

The Influence of Seed Donation in Multiple Public Goods Setting: Evidence from Kitabisa

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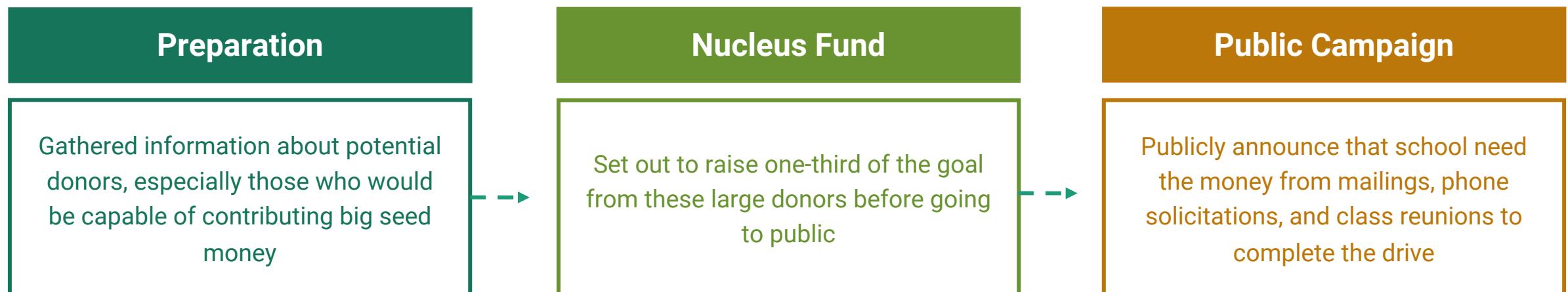


Research Background



Initial seed is proven as a successful mechanism to fund many capital campaigns

Wisconsin Governor in 1995 offered \$27 million to finance a new \$72 million basketball arena for the University of Wisconsin, on the condition that the rest of the money be raised by private. Thus, the school...



As the school successfully collected all the money needed less than a year,
Initial seed is proven as a successful mechanism to fund many capital campaigns

Andreoni (1998) develops a positive theory of capital campaigns by seeding initial donation

Individual Supply Function to the Charity

$$g_i = \max\{f_i(m_i + G_{-i}) - G_{-i}, 0\}.$$

- m_i : initial endowment (personal consumption x_i or public goods g_i)
- G_i : total contribution to the public goods

Function for Utility Maximization

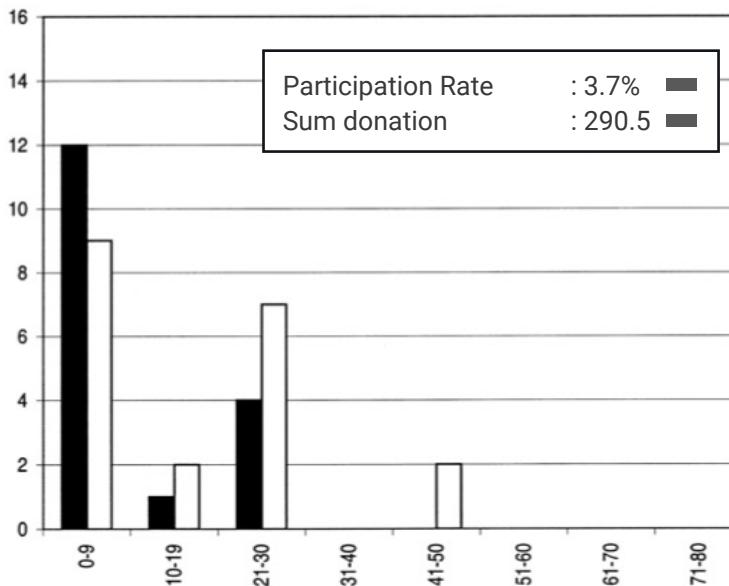
$$u_i(m_i + \tau_i - \bar{G}, \bar{G}) \equiv u_i(m_i, 0),$$

- τ_i : amount of exogenous giving at which person i is just willing to bring the public good up to the threshold value by acting alone

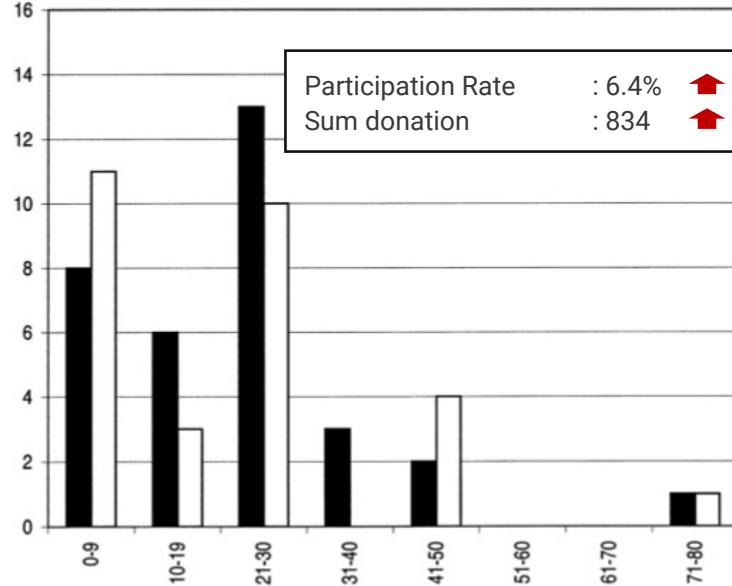
From previous study*, donation and participation rate increased as the level of seed money increased

Amount of Donation (in Dollar) to Number of People Who Make Donation

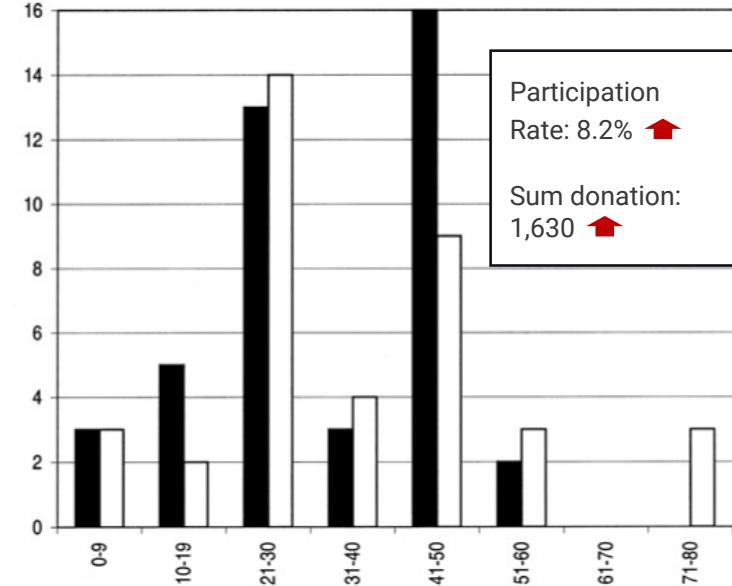
10-percent Seed Money



33-percent Seed Money



67-percent Seed Money

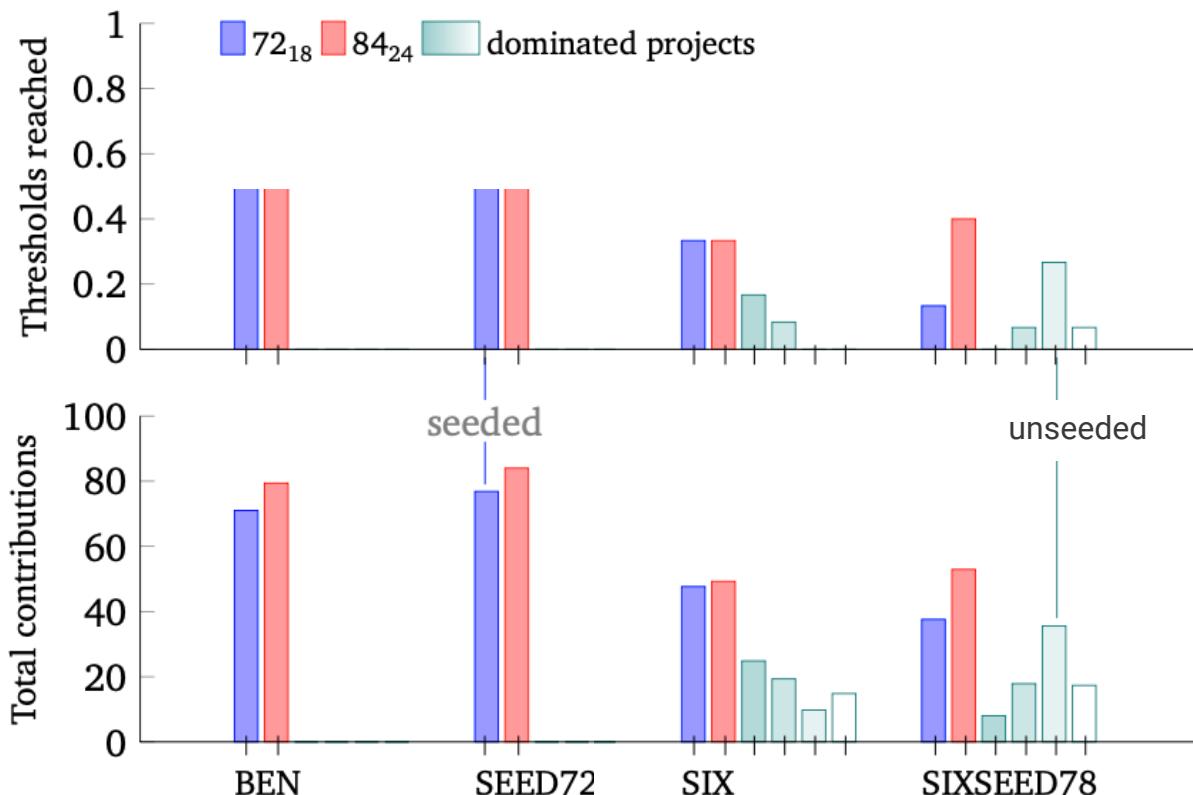


■ : with Refund
□ : without Refund

The absolute number of **small donations decreases as the seed money increases**, shown by only six small gifts (under \$10 each) at the 67 percent seed level. Compared to 21 at the 10%-seed level and 19 at the 33%-seed level,

Another study* shows that in multiple public goods, seed donation also increase total contribution

Average Number of Thresholds Reached and Total Contributions Across Treatments



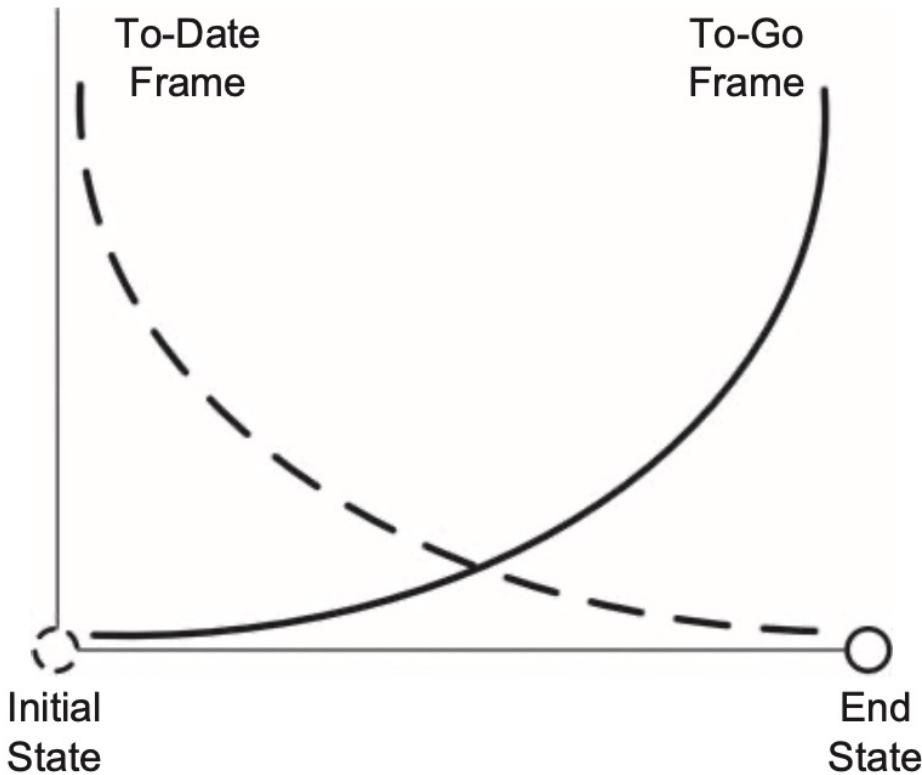
Treatment	Code	Project Characteristics**
Benchmark	BEN	72 ₁₈ , 84 ₂₄
2 Public Goods with Seed Money	SEED72	<u>92</u> ₁₈ , 84 ₂₄
6 Public Goods	SIX	72 ₁₈ , 84 ₂₄ , 74 ₁₆ , 78 ₁₇ , 86 ₂₂ , 90 ₂₃
6 Public Goods with Seed Money	SIXSEED78	72 ₁₈ , 84 ₂₄ , 74 ₁₆ , <u>98</u> ₁₇ , 86 ₂₂ , 90 ₂₃

- While increasing the overall contributions, number of projects available decreased the number of projects that reached the threshold
- Seed doesn't significantly increase the success of project in the treatment where there are only 2 public goods
- The effect of seed money becomes stronger when there are multiple public goods

*Study by Ansink et al. (2017). The figures and data are truncated, thus only showing related study for seed money. **The number on the table shows the project's threshold, while the subscript is the pay-off of the project. The underline shows seeded money project: only for the project that gives the least pay-off to the participants by 20, then increase threshold by 20, making it equivalent to their benchmark counterpart

From psychology, a research* shows the way people perceive value of progress affects motivation

Distance From Standard of Reference (Initial State vs. End State) for Motivation



- Stuck in the middle theory
- **Motivation decreases** monotonically when an actor monitors progress relative to the initial state (to-date frame),
- On the other hand, **motivation increases** monotonically when an actor monitors progress relative to the end state (to-go frame)
- Thus, it shapes a U-curve

I am interested in studying whether the seed money effect still holds in a more realistic world situation

Research Question

Does seeding a campaign will still be effective in a situation where there are multiple public goods shown to donors at one time?

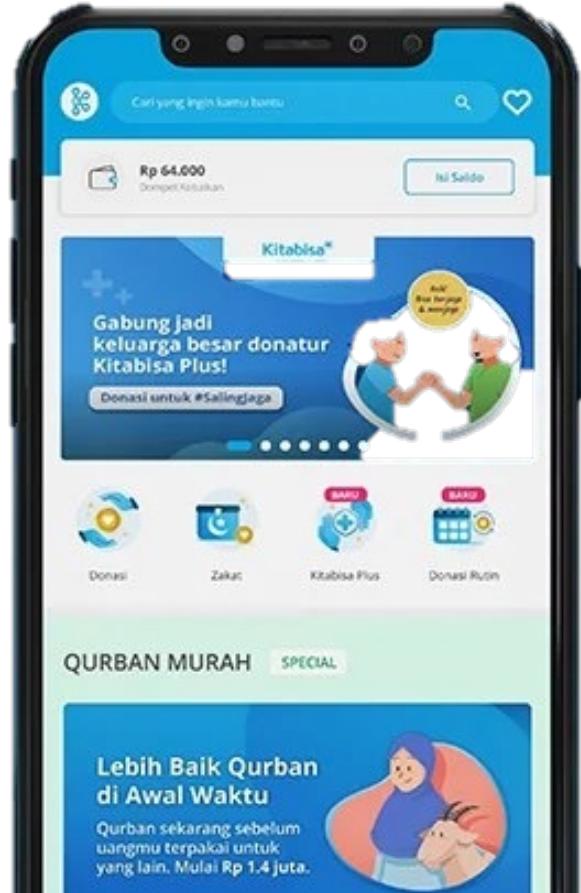
What to do for research?

Observing the effect in Kitabisa, one of the crowdfunding platforms in Indonesia, where **there are multiple campaigns with different initial seed.**

Data and Methodology



Kitabisa, one of the most Indonesia's most popular fundraising for the main object of the research



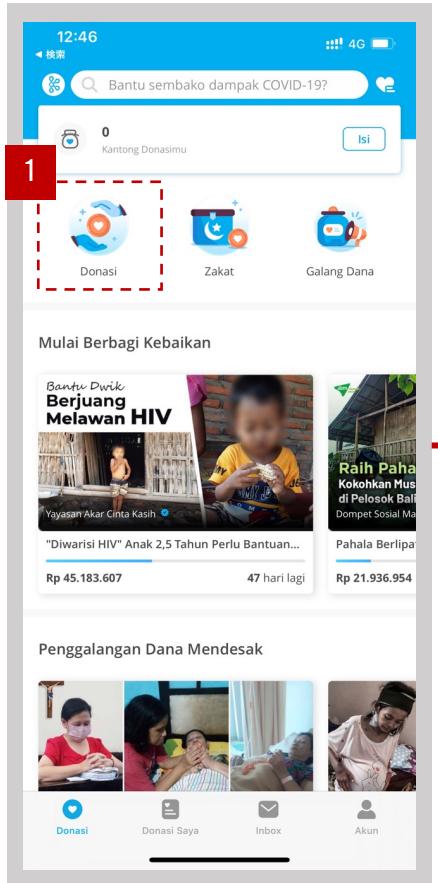
Kitabisa is one of the most famous online platform in Indonesia to gather capital through fundraising. They have website and mobile application for it. Since 2013, they have facilitated more than 6 Million donors, 100,000 campaigns, and hundreds of NGOs and CSRs.

Facts about Kitabisa:

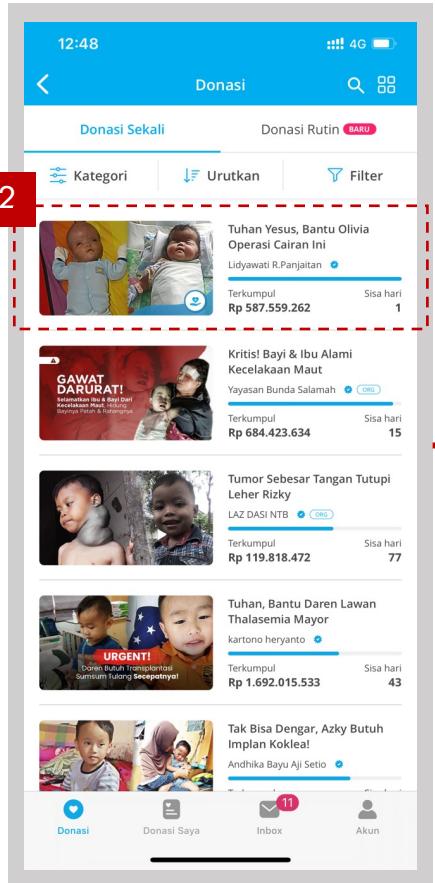
- Everyone can make a fundraising there, just like a social media for fundraising.
- They charge an administrative fee (5%) from the total collected donations to fundraisers, except for the categories of natural disasters and zakat.
- Even though the campaign doesn't meet their target, the donation will not be refunded to the donors.
- Organizer can extend their campaign deadline after it's done.

One of many funnels that people will go through when trying to donate in Kitabisa

Main Page



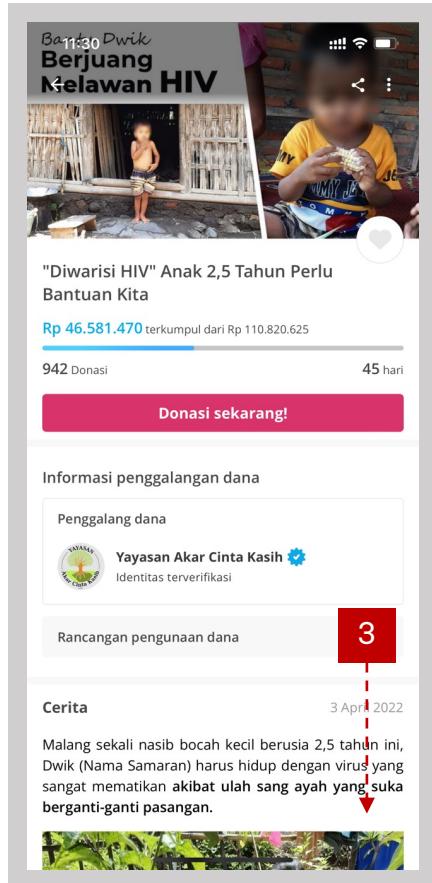
Campaign List Page



Click (1) to open campaign list page

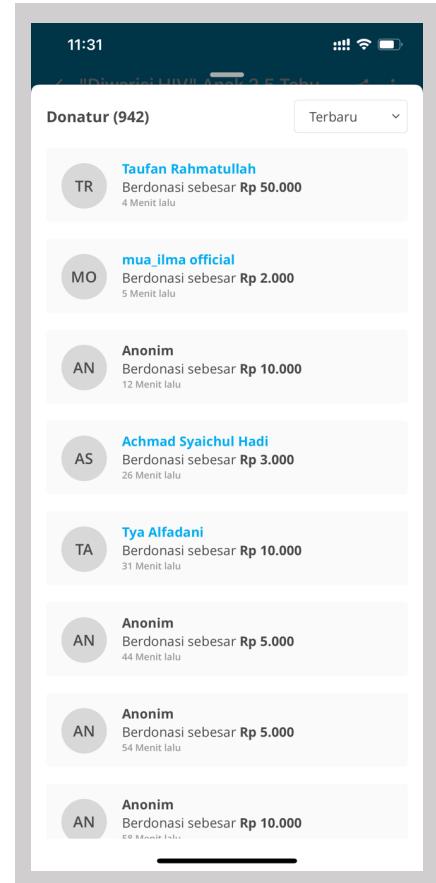
Choose desired campaign, and click (2) to navigate to campaign page

ex. Campaign Info

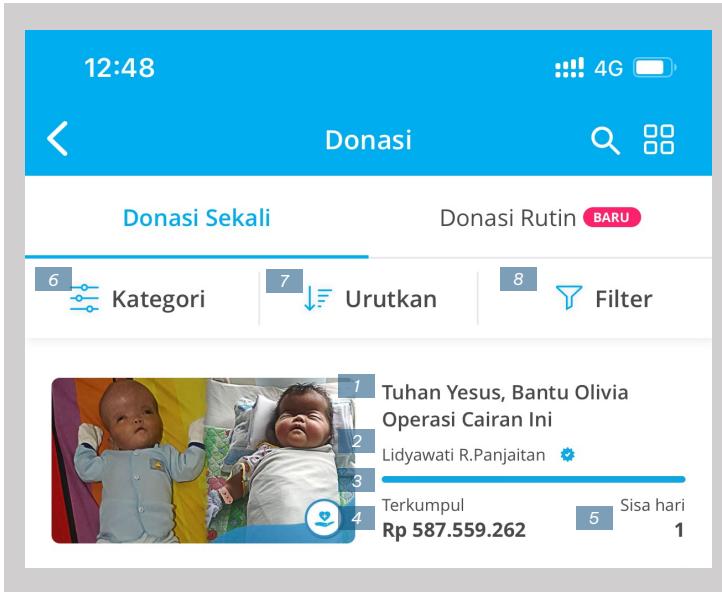


Scroll down (3), and we can see the list of donors and their donations

Donation List



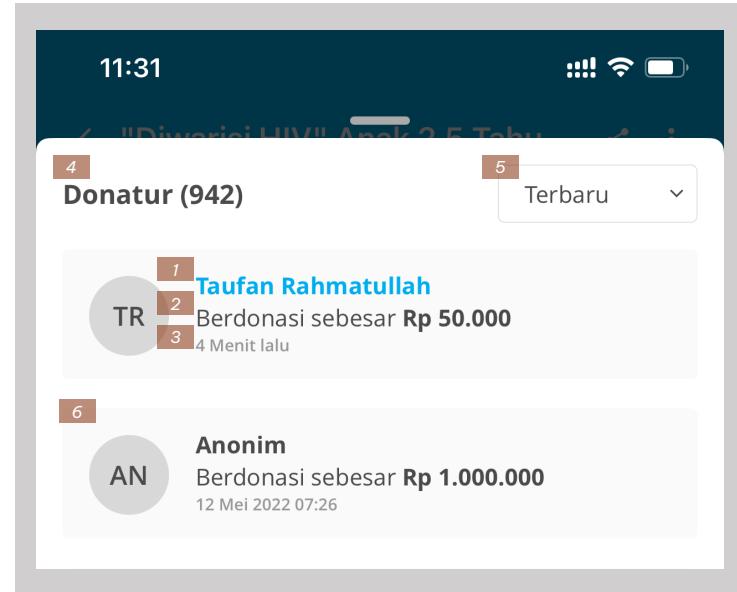
From this funnel, there are several important variables I collected for this research, including...



1. Title of the campaign
2. Organizer of the campaign (with verification badge on the right)
3. Progress bar (shown, it's completed)
4. Amount of money gathered
5. Days remaining
6. Filter campaigns by category
7. Sort campaign the latest, or the most urgent
8. Filter campaigns by criteria

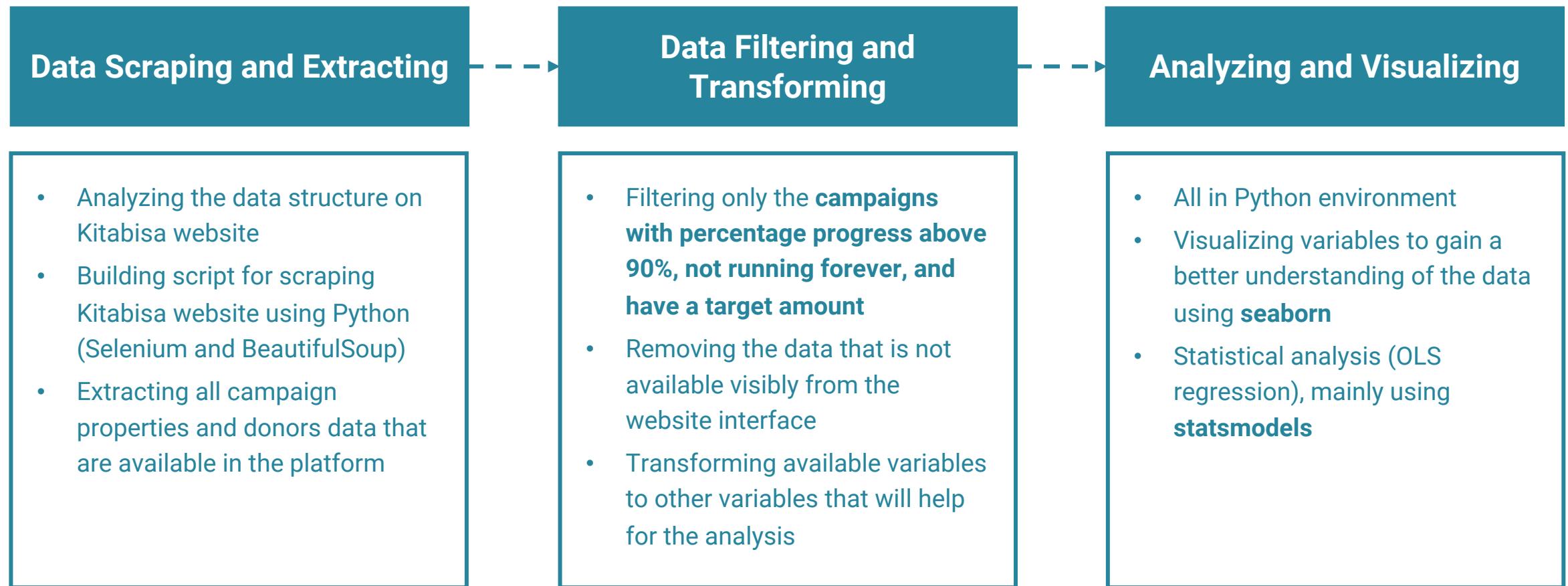


1. Title of the donation
2. Amount of money gathered
3. Target amount of the campaign
4. Progress bar (shown, it's around 50% completed)
5. Number of donations made
6. Days remaining
7. Campaign properties (campaigner, verified or not, latest update of the donation, and many more)



1. Name of the donor
2. Amount of donation
3. Timestamp (in format of how many minutes has been passed from now)
4. Number of donation
5. Sort by the latest or the biggest amount
6. Example of donor who chose to be anonymous

From these journey, there are many variables I collected for this research, including...



From the scraping, I got 1,376 campaigns with total donations of 17,070,348 that I filtered again to...

Initial sample

Pooled data from Sep 27 - Oct 24, 2022

1,376 campaigns

Number of donations

17,070,348

Amount donated

IDR 502 bil.

- Percentage progress above 90%
- Campaign doesn't run forever
- Have a defined target amount
- Number of donations below 500,000

Final sample

Filtered by criterion*

54 campaigns

Number of donations

1,354,060

Amount donated

IDR 32 bil.

Transforming available data into the other meaningful variables to conduct the analysis

Percentage Progress

Percentage progress of the campaign when donation was made. Dividing the cumulative sum of campaign by amount of donation received.

Progress Bin

Splitting percentage progress into 10 bins + 1 bin. Every bin shows 10% incremental to the progress. Every donation is put into bin based on the percentage when the donation was made.

Bin Duration

Duration to complete each bin, calculated in days.

Duration to Previous Donation

Timestamp of the donation, subtracted by $(t-1)$. Calculated in seconds.

Days Threshold

Categorizing by the day has been passed since the campaign started to control the possibility of the organizer of the campaign extends the campaign deadline. Threshold is set at 365 days.

From three foundations, Hypothesis 1 predicts the correlation of seed donation and participation rate

Seed donation may promote signaling of to other donors thus increasing participation rate and amount

Found by Several Studies*

In multiple public goods with seed donation, because too many options, people may pay attention to seed as a simple default

Ansink et al. (2017)

Motivation of goal pursuit can be highest only in the middle (U-curve) based on perceived marginal value of progress

Bonezzi et al. (2012)



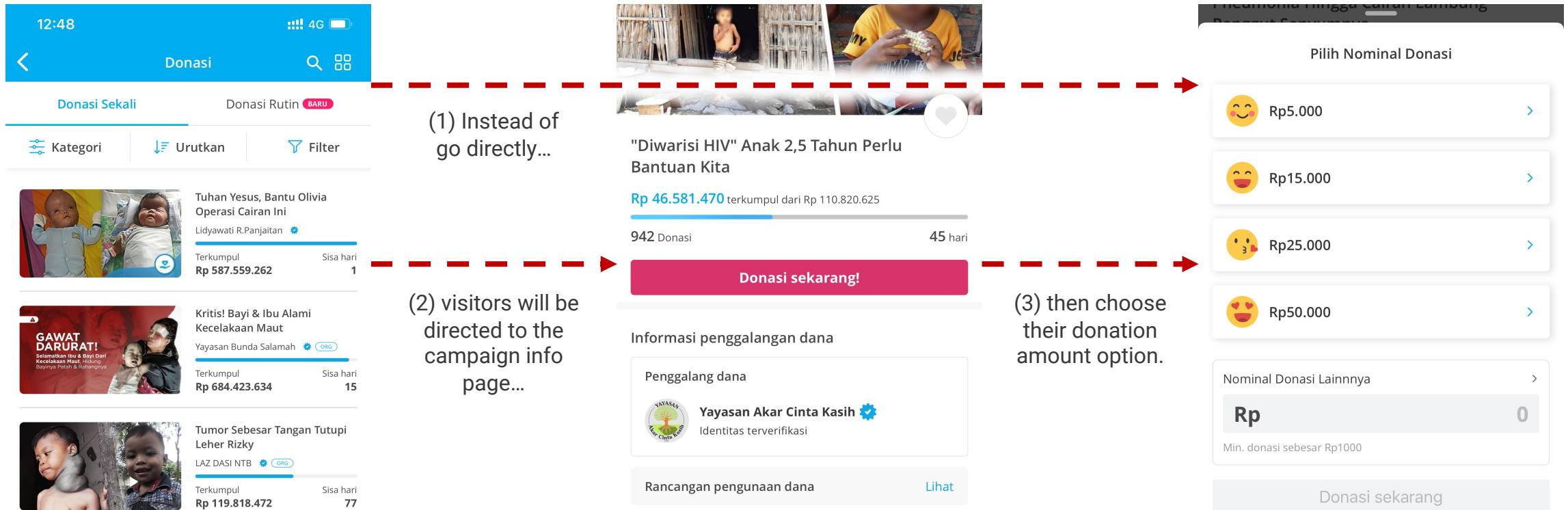
$$bin_duration_j = \beta_0 + \beta_1 progress_bin_j + \beta_2 progress_bin_j^2 + (control) + \epsilon \dots (1)$$

(1) As more money is donated, it will take less time to fill up each progress bin; but at some point, it will take longer again.

$$dur_to_prev_donation_{ij} = \beta_0 + \beta_1 percentage_progress_{ij} + \beta_2 percentage_progress_{ij}^2 + (control) + \epsilon \dots (2)$$

(2) The duration from previous donation will initially be long, but as the percentage rises, it will gradually get shorter. At some point it will eventually lengthen once more.

On the other hand, Hypothesis 2 predicts that amount of donation won't be affected by seed donation



Visitors will have plenty time to learn more about the campaign, thus visitors might be exposed with other variables*. Therefore, I don't expect there will be any correlation between seed money and amount of donation.

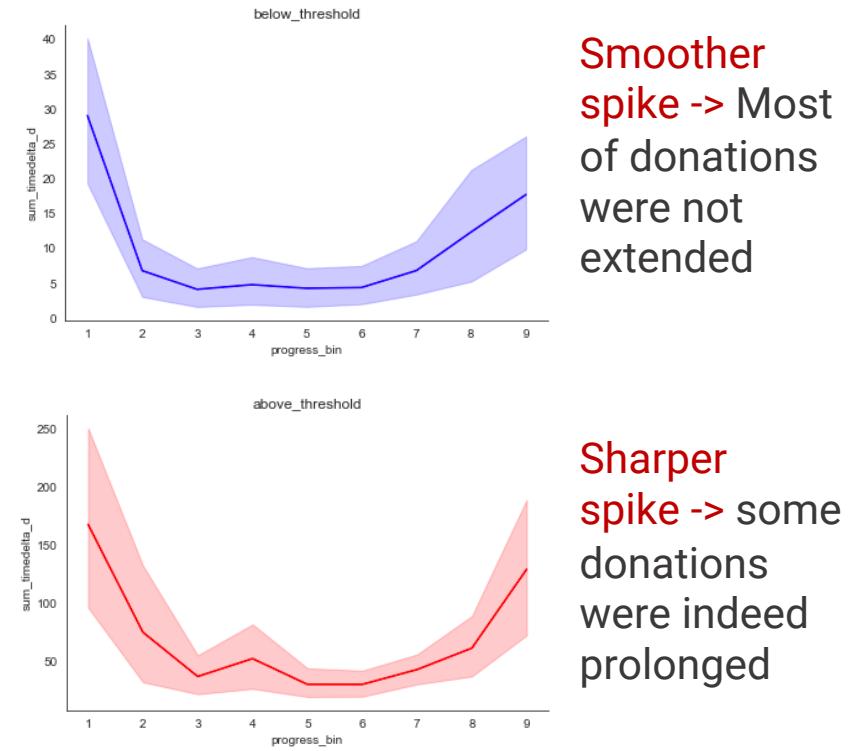
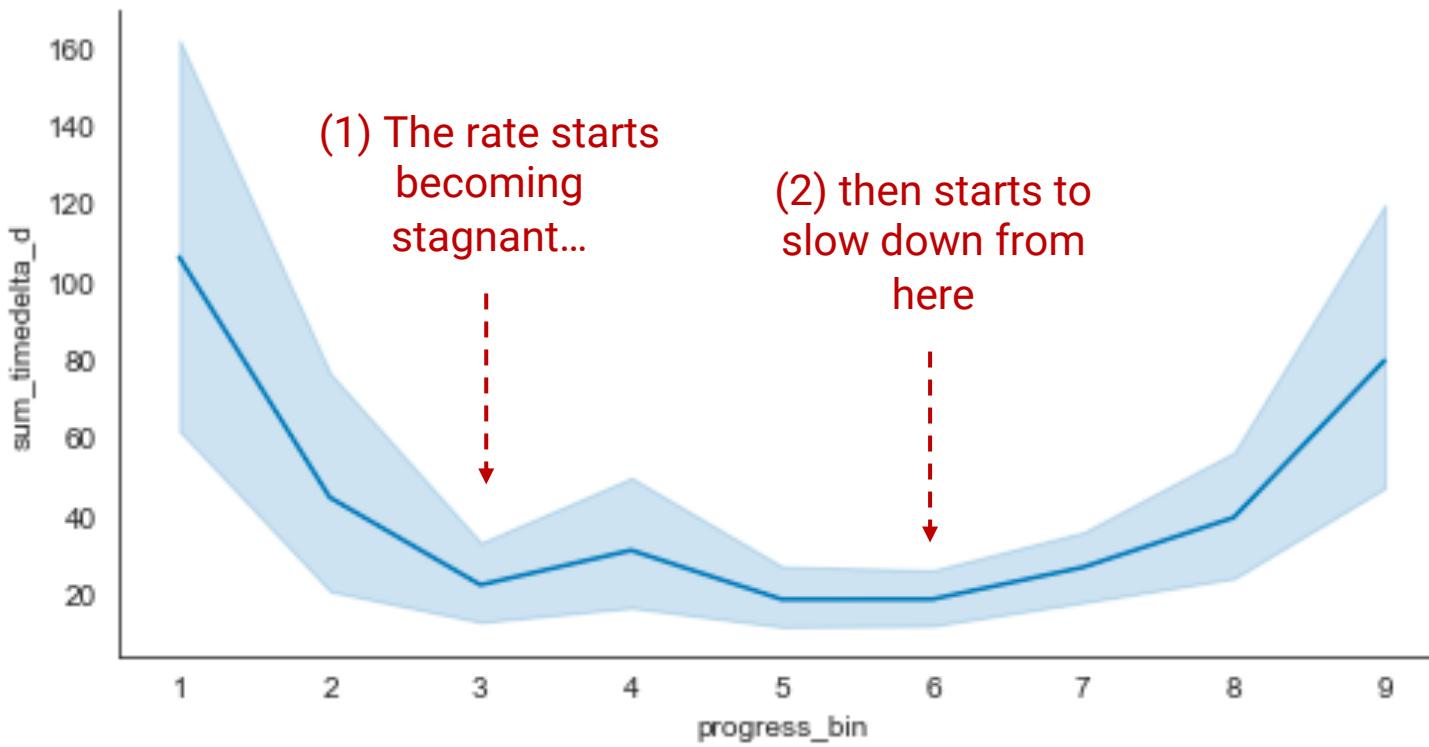
*These variables include photo of target, storytelling, etc. thus influenced their donation behavior (Basil et al., 2008; Bennett, 2003; Sargeant et al., 2004; Small & Simonsohn, 2008)

Result and Discussion



The progress bin finished faster until the 3rd, but started to slow down again after 6th

Average Days to Complete Every Bin in Pooled (Left) and Days Category (Right)



The polynomial model of progress bin significantly explains the duration to complete each bin

Polynomial Regression of Progress Bin to the Duration Completion of the Bin (in Days)

Green table for Pooled OLS Regression while Orange table for Regression with Fixed Effect of Campaign

	Pooled Data	Below Threshold	Above Threshold	Pooled Data	Below Threshold	Above Threshold
Progress Bin	1 -47.389***	-12.476***	-75.319***	-47.389***	-12.476***	-75.319***
Progress Bin ²	4.530***	1.208***	7.188***	4.530***	1.208***	7.188***
Observations	486	216	270	486	216	270
Adj. R ²	2 0.074	0.170	0.116	0.269	0.400	0.232

- (1) The shortest point where the bin is completed is at bin 5 (52.31% for pooled data and 51.64% for below threshold)
- (2) After including Fixed Effect, the adjusted R-squared jumped by almost a factor of four for all models

After controlling other variables, progress bin is still the most significant variables in the model

Variables	Pooled Data	Below Threshold	Above Threshold
Progress Bin	1 -47.389***	-12.476***	-75.319***
Progress Bin ²		4.5304***	1.208***
Days Category: Below Threshold			-54.549***
Campaigner Type: Personal	3.736	0.717	-4.576
Verified: True	29.545**	-0.827	69.290**
Donation Target	0.000	0.000**	0.000
Observations	486	216	270
Adj. R ²	2 0.241	0.370	0.210

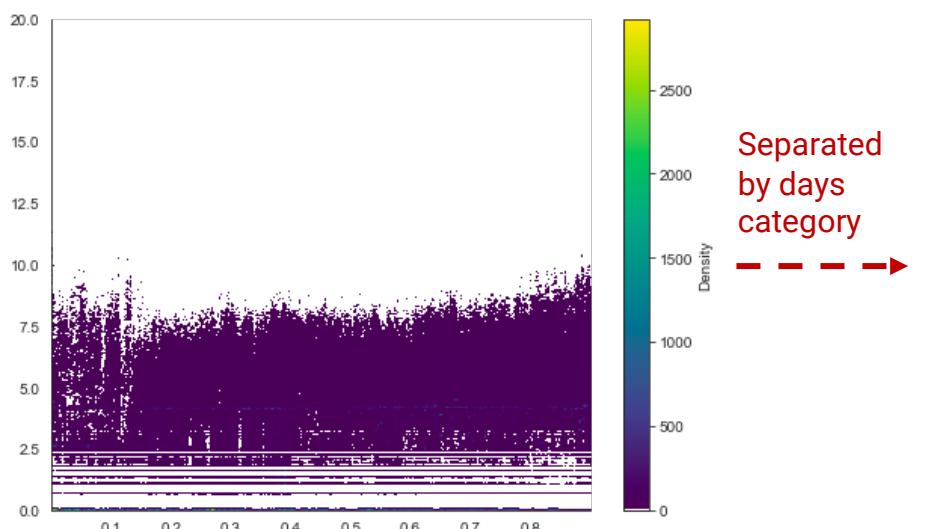
Regression of All Variables Listed to the Duration Completion in Days

- (1) Coefficients for main interest of this study does not change at all, and are the most significant variables
- (2) Adjusted R-squared is slightly lower than it was for the fixed effect regression, showing that the fixed effect model did already explain campaign characteristics

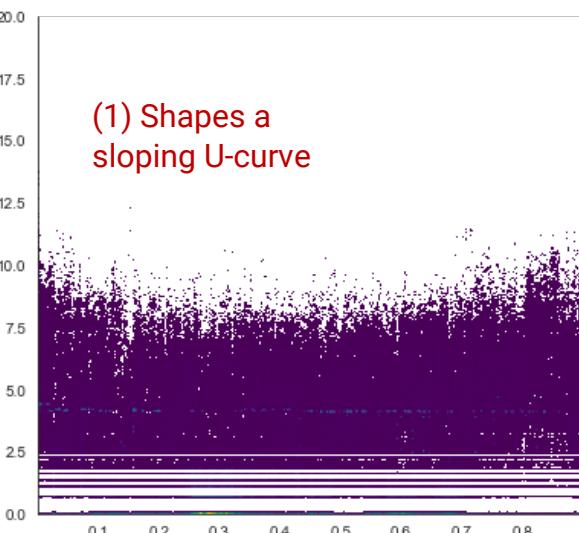
The duration to the previous donation is longer in the beginning and when the campaign is about to end

Density Scatterplot for Percentage Progress to Logged Duration to Previous Bin

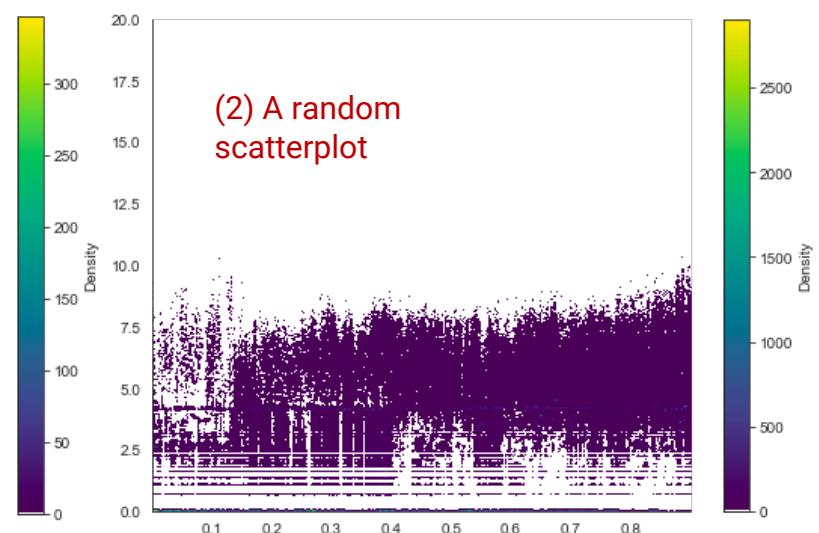
Pooled Data



Below Threshold



Above Threshold



- (1) Below threshold scatterplot begins to form a sloping U-curve below threshold, even though less visible
- (2) Above threshold scatterplot is more random, additional evidence that some above threshold campaigns were prolonged

Even though the R² is fairly small, percentage progress still explains about 4-5% of the variability

Polynomial Regression of Percentage Progress to Duration to Previous Bin

Green table for Pooled OLS Regression while Orange table for Regression with Fixed Effect of Campaign

	Pooled Data	Below Threshold	Above Threshold	Pooled Data	Below Threshold	Above Threshold
Pct Progress	1 -1.062*** 3.054***	-5.716*** 7.654***	0.110** 1.920***	2 -0.560*** 2.432***	-3.439*** 5.293***	0.182** 1.719***
Observations	1,213,156	244,904	968,252	1,213,156	244,904	968,252
Adj. R ²	3 0.035	0.049	0.037	0.460	0.437	0.467

- (1) The point of shortest duration between each donation is when progress reaches 17% (pooled) and 37% (below threshold).
- (2) Percentage progress lowers a bit in fixed effect model, but the point of shortest duration still around 10% (pooled) and 30% (below threshold)
- (3) Adjusted R-squared increased by nearly tenfold, showing a large effect of the campaign itself (the fixed effect)

After controlling other variables, percentage progress is still the one with highest effect size

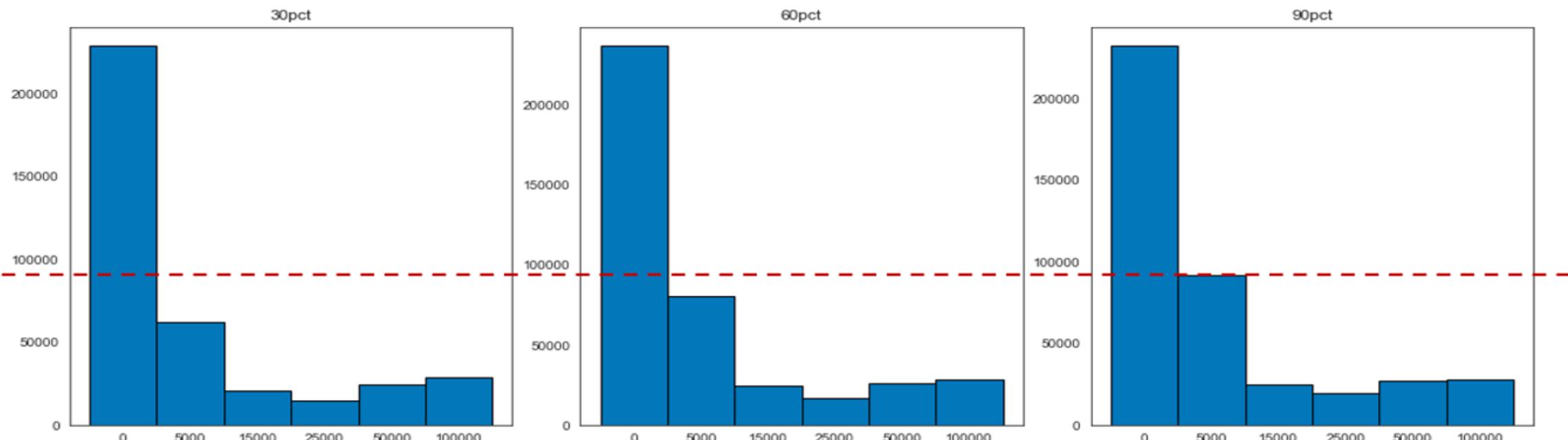
Variables	Pooled Data	Below Threshold	Above Threshold
Percentage Progress	1 -1.017***	-1.416***	-0.925***
Percentage Progress ²	1.131***	1.478***	1.050***
Days Category: Below Threshold	0.000		
Anonymity: True	-0.120***	-0.044***	-0.156***
Day: Thursday	-0.057***	-0.039***	-0.063***
Category: Medical & Health	-0.019**	0.014	-0.001
Observations	1,213,156	244,904	968,252
Adj. R ²	2 0.008	0.009	0.008

Regression of Campaign and Donors Characteristics to the Duration to Previous Bin

- (1) Progress bin and its polynomial form still have the largest effect size
- (2) Adjusted R-squared is lower than the model without control confirms the large effect size of progress bin

It seems that as the percentage progress increase, people make a slightly bigger size of donation

Count plot for Number of People Donating by Gift Size, Split into Three Progress Category



We can observe that the size of the donation, particularly for the size between IDR 5,000 and 15,000, somewhat increases as the percentage advancement rises (shown by red line)

However, the effect size of percentage progress is really small, even does not have effect at all

Regression of Percentage Progress to Duration to Previous Bin

Green table for Pooled OLS Regression while Orange table for Regression with Fixed Effect of Campaign

	Pooled Data	Below Threshold	Above Threshold	
Pct Progress	1 -3,226.24***	3,422.08***	-4,237.18***	-4436.48***
Observations	2 1,213,156	244,904	968,252	9,162.39***
Adj. R ²	0.000	0.000	0.000	-7,985.67***

- (1) While significant at $p = 0.001$, the coefficients sign are inconsistent between below and above threshold
- (2) Adjusted R-squared is 0, while in fixed effects is 1-3%, showing that while percentage progress is significant, the effect size is really small or even does not have effect at all compared to the other variables

After controlling regression, there are other variables with bigger effect size than pct. progress

Variables	Pooled Data	Below Threshold	Above Threshold
Percentage Progress	-8,407.96	9,015.95	-12,460.00
Days Category: Below Threshold	-5,635.15		
Day: Monday	-2,898.22	2,581.44	-5,154.19
Day: Tuesday	-2,600.56	9,603.42	-4,517.46
Day: Wednesday	-3,065.08	5,531.85	-5,604.83
Day: Thursday	-3,183.45	-621.13	-5,990.55
Day: Saturday	-4,069.86	2,534.67	-6,614.82
Day: Sunday	-6,259.56	-2,677.37	-7,356.84
Anonymity: True	-22,170.00	-7,641.47	-27,860.00
Verified: True	9,820.02	-3,196.70	10,000.00
Donation Target	0.00	0.00	0.00
Observations	1,213,156	244,904	968,252
Adj. R ²	0.012	0.021	0.011

Regression of Percentage Progress to Duration to Previous Bin After Controlling Other Variables

- The effect size of percentage progress is still considerably small, as it is measured in percentage
- The other variables like anonymity and verification outweigh the percentage progress effect size
- Inconsistency of the coefficient signs shows that some donations in above threshold are indeed were extended

While seed donation correlates with donation rate, it does not have influence on the amount of donation

– Hypothesis 1

Seed donation increases the **donation rate** of the campaign, shown by shorter duration to complete bin progress and duration to previous bin...

...but the rate falls after around the middle of the progress, shown by the duration that becomes longer again to the initial rate

When there are multiple choices of similar campaigns, seed is a good default as to choose as it shows the high-quality of the campaign to the others (signaling effect)

People set their reference of the progress bar to initial state, as the bar how far the campaigns have come is more salient, thus lower people's motivation when the campaign is about to achieve their target

– Hypothesis 2

The seed donation, shown by progress bar, has a little to no effect to **amount of donation** in Kitabisa

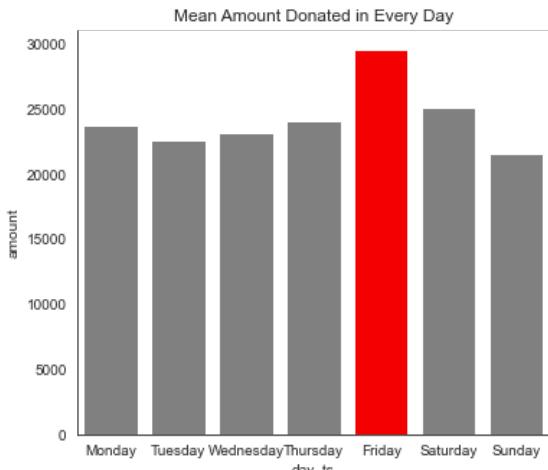
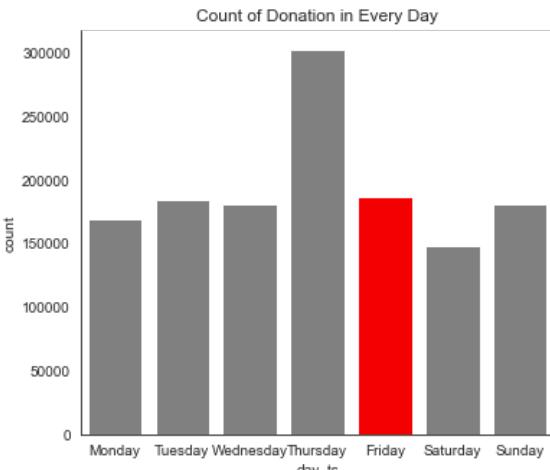
Visitors have opportunity to research the campaign to which they contribute to the end, thus influenced by the campaign story, pictures, etc.

Additional Discussions on Amount of Donation

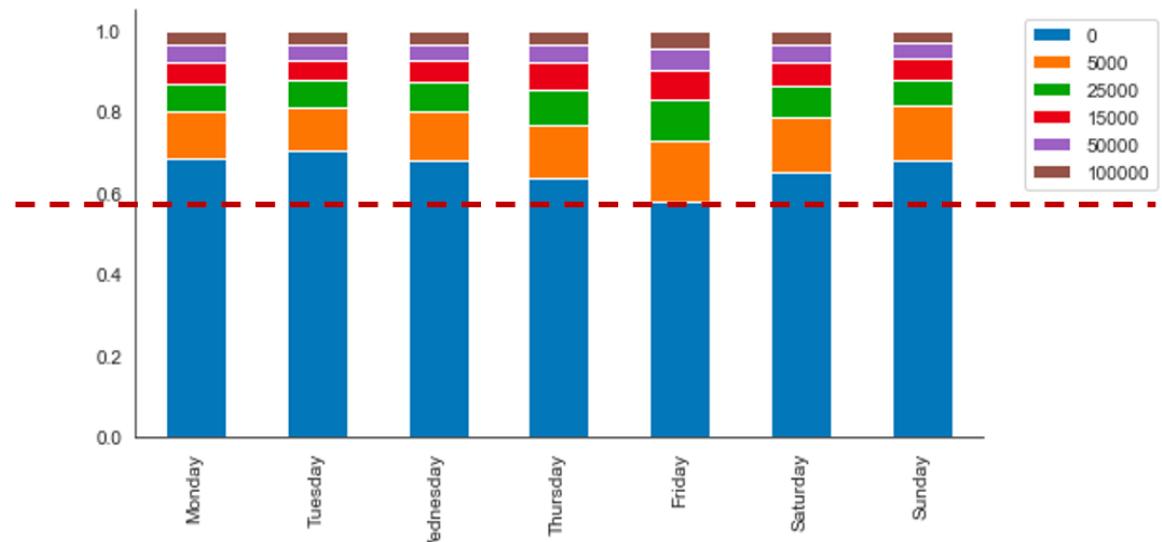


People make a bigger donation size on Friday even though most people visit the platform on Thursday

Count plot for and Amount Donated in Every Day



Amount Donated in Every Day by the Size

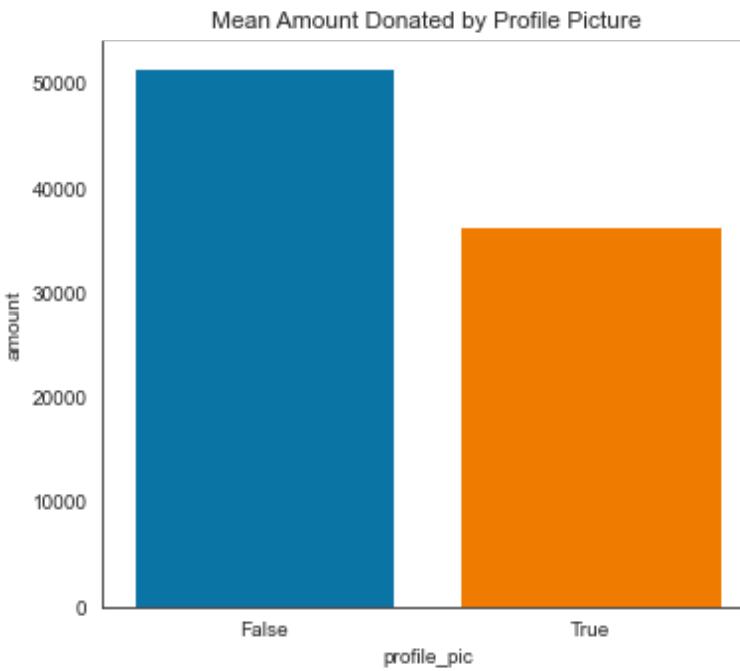
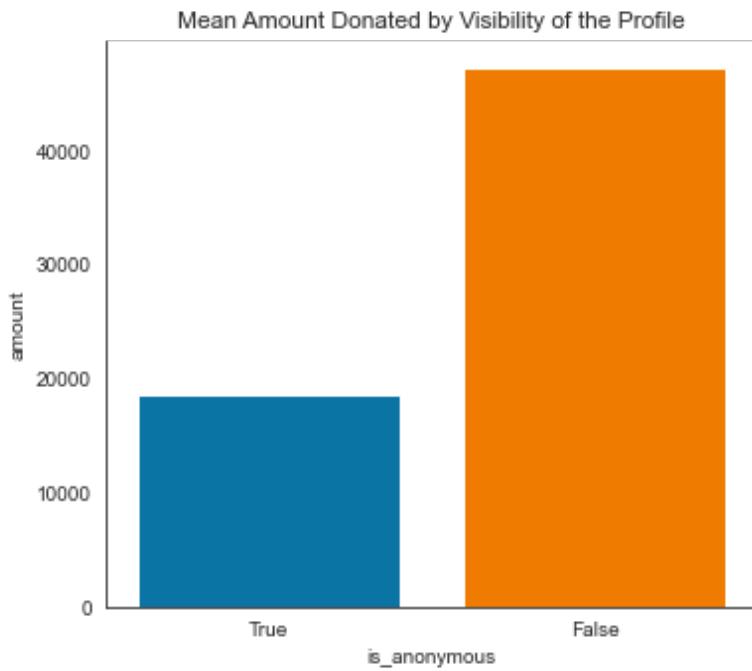


- Most of donors donating on Thursday, while the mean amount donated on Friday is the highest
- By proportion, small gift size (IDR 0 – 5,000) on Friday decreases and distributed to the other gift size
- ANOVA and Tukey post-hoc test shows amount on Friday is the highest compared to other days ($F (1,354,053, 27) = 37.081, p < 0.001$)

Even though non-anonymous donor donate bigger, this is not the case for the profile picture

Mean Amount for Profile Visibility and Their Profile Picture

Only includes donation that can be seen publicly sample on profile picture figure



- Most of donors donating anonymously (80.3%) rather than make it publicly seen (19.7%)
- Mean amount donated is higher for the donors who make their profile publicly seen by the others ($z = 72.455, p < 0.001$)
- However, people who open set up their profile picture donates lower than donors who do not set up their profile picture ($z = -9.044, p < 0.001$)

This study shows that day of donation and visibility of the donors influence the amount of donation

– Days of Donation –

Even though most people visit Kitabisa on Thursday, people making larger donation on Friday

As majority of people in Indonesia are Muslims, they perceive Friday as a blessing day for them do good deeds (cultural effect)

– Visibility by Anonymity and Profile Picture

People who make their profile open for public donate in larger size over people who donate anonymously...

People do really concern about their image, thus when making donation publicly, they want to show the other people that they are indeed generous

...however, people who set their profile picture donate less rather than people who do not set up it, even though it is supposed to increase the visibility

The profile picture can be anything. It does not have to be their face, or something that supposed to increase the visibility of the donors

Conclusion



Conclusion and Implications

- This study attempts to evaluate the effect of seed donation in a setting with multiple public goods through an observational study in Kitabisa
- While seed donation increases the donation rate during initial period, the rate decreases after the halfway of the progress. Meanwhile, seed donation does not influence the amount
- People making bigger donation either on Friday or when they make their profile visible to anyone (not-anonymous)
- From this study, campaigners are advised to make an initial seed only around 10-30% to show the others about the quality of the campaign
- Kitabisa team and crowdfunding sites in general can use this study to further research how the progress bar affects their visitor behavior

Limitation and Future Research

- Data is only limited on the campaigns' information; it could not control the demographic of the donors
- Not considering the visitors' funnel e.g., there might be some visitors that donate directly because it is shared from social media, not because they see the campaigns from the campaign list
- Not controlling the algorithm to order the campaigns on campaign list page
- This study could be extended by testing the findings in a more controlled laboratory experiment with three main treatments: number of public goods, amount of seed donation, and design of the progress bar
- In general, this study opens up opportunity to take and test lab-experiment research farther into the real-world situation given the sheer volume of this type of research
- In the opposite way, we can take the observational study and test the finding in a more controlled laboratory experiment

Thank You!

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Appendix A: Regression Between Bin Duration to Polynomial Form of Progress Bin After Controlling Campaign Characteristics

Variables	Pooled Data	Below Threshold	Above Threshold
Progress Bin	-47.389***	-12.476***	-75.319***
Progress Bin ²	4.5304***	1.208***	7.188***
Days Category: Below Threshold	-54.549***		
Category: Medical and Health	-35.157*	-13.721***	-90.572**
Category: Education	100.696**		72.706
Category: Natural Disaster	-1.280	9.452*	9.846
Category: Disabilities	-18.250		-4.008
Category: Social Activities	-18.848	-12.065***	
Category: Humanitarian	-17.332	-11.575***	-6.433
Category: Environment	-8.639		-28.984
Category: Animal Rescue	15.162	4.552	17.477
Category: Orphans	59.379**		29.852
Category: Place of Worship	16.927		22.234
Category: Zakat	-13.030	-0.122	-21.365
Campaigner Type: Personal	3.736	0.717	-4.576
Verified: True	29.545**	-0.827	69.290**
Donation Target	0.000	0.000**	0.000
Observations	486	216	270
Adj. R ²	0.241	0.370	0.210

*p < 0.05, **p < 0.01, ***p < 0.001. Coefficient estimates from OLS regression models for pooled data (1), below threshold campaigns (2) and above threshold campaigns (3).

Appendix B: Regression Between Duration to Previous Bin to Polynomial Form of Percentage Progress After Controlling Campaign and Donor Characteristics

Variables	Pooled Data	Below Threshold	Above Threshold
Percentage Progress	-1.017***	-1.416***	-0.925***
Percentage Progress ²	1.131***	1.478***	1.050***
Days Category: Below Threshold	0.000		
Day: Monday	0.020***	0.077***	0.010*
Day: Tuesday	0.010**	0.055***	0.002
Day: Wednesday	0.013***	0.079***	0.001
Day: Thursday	-0.057***	-0.039***	-0.063***
Day: Saturday	0.046***	0.061***	0.044***
Day: Sunday	0.006***	0.028***	0.002
Anonymity: True	-0.120***	-0.044***	-0.156***
Category: Medical and Health	-0.019**	0.014	-0.001
Category: Education	-0.005		0.009
Category: Natural Disaster	-0.001	-0.021*	0.027**
Category: Disabilities	-0.018		-0.008
Category: Social Activities	0.008	-0.020**	
Category: Humanitarian	-0.018**	-0.023**	-0.017
Category: Environment	0.002		0.016
Category: Animal Rescue	-0.006	-0.021	0.008
Category: Orphans	-0.006		0.008
Category: Place of Worship	-0.015**		0.000
Category: Zakat	0.017**	-0.059***	0.042***
Campaigner Type: Personal	-0.007	-0.009	-0.006
Verified: True	-0.009**	-0.015	-0.009**
Donation Target	0.000	0.000	0.000
Observations	1,213,156	244,904	968,252
Adj. R ²	0.008	0.009	0.008

*p < 0.05, **p < 0.01, ***p < 0.001. Coefficient estimates from OLS regression models for pooled data (1), below threshold campaigns (2) and above threshold campaigns (3).

Appendix C: Regression Between Percentage Progress to Donation Size After Controlling Campaign and Donor Characteristics

Variables	Pooled Data	Below Threshold	Above Threshold
Percentage Progress	-8,407.96	9,015.95	-12,460.00
Days Category: Below Threshold	-5,635.15		
Day: Monday	-2,898.22	2,581.44	-5,154.19
Day: Tuesday	-2,600.56	9,603.42	-4,517.46
Day: Wednesday	-3,065.08	5,531.85	-5,604.83
Day: Thursday	-3,183.45	-621.13	-5,990.55
Day: Saturday	-4,069.86	2,534.67	-6,614.82
Day: Sunday	-6,259.56	-2,677.37	-7,356.84
Anonymity: True	-22,170.00	-7,641.47	-27,860.00
Category: Medical and Health	43,060.00	22,320.00	14,730.00
Category: Education	5,282.18		-5,692.85
Category: Natural Disaster	203.78	-10,750.00	-9,925.97
Category: Disabilities	49,420.00		29,370.00
Category: Social Activities	-14,160.00	-7,050.57	
Category: Humanitarian	19,450.00	13,940.00	15,490.00
Category: Environment	-3,095.18		-32,850.00
Category: Animal Rescue	6,692.92	20,940.00	-34,960.00
Category: Orphans	12,900.00		1,775.39
Category: Place of Worship	16,860.00		5,571.11
Category: Zakat	3,016.78	14,830.00	-7,226.18
Campaigner Type: Personal	16,620.00	5,389.65	35,070.00
Verified: True	9,820.02	-3,196.70	10,000.00
Donation Target	0.00	0.00	0.00
Observations	1,213,156	244,904	968,252
Adj. R ²	0.012	0.021	0.011

*p < 0.05, **p < 0.01, ***p < 0.001. Coefficient estimates from OLS regression models for pooled data (1), below threshold campaigns (2) and above threshold campaigns (3).