Who Gets Started on Kickstarter?

Demographic Variations in Fundraising Success

Research-in-Progress

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Abstract

Crowdfunding platforms like Kickstarter are expected to “democratize” funding by increasing the availability of capital to traditionally underrepresented groups, but there is conflicting evidence about racial disparities in success rates. This paper contributes to the information systems literature on crowdfunding by examining the racial dynamics in the crowdfunding platform Kickstarter. The race of subjects in project and user photos are determined with facial recognition software for 138,778 fundraising projects, and matched sample techniques are used to control for observable differences in project categories among racial groups. Even controlling for these observable differences, this study finds that projects with African-American photo subjects achieve lower success rates. African-American fundraisers also achieve significantly lower success than other groups, and this effect is larger than the effect from project photos. This study has practical implications for individuals seeking capital in these markets as well as design implications for the platforms themselves.

Keywords: Crowdfunding, empirical analysis, diversity
Introduction

Many factors can influence individuals’ successes in seeking and raising capital, including demographics such as gender (Greene et al. 2001, Becker-Blease and Sohlb, 2007). The landscape of fundraising opportunities has shifted with the introduction of crowd-funding platforms, which enable entrepreneurs to broadcast their appeal for investments and potentially attract sufficient capital from a large number of smaller investments. Peer-to-peer crowd-funding platforms like Kickstarter are expected to be an easier source of capital for fledging ventures than the venture capital or financial institutions and are thus expected to “democratize” funding (Marom et al., 2015) by increasing the availability of capital to traditionally underrepresented groups. Access to these platforms is not synonymous with success on these platforms, and there is conflicting evidence regarding whether crowd-funding is actually easier for traditionally underrepresented groups (Barasinska and Schäfer, 2014) or whether the real-world fundraising challenges for traditionally underrepresented groups are also present in crowd-funding platforms (Greenberg and Mollick, 2014). This paper presents evidence that African-Americans, a traditionally underrepresented group in entrepreneurship (Fairlie and Robb, 2008), experience lower success rates with their projects than Whites in crowd-funding platforms. Holding the creator’s race constant, projects with photos of African-Americans also achieve lower fundraising success, although that effect is overshadowed by the disparities in fundraising success rates according to the fundraiser’s race.

This paper contributes to the literature on crowdfunding by examining racial disparities in fundraising success. Prior research on underrepresented groups has focused on how gender influences funding efforts, and there is little research into the effects of race in attracting crowdfunding. The finding that there are racial differences in fundraising success has practical implications for individuals seeking capital in these markets as well as design implications for the platforms themselves. Fundraisers may engage in activities to obscure their race to increase their fundraising success, and platform designers may consider how to obscure race to encourage backers to focus on the content of the project and not its creators.

Theoretical Foundations and Research Questions

Crowdfunding, a relatively recent phenomenon, is defined by the use of technology to broadcast a fundraising message. Success on crowdfunding platforms, defined as achieving the pre-defined fundraising goal, is influenced by many factors including culture (Burch et al. 2015) and demographics (Marom et al., 2015, Radford, 2015).

This study’s central conjecture is that there will be racial disparities in the success rates of crowd-funding projects. The ability to broadcast a funding request in a crowd-funding market enables traditionally underrepresented groups to bypass institutional difficulties in funding; however, discrimination can still emerge as potential contributors receive indications of the fundraiser’s gender and/or race. These indications can emerge in multiple forms—textual cues like the fundraiser's title, e.g., Mr. or Ms., (Radford, 2015) or visual cues such as the fundraiser’s picture (Edelman and Luca, 2013; Chan and Wang, 2014). When this information about the fundraiser’s identity is available, market participants may alter their financial decisions, which would lead to racial disparities in financial outcomes (Radnor, 2015; Edelmen and Luca, 2013).

Crowd-funding platforms often do not explicitly include race as an attribute in the user profile but financial backers could infer race from the fundraiser’s photograph, which contains visual cues of the fundraiser’s race. Crowd-funding platforms often have separate profiles for projects and users so visual cues related to identity can emerge at two levels. First, user profiles often contain the fundraiser’s photo, yielding visual cues about the fundraiser’s identity. Second, pictures associated with the project may contain people and thus contribute racial cues related to the project. These cues are more difficult to interpret because the project’s photo may serve a variety of purposes, e.g., to highlight the team behind the project or to showcase the project’s beneficiaries. The two levels of visual cues provide an identification strategy to differentiate between effects of the user-related racial cues and the project-related racial cues on fundraising success.

There are multiple potential mechanisms for racial disparities in success rates on crowd-funding platforms, and those mechanisms have different implications for project-level photos and creator-level photos.
Racial cues in the user photos

In general, project and fundraiser pictures are likely to influence fundraising success as potential backers may feel a reduced social distance with less anonymity (Charness and Gneezy, 2008). There are multiple potential mechanisms that would lead to racial differences in success rates based on the fundraiser’s race. First, the composition of the contributors may lead to bias in crowd-sourced knowledge (Reagle and Rhue, 2011), and a similar mechanism may lead to biases in crowd-funding. A preference for racial or gender similarity between the backer and the fundraiser—homophily—may influence the fundraising success of underrepresented groups (Ruef et al., 2003). Thus, if the demographics of potential contributors skewed towards a particular race, then the demographics of successful fundraisers would reflect that skew.

Second, there may be bias against African-Americans entrepreneurs, similar to the bias against female entrepreneurs (Brooks et al., 2014) and against minorities in charitable fundraising (List and Price, 2009). Racial bias is present in a number of economic outcomes, including interview call-backs (Bertrand and Mullainathan, 2004) and responses to research requests (Milkman et al., 2015). A bias in crowdfunding opportunities reduces the available capital source for African-American entrepreneurs, who are half as likely as White Americans to own their own business (Fairlie and Robb, 2008). Multiple mechanisms both predict that the fundraiser’s race will shape differences in success rates. Therefore, it is hypothesized that

H1. African-American fundraisers experience a lower success rate than other fundraisers.

Although an African-Americans fundraiser may include a picture of him/herself as the project creator, the photo associated with the project might not indicate his/her racial identity. The theory that connects the project photos with the identity characteristics is discussed in the next subsection.

Racial cues in the project photos

The photos associated with crowd-funding projects may serve a variety of purposes, e.g., to showcase the team behind the project, to highlight the target customers, to display the project logo, etc. Thus, any racial cues in the project photos do not necessarily reflect the racial category of the fundraiser. For example, a White fundraiser may propose starting a charity that primarily benefits African-American students and may include an image of those beneficiaries in the project photo. In that instance, there is a dissonance between the racial cues in the project photos and in the fundraiser profile, and this dissonance enables the comparison of success rates by fundraiser and by project photos. There are multiple mechanisms that would result in racial disparities in the success rates based on the racial cues of the projects, discussed below. Racial disparities based on project photos would suggest that elements of the project photo shape backers financial contribution decisions and not necessarily the fundraiser’s race. Still, it is expected that visual cues of race, similar to text cues of gender (Radford, 2015), will decrease success in a crowdfunding setting. Investors may have preferences for projects associated with in-group members, similar to the homophily for fundraisers (Ruef et al., 2003). Alternatively, there may be a bias against projects that benefit minorities (Jenq et al., 2015), which would also result in racial disparities of success as the races represented in the project photos would reflect the skewed demographics of the backers. It is hypothesized that

H2. African-American subjects in projects’ photos will be associated with decreased fundraising success rates.

Identification

The presence of project and user photos creates an identification strategy to determine the effect of project-related racial cues as compared to creator-related racial cues. The relative magnitude of the differences in success rate can be considered by investigating the projects in which the race(s) of the individuals in the project photo do not align with the race of the fundraiser. This study hypothesizes that

H3. There will be racial disparities in success rates for project photos and user profile photos, and projects with African-American fundraisers and African-African project photos will experience the lowest success rates.
By identifying projects with misalignment between the fundraiser’s race and the race of the project photo’s subjects, we can distinguish between bias towards the fundraisers and bias towards projects that promote or benefit a racial category.

**Empirical Analysis**

Kickstarter, a popular crowd-funding platform, is used to investigate the racial disparities in success rates outlined in the above hypotheses. Kickstarter enables entrepreneurs to connect with small investors to achieve a pre-defined capital goal.

**Background and Data**

The dataset, downloaded from WeRobots.io, contains over 193,000 records of the entire project list on Kickstarter in December 2014. It contains extensive background information on the projects and their fundraisers. Each project has a name, text description, fundraising goal amount, actual amount of capital raised, project status at the time of the web crawl, project-related picture, category, and location. Each fundraiser’s profile has a name, brief description, and biographical photo. Both types of data—project and fundraiser—are employed in the analysis.

**Variable Construction**

For each project, several readily available variables are used in the analysis: Project Category, Goal, Backers Count, Success, Launched Year, and Launched Day of the Week. Project Category classifies the project into one of fifteen high-level categories, and indicator variables for each category are used in the regressions. Goal is the amount of capital that the fundraisers were trying to raise, and Success is a binary variable that indicates whether the fundraiser achieved his/her goal. Backers Count is the number of backers who contribute to the project. Launched Year and Launched Day of the Week are the year and the day-of-the-week (e.g., Monday) respectively that the project was launched, and these variables are included to control for changes in project success rate over time.

The two pictures associated with each project, the fundraiser photo and the project photo, are categorized using the FacePlusPlus application to identify 1) whether the picture contains faces, 2) if the subjects(s) are smiling, 3) the subjects’ gender(s), 4) the subjects’ races, and 5) the estimated age of the subjects. Thus, the following variables are constructed with the FacePlusPlus application: NumberOfFaces—the number of faces in the pictures, Smiling—the degree to which the subjects were smiling, Average Age—the average estimated age of the subjects in the photo, Gender—indicator variables for whether a male or female is in the picture, and Race—indicator variables for whether there is a Black, White or Asian subject in the picture. These categories are not mutually exclusive.

Thus, the fundraiser’s race is operationalized as the perceived race identified using the facial recognition software, which recognizes White, Black, and Asian faces. With this operationalization, a gap may exist between a subject’s perceived race and his/her self-identified race; however, this study focuses on fundraising success based on racial perception. Facial recognition software mimics the process of racial categorization that is based on visual cues; therefore, it is consistent with the theoretical constructs on race.

There were a few important restrictions placed on the dataset. First, because this study examines the outcome of the projects, only projects with known outcomes—either success or failure—are included; projects that were still soliciting donations at the time of the web crawl were omitted. Second, some projects and/or the associated fundraiser profiles did not allow for their pictures to be accessed and/or categorized based on privacy settings and those projects are excluded from the analysis. The dataset comprised 138,778 projects with those two exclusions.

**Summary Statistics**

The summary statistics shown in Table 1 indicate a few important characteristics about the data. About 40% of projects are successful so there is a relatively high success rate overall. Roughly 50% of the projects have pictures with identifiable faces and the majority of those faces are identified as White. Of all projects, 2.4% of project photos and 3.1% of fundraiser photos have identifiably African-American faces.
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<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal ($)</td>
<td>28106</td>
<td>710601</td>
</tr>
<tr>
<td>Success (%)</td>
<td>0.40</td>
<td>0.49</td>
</tr>
<tr>
<td>Backers (#)</td>
<td>113</td>
<td>889</td>
</tr>
<tr>
<td>Number of Faces in Fundraiser Photos</td>
<td>0.52</td>
<td>0.65</td>
</tr>
<tr>
<td>Smiling Index for Fundraiser Photos</td>
<td>27.62</td>
<td>46.10</td>
</tr>
<tr>
<td>Male Fundraisers (%)</td>
<td>0.31</td>
<td>0.46</td>
</tr>
<tr>
<td>Female Fundraisers (%)</td>
<td>0.18</td>
<td>0.38</td>
</tr>
<tr>
<td>White Fundraisers (%)</td>
<td>0.39</td>
<td>0.49</td>
</tr>
<tr>
<td>Black Fundraisers (%)</td>
<td>0.032</td>
<td>0.175</td>
</tr>
<tr>
<td>Asian Fundraisers (%)</td>
<td>0.045</td>
<td>0.21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Faces in Project Photos</td>
<td>0.38</td>
<td>1.2</td>
</tr>
<tr>
<td>Smiling Index for Project Photos</td>
<td>13.78</td>
<td>62.72</td>
</tr>
<tr>
<td>Males in Project Photos (%)</td>
<td>0.20</td>
<td>0.73</td>
</tr>
<tr>
<td>Female in Project Photos (%)</td>
<td>0.16</td>
<td>0.67</td>
</tr>
<tr>
<td>White in Project Photos (%)</td>
<td>0.16</td>
<td>0.37</td>
</tr>
<tr>
<td>Black in Project Photos (%)</td>
<td>0.023</td>
<td>0.15</td>
</tr>
<tr>
<td>Asian in Project Photos (%)</td>
<td>0.038</td>
<td>0.19</td>
</tr>
</tbody>
</table>

\( N = 138,778 \)

**Table 1. Summary Statistics for the Dataset**

In addition, as expected, there are racial differences in the project distribution. Figure 1 shows the breakdown of percentage of all projects by project category for African-American and non-African-American fundraisers. Film and Video is the largest category for African-American and non-African-American fundraisers, although the category comprises nearly 30% of the Kickstarter projects for African-American fundraisers. Music, publishing, and fashion are also more popular with African-American fundraisers than non-African-American fundraisers. Conversely, three categories—art, games, and technology—are more popular with non-African-American fundraisers. This observation of the racial differences in project distribution supports the future investigation into the intersection of racial prescriptions, fundraising efforts, and success rates similar to that of Greenberg and Mollick (2014).

**Figure 1. Distribution of Project Categories by Creator Race**

The following section describes the methodology used to examine the effects of race—both the fundraiser’s race and the racial cues of the project.
Methodology

The goal of this research is to understand the effect of race in crowdfunding efforts. In particular, this research examines how the inclusion of African-American subjects in the project photos and/or fundraiser photos shapes success rates. Because race is invariant, the challenge is to control for the systematic differences between projects with African-American and without African-American subjects. The identification strategy is to create a matched sample of the projects with photos of at least one African-American subject with projects that have no African-American subjects. This identification strategy eliminates the alternative explanation that projects with African-American subjects systematically differ on observable characteristics. Two techniques are used to create a matched dataset: Coarsened Exact Matching (CEM) and Propensity Score Matching (PSM). Coarsened Exact Matching techniques match the covariates of the treated group with that of the untreated group using “bins” for the variables (Blackwell et al., 2009). Propensity Score Matching (PSM) techniques would match the projects based on the propensity to be in the treatment group, i.e., the propensity to be projects with African-American photo subject, based on the matching covariates (Sekhon, 2011). The following dimensions were the covariates used to create the matched dataset: Goal, Project Category, Launched Year, Launched Day of the Week, Number of Faces, Smiling, Average Age, and Gender. Plus, there were controls for whether the project photo’s contained White or Asian subjects.

The CEM and PSM matched datasets are both used to estimate the success rate of projects and evaluate the average treatment. The coefficient estimates for the matched datasets are compared to the estimates for the logistic regression model on unmatched dataset:

\[
\text{Success} = \text{Treatment} + \text{Project Covariates}
\]

Where Success is an indicator of project success, the Treatment is whether the project photo has an African-American subject, and the covariates are the variables described above: Goal, Project Category, Launched Year, Launched Day of the Week, Number of Faces, Smiling, Average Age, and Gender.

Results

Success Rates by Subjects of the Project Photo

The treatment effects of African-American subjects in project photos were estimated using the matched datasets to evaluate H2. Across multiple methods of controlling the observable characteristics, the results consistently suggest that the projects with African-American subjects in the photos are consistently less successful than projects without African-American subjects.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Unmatched (I)</th>
<th>CEM (II)</th>
<th>PSM (III)</th>
</tr>
</thead>
<tbody>
<tr>
<td>African-American Subjects in Project Photos</td>
<td>-0.496 (0.0534)***</td>
<td>-0.500***</td>
<td>-0.209 (0.0122)***</td>
</tr>
</tbody>
</table>

Table 2. Treatment Effect for African-Americans in Project Photos

The estimates suggest that the inclusion of a Black subject in the project photo is associated with a 60% to 82% decrease in the odds of success.

Success Rates by Subjects in the Fundraiser and Project Photos

Next, projects with dissonance between the race of the two photos, project and fundraiser, are examined to better understand whether this disparity in success outcomes is driven by a bias against African-American
fundraisers or a bias against projects with references to African-Americans. Projects are placed into one of four categories by the visual cues in their project and creator photos, as shown in Table 3.

<table>
<thead>
<tr>
<th>Project Photos</th>
<th>Creator Photos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-African-American</td>
<td>Group 1</td>
</tr>
<tr>
<td>African-American</td>
<td>Group 3</td>
</tr>
</tbody>
</table>

**Table 3. Project Categories**

The success rates are calculated for each group, and Groups 2 and 3 are particularly interesting because there is not alignment between the racial categories of the fundraiser and the subjects of the projects’ photo. It is expected that Group 1 will have the highest success rate, Group 4 will have the lowest success rate, and the success rates for Groups 2 and 3 will fall in between those values. Figure 2 shows the success rate by those four groups with error bars for the standard error.

![Figure 2. Average Success Rates](image)

A simple comparison across categories indicates that the success rates are highest for Group 1. Non-African-American who sponsor projects with African-American subjects in the photos (Group 3) experience a lower success rate than those without African-American subjects (Group 1). African-American fundraisers have significantly lower funding rates, whether the project photo contains at least one identifiable African-American faces (Group 4) or not (Group 2), and their success rates are significantly lower than those of non-African-Americans (Groups 1 and 3). This comparison indicates the lower success rates are driven by race of the fundraiser, not the races of the subjects in the project photos.

The simple graphical comparison above does not control for systematic variations of project category and other project attributes that might explain the variation in success rate among these groups. A logistic regression is estimated to examine the differences in success rates among these categories while controlling for the fundraiser and project characteristics. The logistic regression uses the following model:

\[
\text{Success} = \text{Group} + \text{Fundraiser covariates} + \text{Project covariates}
\]
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Where Group is the collection of indicator variables for Group1, Group2, Group3, and Group4; Fundraiser covariates are the Race, Gender, and Average of the fundraiser; Project covariates include the Goal, Project Category, and Launched Year of the project.

In addition to the success rate, racial categories may influence the ability of creators to attract interest from multiple backers. Therefore, a similar model investigates how these categories affect the backers by estimating the linear model:

\[
\text{Backers Count} = \text{Group} + \text{Fundraiser covariates} + \text{Project covariates}
\]

Where Backers Count is the number of contributors to the project, and fundraiser and project covariates are the same as in the previous model.

The estimated coefficients, shown in Table 4, provide support for both H1 and H3. In both models African-American fundraisers experience decreased success and produce fewer backers (H1), even controlling for the fundraiser and project covariates described above. The negative coefficient estimates for Groups 2-4 indicate that projects with an African-American either in the picture or as the fundraiser all experience a lower success rate than Group 1 and a reduced ability to attract backers, even controlling for observable characteristics like project category (H3).

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Success Indicator (IV) Estimate</th>
<th>Backers Count (V) Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 2</td>
<td>-0.934 (0.048)***</td>
<td>-0.190 (0.010)***</td>
</tr>
<tr>
<td>Group 3</td>
<td>-0.403(0.053)***</td>
<td>-0.092 (0.011)***</td>
</tr>
<tr>
<td>Group 4</td>
<td>-1.008 (0.032)***</td>
<td>-0.203 (0.022)***</td>
</tr>
<tr>
<td>Fundraiser Covariates</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Project Covariates</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>AIC</td>
<td>171,323</td>
<td>187,990</td>
</tr>
</tbody>
</table>

*** denotes p-values < 0.001

Table 4. Coefficient Estimates for Racial Alignment in Project / Fundraiser Photos

Group 2 projects maintain success rates on par with those in Group 4, suggesting that the race of the fundraiser drives the lower success rate, not the race of the subjects in the project photo. This result provides evidence that the success in attaining capital is lower for identifiably African-American fundraisers on crowdfunding platforms, despite any observable racial differences in the distribution of project categories.

Discussion

This research-in-progress paper begins the examination of racial disparities in successful fundraising on crowdfunding platform by investigating Kickstarter, one of the largest and most well-known platforms. The research hypotheses investigate how race affects both the success rate and the ability to attract backers. There is initial support for the conjecture that African-American fundraisers experience lower success in capital-raising efforts on crowdfunding platforms, and this research employs multiple techniques to isolate fundraiser races from other confounding factors.

This research-in-progress will continue by exploring several different avenues. First, it will continue to examine racial disparities in fundraising success by performing a similar analysis on Asian fundraisers to gauge if there is a similar decrease in success rates for Asians. In addition, the study will examine whether diversity, measured as the Gini coefficient (Oestreicher-Singer and Sundararajan, 2012), influences success metrics. Second, this study will examine how the societal expectations related to race affect the success rate of various projects. Research about gender in online platforms indicate that women experience higher success in non-stereotypical fields (Greenberg and Mollick, 2014) but lower success in other fields (Radford 2015). Perhaps the alignment between racial prescriptions (Akerlof and Kranton, 2001) and fundraising project category accounts for some of the lower success. Third, the racial disparities in fundraising success may be explained by systematic racial disparities in the projects such as linguistic differences (Gorbatai and Nelson, 2015) or project categories based on racial prescriptions (Benjamin et al., 2010). A more robust
textual analysis of the projects is slated to understand the sentiment of the projects and whether that differs by race. For example, are African-American fundraisers more prone to negative emotions in their project descriptions, and those negative emotions are decreasing the attractiveness of their projects? If the matched sample can also account for differences in the project’s tone, then it would strengthen any findings about the effect of race on fundraising success.

There are multiple limitations to this study. First, the results rely on the accuracy of the facial recognition software, so a next step is to verify the alignment between the human perceived race and the automatic classification. Second, there are no controls for the alignment between the project category and the racial prescription. Behavioral prescriptions related to identity (Akerlof and Kranton, 2010; Akerlof and Kranton, 2000) may influence backers’ preference for projects by particular entrepreneurs in particular demographics (Mollick, 2013).

Crowdfunding platforms are supposed to “democratize” funding; however, fundraisers may encounter similar bias in the online world as in the offline world as crowdsourcing platforms become more visual and provide more context. If visual cues about race reduce the probability of success, some fundraisers may choose to omit their pictures to broaden their appeal and increase their chance of success. Also, crowdfunding platforms could choose to omit certain identifying characteristics such as gender and race, like the platform Prosper, so that potential backers are forced to judge the project’s worthiness on its characteristics. Thus, the dynamics of race in crowdfunding platforms have implications for the fundraisers and for the platforms. This research contributes to the information systems literature by beginning this investigation.
References


WeRobots.io Available at: [http://werobots.io/kickstarter-datasets/](http://werobots.io/kickstarter-datasets/)