

Physical Reward Tiers and Backer Behaviour in Social-Impact Crowdfunding

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ABSTRACT

This study examines associations between physical reward tiers and backer behaviour in Kickstarter social-impact campaigns. It distinguishes reward-based crowdfunding, in which backers choose and pay for listed rewards, from unconditional charitable giving. Using 2,034 campaigns and a cleaned tier-level dataset of 15,197 reward tiers, campaign models control for campaign characteristics, logged reward-tier count, and fixed effects for social-impact theme, launch month, and country. The initially positive physical-reward association is not statistically distinguishable from zero after controlling for tier count. Within campaigns, physical tiers are associated with higher logged backer demand. A quadratic specification has a fitted turning point of \$7.11 (95% CI: \$4.61-\$10.73); because the median reward tier is \$75, estimated demand is declining across the central observed range. These are conditional associations rather than causal effects.

Keywords: Crowdfunding; Kickstarter; reward tiers; backer behaviour; reciprocity; motivation crowding-out; reward-menu design; social impact

INTRODUCTION

1.1 The Significance of Charitable Donations

Charitable donations underpin a large share of the work that addresses problems markets and governments leave unsolved, including poverty relief, disaster response, access to education, medical research, and environmental protection. The scale of this giving is considerable. In the United States, total charitable contributions reached an estimated US\$592.5 billion in 2024, one of the highest figures on record, with individuals supplying roughly two-thirds of the total (Giving USA Foundation, 2025). These numbers describe an activity that is economically significant and socially indispensable, and they explain why both researchers and practitioners devote sustained attention to understanding what makes people give.

The headline totals, however, conceal a more uncertain picture at the level of the individual donor. Participation has been drifting downward in several major economies even as aggregate giving holds

steady, implying that a shrinking pool of donors accounts for a growing share of contributions (Charities Aid Foundation, 2024). A 2024 global analysis similarly reported that charitable behaviours, including donating money, volunteering time, and helping strangers, declined relative to their recent peak, underscoring how fragile donor engagement can be (Gallup & Charities Aid Foundation, 2025). Research on donor retention identifies this as a persistent challenge: many donors give once and do not return, making the question of how to sustain engagement as important as how to attract it (Sargeant, 2001). This combination of high totals and uneven participation raises a practical question for any fundraising organisation: which design choices actually move donors to give, and to give more?

1.2 Understanding Physical Return Gifts

One of the most common design choices is the physical return gift: a tangible item such as a tote bag, a printed book, a piece of merchandise, or a finished product, offered to a donor in recognition of, or in exchange for, a contribution. On its surface, the logic seems obvious. A gift lowers the net cost of giving, signals appreciation, and leaves the donor with a lasting reminder of the cause. However, decades of behavioural research highlight that the effect is far from straightforward, because a return gift can activate two psychological mechanisms that pull in opposite directions.

The first mechanism is reciprocity. When an organisation gives something first, the donor may feel a social obligation to respond in kind, raising the chance of a contribution. This intuition is grounded in gift-exchange theory, which holds that receiving a benefit creates a norm of reciprocation (Falk, 2007). In a now-classic field experiment distributing roughly 10,000 solicitation letters, Falk found that including a small gift raised the frequency of donations by about 17%, while a larger gift raised it by roughly 75% compared to a no-gift control. Separately, Kube et al. (2012) demonstrated that non-monetary, tangible gifts trigger significantly stronger reciprocal responses than equivalent cash rewards, suggesting that the physical and symbolic qualities of a gift matter for how donors respond.

The second mechanism is motivation crowding-out. A gift can reframe an altruistic act as a market transaction, weakening the intrinsic motivation to give. Deci and Ryan (1985) established through self-determination theory that intrinsic motivation is fragile in the presence of external rewards: introducing a material incentive for an intrinsically motivated behaviour shifts the perceived locus of causality from internal to external, eroding the original motivation. In the context of charitable giving, Newman and Shen (2012) demonstrated this crowding-out effect directly: across six experiments, offering a thank-you gift consistently lowered average donations regardless of the gift's desirability or value. More broadly, Gneezy et al. (2011) showed that incentives in general can crowd out the very behaviour they aim to encourage when they shift an individual's decision frame from social to monetary.

Crucially, these two mechanisms need not affect the same outcomes in the same direction. Reciprocity may increase the number of donors a campaign attracts, while crowding-out may reduce how much each donor gives, or discourage donors from engaging with particular reward tiers altogether if the price point makes giving feel transactional and expensive. The net effect on fundraising, therefore, depends on which

force dominates and on the specific context in which the gift is offered, making the question genuinely empirical rather than something theory alone can settle.

1.3 Significance of the Study

Resolving this ambiguity matters because non-profits and campaign organisers spend real resources producing and distributing return gifts. A recent systematic review found that the evidence on material incentives in charitable giving is mixed at best, and that the direction of the effect depends critically on contextual factors that existing studies have not fully disentangled (Chapman & Thai, 2026). If gifts mostly attract additional small donors, an organisation gains breadth but may sacrifice the high-value contributions that intrinsically motivated donors would otherwise make. If gifts raise both donor participation and average amounts, they are an unambiguous tool worth investing in. Without evidence specific to the setting, fundraisers are left guessing and may allocate scarce resources toward strategies that are inefficient or even counterproductive. Beyond fundraising, the question speaks to a broader debate in behavioural economics about how external incentives interact with intrinsic motivation in prosocial behaviour, an issue that recurs in volunteering, blood donation, and public policy.

1.4 Aim and Research Question

This study investigates the question: How do physical return gifts influence donor behaviour in crowdfunding campaigns, and under what conditions does their effectiveness vary?

Using campaign-level data, the analysis first examines whether offering a physical return gift is associated with total funds raised, number of backers, average donation per backer, and campaign success. It then examines whether this association varies with reward pricing and menu size. The analyses cannot distinguish psychological crowding-out from ordinary price response, selection, or other unobserved campaign differences; they are therefore interpreted as conditional associations in a reward-based marketplace.

LITERATURE REVIEW

Research on return gifts and donor behaviour divides into two broad camps. One body of work finds that tangible gifts increase giving through reciprocity and relational reinforcement; the other finds that they suppress giving by crowding out intrinsic motivation and reframing giving as an exchange. Reviewing both is essential because this study is positioned precisely at the point where they conflict.

2.1 Theoretical Foundations

The theoretical backdrop to this debate draws on two distinct traditions. The first is the economics of altruism and warm-glow giving. Andreoni (1990) argued that donors derive utility not only from the social impact of their gift (pure altruism) but also from the act of giving itself, a phenomenon he termed 'warm glow.' Warm-glow motivation is intrinsic: the satisfaction comes from giving per se, independently of what the recipient does with the funds. A return gift may strengthen the warm glow by signalling that the organisation values the donor, or may displace it by making the act feel like a purchase, making this distinction central to predicting whether gifts help or harm overall donation outcomes.

The second tradition is self-determination theory (SDT), which distinguishes autonomous (intrinsic) from controlled (extrinsic) motivation and predicts that introducing an external reward for an already intrinsically motivated behaviour shifts its perception from autonomous to controlled, weakening the original motivation (Deci & Ryan, 1985). These two frameworks set up the competing predictions that the empirical literature below attempts to adjudicate: gifts may complement warm glow through reciprocal reinforcement, or they may crowd it out by introducing transactional framing, depending on the setting.

2.2 Branch One: Return Gifts Increase Donations

The strongest evidence that gifts raise giving comes from reciprocity and gift-exchange theory, which holds that receiving something creates a felt obligation to respond. Falk's (2007) large field experiment remains the cornerstone: by randomly varying whether solicitation letters contained a small gift, a large gift, or none, he isolated a causal effect and found that gifts measurably increased donation rates, with larger gifts producing proportionally larger increases. Because the design was a randomised natural field experiment rather than a laboratory study, its findings carry unusual external validity and have been cited extensively as proof that reciprocity operates in real giving decisions.

Karlan and List (2007) complemented this result by showing that matching grants, financial incentives that reduce the effective price of giving, reliably increase both donation probability and revenue per solicitation in a natural field experiment with over 50,000 prior donors. Eckel and Grossman (2003) further showed that matching subsidies, which frame giving as receiving a benefit, generate larger total donations than equivalent rebate subsidies, suggesting that how an incentive is presented shapes donor response. Separately, Kube et al. (2012) found in a controlled workplace field experiment that non-monetary, tangible gifts trigger significantly stronger reciprocal effort than equivalent cash gifts, indicating that the physical nature of a reward matters beyond its monetary value.

Merchant et al. (2010) examine charitable storytelling and its influence on donor emotions and intentions, rather than the effect of donor acknowledgements on relational outcomes. The study is therefore not used here as direct evidence that acknowledgements or tangible tokens increase giving. Sargeant and Woodliffe (2007) discuss donor loyalty and commitment in charitable giving, but these relational findings are treated as background rather than as evidence that Kickstarter reward tiers create the same mechanism.

2.3 Branch Two: Return Gifts Decrease Donations

The opposing tradition centres on motivation crowding out. Newman and Shen's (2012) six experiments are the most influential demonstration: people predicted that thank-you gifts would raise donations, but in practice, the gifts consistently lowered the average amount given. The effect held across charities, gift types, and whether the donation was real or hypothetical.

They explain that a gift shifts the donor's frame from altruistic ('I give to help') to transactional ('I give, I receive'), weakening the warm-glow satisfaction that motivates large gifts. Yang and Yang (2022) confirmed a related mechanism: donors who believe a gift is costly to the charity reduce their donations

because the gift signals administrative overhead rather than direct impact. These findings align with the broader principle documented by Gneezy et al. (2011) that incentives can crowd out prosocial behaviour when they alter the perceived meaning of the act by shifting the interaction from a social to a monetary frame. Frey and Oberholzer-Gee (1997) similarly show that monetary compensation can interact with non-price motives in a different policy setting, reinforcing that such mechanisms must be demonstrated rather than assumed.

A second line of evidence suggests that reciprocity can decay over time. Chuan et al. (2018), studying more than 18,000 hospital donation requests, found that reciprocity decays sharply as the delay between a service encounter and a solicitation grows. A recent systematic review finds mixed evidence for self-benefiting incentives in charitable giving, with effects that depend on contextual factors that earlier studies did not fully disentangle (Chapman & Thai, 2026).

2.4 Research Gap and Contribution

The literature presents a clear dichotomy: reciprocity and relational mechanisms predict more giving, while crowding-out and transactional framing predict less. A close reading reveals why these findings can coexist. Much of the existing research measures only one outcome, usually whether a person donates or how much an individual gives, rather than tracking multiple donation outcomes together within the same setting. Crucially, little evidence evaluates how reward-tier price relates to backer demand within reward-based crowdfunding; the present study therefore estimates a conditional relationship rather than presuming a beneficial or harmful price point.

Kickstarter provides an opportunity to examine reward-menu design at scale. Mollick's (2014) study established that quality signals, funding goals, and campaign duration predict crowdfunding success. Belleflamme et al. (2014) likewise showed that reward design and backer incentives are central to crowdfunding outcomes. Kuppuswamy and Bayus (2018) further document that backer participation changes systematically across a Kickstarter campaign's funding cycle. By analysing campaign outcomes and tier-level backer demand, this study examines conditional associations in reward-based crowdfunding. A charity thank-you gift is typically unconditional, whereas a Kickstarter reward tier is selected and paid for by a backer. The present study therefore uses charitable-giving research only to frame possible mechanisms; it does not treat a downward-sloping relationship between price and tier demand as separate evidence of psychological crowding-out.

METHODOLOGY

3.1 Data Source

The data for this study were collected from Kickstarter (www.kickstarter.com), a reward-based crowdfunding platform. Kickstarter allows creators to publish a campaign with a funding goal, a deadline, a description, and a set of reward tiers; backers then choose a tier and pledge money under its stated terms. The platform provides publicly accessible campaign and reward-tier information, enabling an analysis of associations between reward-menu design and backer behaviour. Its broad project categories

also allow descriptive comparisons across social-impact themes (Mollick, 2014; Belleflamme et al., 2014). Crucially, this setting is not equivalent to an unconditional charitable thank-you gift: a Kickstarter reward is conditional, *ex ante*, and selected by the backer, so the analysis is framed as reward-based demand rather than a direct test of charitable reciprocity.

Although Kickstarter is not a pure charity environment, this feature is analytically useful rather than disqualifying: it provides natural variation in whether and how a tangible reward is attached to a contribution, which is exactly the variation this study needs.

3.2 Data Collection and Sample

For the empirical analysis, the study searched Kickstarter using the term "social impact" and constructed a campaign-level dataset of social-impact-related crowdfunding campaigns. The extraction was conducted from February 8 through May 26, 2026. The raw extraction contained 2,038 campaigns, 17,222 reward tiers, 14,053 reward items, 1,014 add-ons, and 2,038 backer-summary records. After removing live campaigns and requiring non-missing campaign goal, pledged amount, and backer count, the descriptive campaign dataset contains 2,034 campaigns; the main regression models use 1,979 observations (1,794 for average donation) after complete-case requirements. The cleaned tier-analysis file contains 15,197 tiers after deduplication; the fixed-effects models use 14,989 complete tier observations. Themes were assigned from campaign titles, blurbs, categories, and mission-related keywords into nine social-impact categories.

Table 1a. Sample Flow for Campaign- and Tier-Level Analyses

Stage	Campaigns	Reward tiers
Raw extraction	2,038	17,222
Campaign analysis sample	2,034	-
Gift-only comparison	2,003	-
Cleaned tier analysis	-	15,197
Tier fixed-effects model sample	-	14,989

3.3 Variables and Main Outcomes

The main independent variable is an indicator for whether a campaign offers at least one physical return gift. A physical gift is defined as a tangible reward tier, identified using reward descriptions, item names, shipping information, and keywords such as shirts, books, posters, mugs, merchandise, physical products, boxes, kits, or rewards requiring shipping. Additionally, the analysis constructs a broader indicator for whether the campaign offers any return gift, physical or non-physical. However, as almost all campaigns offer some form of return gift, the main analysis focuses on physical gifts rather than the mere presence of any reward.

Table 1b. Physical-Reward Classification Terms

Classification category	Operational rule
Item type	Shirts; books; posters; mugs; boxes; kits
Product term	Merchandise; physical product
Delivery condition	Shipping condition

The main outcomes are total pledged amount, number of backers, average donation per backer, whether the campaign receives any donations, and whether the campaign succeeds. These outcomes distinguish campaign scale, backer participation, and average pledge size. The analysis examines whether physical reward availability is conditionally associated with these outcomes; it does not interpret a price–demand relationship as direct evidence that an external reward psychologically crowds out generosity.

The regression control vector includes log campaign goal, log campaign duration, log campaign description length, video, add-on, and $\log(1 + \text{non-no-reward-tier count})$ indicators. The models include fixed effects for social-impact theme, launch year-month, and country, with standard errors clustered by creator identifier. The descriptive campaign dataset contains 1,959 creator identifiers; the revised continuous-outcome campaign regressions use 2,025 observations with complete covariate information, and the tier models use 14,989 observations with campaign fixed effects and project-clustered standard errors. Collinearity is modest: the variance-inflation factors are 1.24 for the physical-reward indicator and 1.40 for logged tier count, with all other core controls at or below 1.18. The mean menu contains 8.11 tiers for physical-reward campaigns and 3.13 for nonphysical-only campaigns, making this adjustment material.

FINDINGS AND DISCUSSION

4.1 Descriptive Statistics

Table 1 summarises the campaign-level sample. The average campaign raises approximately \$32,523 (USD); however, the median pledged amount is much lower, at approximately \$1,064, indicating that campaign outcomes are highly skewed. The average campaign receives about 203 backers while the median receives only 18, reinforcing this skew. The average donation per backer is approximately \$86.81, with a median of \$56.25. Campaigns typically last around 35 days on average, with a median of 30 days. Return gifts are extremely common in the sample: 98.5% of campaigns offer some form of return gift, and

87.9% offer at least one physical return gift. This near-universality of gift-offering motivates the main empirical design: rather than comparing campaigns with any reward to those without, the analysis compares campaigns with physical gifts to campaigns offering only non-physical rewards.

Statistic	Value
Number of campaigns	2,034
Number successful	985
Success rate	48.4%
Number with any return gift	2,003
Share with any return gift	98.5%
Number with physical gift	1,788
Share with physical gift	87.9%
Mean campaign target (USD)	\$56,147
Median campaign target (USD)	\$6,362
Mean pledged amount (USD)	\$32,523
Median pledged amount (USD)	\$1,064
Mean backers	203.0
Median backers	18
Mean average donation per backer (USD)	\$86.81
Median average donation per backer (USD)	\$56.25
Mean campaign duration (days)	35.3
Median campaign duration (days)	30
Mean number of reward tiers	7.46
Median number of reward tiers	6
Mean reward-tier value (USD)	\$433.61
Median reward-tier value (USD)	\$75
Share with add-ons	6.2%
Share with video	68.5%
Share with image	100.0%

Table 1. Campaign-Level Summary Statistics (N = 2,034)

Note. All monetary values are in USD. As every campaign has an image, the image indicator has no meaningful variation for regression identification.

4.2 Descriptive Differences by Gift Type

Table 2 compares campaigns across three groups: no return gift, non-physical return gift only, and at least one physical return gift. The raw descriptive patterns show large differences. Physical-gift campaigns have a success rate of 50.6%, compared with 26.5% among campaigns with only non-physical return gifts. Physical-gift campaigns also have substantially higher median pledged amounts and median backer counts: the median physical-gift campaign raises approximately \$1,351 and receives 22 backers, while the median non-physical-gift campaign raises only \$51 and receives 3 backers. The no-return-gift group is unusually successful (success rate 74.2%, mean pledged \$266,002), but contains only 31 campaigns. This small group is therefore treated as an exploratory descriptive pattern rather than a causal comparison; further data on organisation type and campaign goals would be needed to explain it.

Gift group	N	Success rate	Mean pledged (USD)	Median pledged (USD)	Mean backers	Median backers	Mean avg. donation (USD)	Median avg. donation (USD)
No return gift	31	74.2%	\$266,002	\$4,736	1,856.0	64	\$113.91	\$67.98
Nonphysical only	215	26.5%	\$1,549	\$51	19.3	3	\$56.96	\$27.05
Physical return gift	1,788	50.6%	\$32,200	\$1,351	196.5	22	\$89.48	\$59.26

Table 2. Descriptive Outcomes by Gift Group

Note. Gift groups are mutually exclusive. All monetary values in USD. Values are unadjusted descriptive means and medians.

The model-free comparison within the gift-only sample is presented in Table 3. Among campaigns offering at least one return gift, physical-gift campaigns raise about \$30,651 more on average, attract approximately 177 more backers, and have average donations roughly \$32.52 higher than non-physical-gift campaigns. Physical-gift campaigns also offer nearly three times as many reward tiers on average (8.11 versus 3.13), making menu richness a material confound. The revised main models therefore control for logged tier count, while the separate interaction analysis examines whether the association varies with menu size. All differences are statistically significant ($p < 0.001$ or $p = 0.004$ for pledged amount), but they remain unadjusted comparisons.

Outcome	Nonphysical only	Physical gift	Difference	p-value
Pledged amount (USD)	\$1,549	\$32,200	\$30,651	0.004
Number of backers	19.3	196.5	177.2	<0.001
Average donation per backer (USD)	\$56.96	\$89.48	\$32.52	<0.001
Has any donation	81.4%	92.1%	+10.7 pp	<0.001
Success rate	26.5%	50.6%	+24.1 pp	<0.001
Mean reward tiers	3.13	8.11	4.98	<0.001

Table 3. Model-Free Comparison Among Campaigns with Return Gifts (Physical vs. Non Physical)

Note. Compares physical-gift and nonphysical-gift-only campaigns within the gift-only sample. p-values are from two-sided Welch t-tests. The strong mean-median gaps indicate that campaign outcomes are highly skewed.

4.3 Main Regression Specification

To control for observable differences across campaigns, the study estimates the following campaign-level specification:

$$Y_i = \alpha + \beta \text{PhysicalGift} + X_i\gamma + \delta \text{theme}(i) + \lambda \text{launch_month}(i) + \eta \text{country}(i) + \varepsilon_i$$

Here, i indexes campaigns. The outcome Y_i is logged pledged amount, logged backers, logged pledge per backer, whether the campaign receives any donation, or whether the campaign succeeds. PhysicalGift_i equals one if a campaign offers at least one physical reward tier. The control vector X_i includes campaign goal, duration, description length, video, add-on, and logged non-no-reward-tier count indicators. The model includes social-impact-theme, launch-year-month, and country fixed effects with creator-clustered standard errors.

The regression estimates should be interpreted as conditional associations rather than causal effects. The models control for observed campaign characteristics, timing, geography, and theme, but cannot fully eliminate unobserved differences in campaign quality or creator reputation. For logged outcomes, coefficients can be interpreted approximately as percentage changes using $100 \times (\exp(\beta) - 1)$. For binary outcomes estimated with linear probability models, the coefficients are interpreted as percentage-point changes.

4.4 Main Regression Results: Physical Return Gifts

In the baseline campaign models, physical reward availability is positively associated with logged pledged amount ($\beta = 1.274$, $SE = 0.229$, $p < .001$), logged backers ($\beta = 0.640$, $SE = 0.125$, $p < .001$), and logged average donation ($\beta = 0.481$, $SE = 0.108$, $p < .001$). Once logged tier count is added, however, the physical-reward coefficients are -0.101 ($SE = 0.247$, $p = .682$) for pledged amount, -0.155 ($SE = 0.133$, p

= .246) for backers, and 0.118 (SE = 0.119, $p = .323$) for average donation. The adjustment therefore removes evidence of an independent positive association between physical-reward availability and these outcomes.

Logged tier count is itself strongly associated with the three logged outcomes ($\beta = 1.726$ for pledged amount, 0.997 for backers, and 0.449 for average donation; all $p < .001$). A Poisson pseudo-maximum-likelihood robustness check yields no positive physical-reward association for backer count ($\beta = -0.442$, SE = 0.453, $p = .329$) and a negative association for pledged amount ($\beta = -0.739$, SE = 0.355, $p = .037$). These robustness results reinforce the conclusion that the positive baseline coefficients should not be interpreted as a distinct physical-reward effect.

Table 4. Campaign-Level Models Controlling for Logged Reward-Tier Count

Predictor	ln(Pledged + 1)	ln(Backers + 1)	ln(Avg. pledge + 1)
Physical reward	-0.101 (0.247)	-0.155 (0.133)	0.118 (0.119)
ln(Non-no-reward tiers + 1)	1.726*** (0.123)	0.997*** (0.073)	0.449*** (0.053)
N	2,025	2,025	2,025

Note. Coefficients with creator-clustered standard errors in parentheses. All models include the campaign controls and theme, launch-month, and country fixed effects. *** $p < .001$.

4.5 Reward-Menu Size and Physical Gifts

The next analysis examines whether the association between physical gifts and donation outcomes depends on the size of the reward menu. Campaigns with more reward tiers may offer donors more flexibility, allowing them to select a contribution level that better matches their willingness to pay. To test this, the study adds an interaction between the physical-gift indicator and the log number of reward tiers:

$$Y_i = \alpha + \beta_1 \text{PhysicalGift} + \beta_2 \log(1 + \text{RewardTiers}) + \beta_3 [\text{PhysicalGift} \times \log(1 + \text{RewardTiers})] + X_i\gamma + FE + \varepsilon_i$$

The coefficient of interest is β_3 . A positive β_3 means that the physical-gift association becomes stronger when campaigns offer more reward tiers. Table 5 reports these estimates.

	Log pledged	Log backers	Log avg. donation
Physical gift	-2.558*** (0.477)	-1.933*** (0.285)	-0.285 (0.218)
Log number of reward tiers	-0.007 (0.331)	-0.257 (0.202)	0.174 (0.136)
Physical gift x log reward tiers	2.031*** (0.350)	1.470*** (0.210)	0.326** (0.148)
Controls, FE	Yes	Yes	Yes
Observations	1,979	1,979	1,794

Table 5. *Physical Gift × Reward-Tier Count Interaction*

Note. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$. The positive interaction term indicates that physical gifts are especially associated with stronger outcomes when embedded in larger reward menus.

The interaction between physical reward availability and logged reward-tier count is positive and statistically significant for logged pledged amount ($\beta = 2.031$, $SE = 0.350$, $p < .001$), logged backers ($\beta = 1.470$, $SE = 0.210$, $p < .001$), and logged average donation ($\beta = 0.326$, $SE = 0.148$, $p = .028$). For logged pledged amount, combining the physical-gift constant (-2.558) with the interaction coefficient implies an estimated physical-gift association of about -1.15 at one tier, -0.33 at two tiers, and +0.26 at three tiers; it turns positive at roughly 2.5 tiers. Thus, the interaction should be read as a menu-size-dependent association, not as a stand-alone effect evaluated at zero tiers, which cannot occur for a physical-gift campaign.

4.6 Heterogeneity by Social-Impact Theme

The meaning and appeal of a physical gift may vary by campaign theme. A physical gift may feel natural for arts, culture, design, or community projects, where a tangible artefact has obvious creative or collector value. Conversely, in campaigns related to health, poverty, or humanitarian causes, a physical gift may feel more transactional, potentially conflicting with the altruistic framing of the appeal. To examine this possibility, the study estimates a version of the main regression that interacts with the physical-gift indicator with theme dummies.

Theme estimates are treated as exploratory because the data do not establish causal effects or precise theme-specific differences in the physical-reward association. Figure 1 (a segmented bar chart of gift composition across social-impact themes) shows that physical-gift prevalence varies across themes: arts and culture campaigns use physical gifts more intensively, while health and equity/justice campaigns show slightly lower shares. This descriptive pattern does not establish theme-specific performance effects.

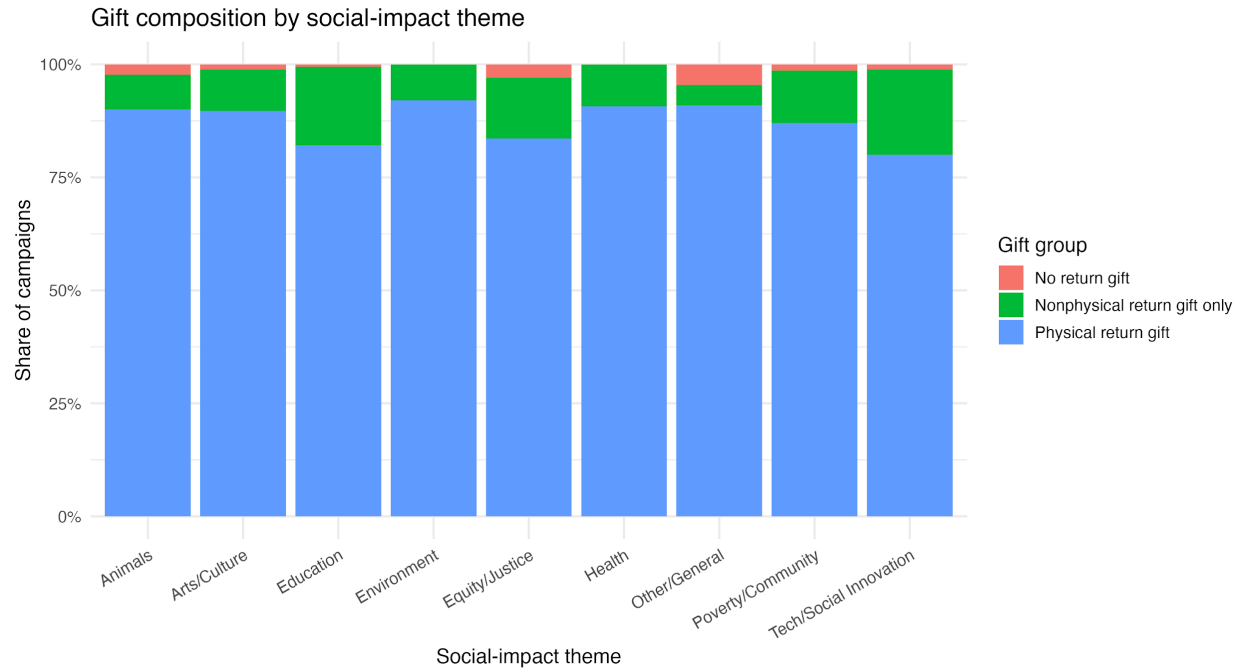


Figure 1. Gift Composition by Social-Impact Theme (Share of Campaigns, %)

Note. Each bar shows the proportion of campaigns in each social-impact theme that offer a physical return gift (blue), a nonphysical return gift only (green), or no return gift (red). Physical return gifts dominate across all themes.

4.7 Reward-Tier-Level Analysis

The campaign-level regressions compare different campaigns, raising the concern that physical-gift campaigns may differ from non-physical-gift campaigns in unobserved ways. To partially address this, the study uses reward-tier-level data and compares physical and non-physical reward tiers within the same campaign. This within-campaign design absorbs all campaign-level characteristics common across reward tiers, such as creator reputation, campaign quality, category, launch timing, and overall project appeal, via campaign fixed effects:

$$\log(1 + \text{Backers}_{ij}) = \alpha_i + \beta_1 \text{PhysicalTier}_{ij} + \beta_2 \log(1 + \text{RewardValue}_{ij}) + \beta_3 \text{RewardValueShare}_{ij} + \beta_4 \text{RewardIndex}_{ij} + \epsilon_{ij}$$

Here, i indexes campaigns and j indexes reward tiers. The reward index is the ordinal position of a tier within its campaign menu, beginning with the lowest listed tier. Reward-value share is the tier's minimum pledge threshold divided by the campaign goal. The campaign fixed effect α_i means that identification compares tiers within the same campaign. Table 6 reports the reward-tier fixed-effect results.

	Level backers	Log backers	Log backers (with value-share interaction)	Log tier revenue
Physical reward tier	-1.250 (1.779)	0.236*** (0.032)	0.237*** (0.032)	0.713*** (0.070)
Log reward value (USD)	--	-0.247*** (0.015)	-0.248*** (0.015)	-0.188*** (0.024)
Reward value / goal	0.028* (0.016)	0.000 (0.001)	0.003*** (0.001)	-0.004*** (0.001)
Reward index	-2.464** (0.959)	-0.025*** (0.007)	-0.025*** (0.007)	-0.002 (0.010)
Physical tier x value share	--	--	-0.003*** (0.001)	--
Campaign FE	Yes	Yes	Yes	Yes
SE clustered by campaign	Yes	Yes	Yes	Yes
Observations	14,989	14,989	14,989	14,989

Table 6. Reward-Tier Fixed-Effect Models

Note. Models include campaign fixed effects; comparisons are within the same campaign. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Within campaigns, physical tiers are associated with 0.236 higher logged backers ($SE = 0.032$, $p < .001$). The physical-tier $\times$ reward-value-share interaction is negative and statistically significant ($\beta = -0.00345$, $SE = 0.00087$, $p < .001$), but its implied zero crossing is far outside plausible reward-to-goal ratios. The raw-count coefficient is negative but not statistically significant ($\beta = -1.250$, $SE = 1.779$); the sign difference reflects the highly skewed distribution of tier backers, for which the logged outcome emphasizes relative differences. The value-share coefficients also differ across level, logged, and revenue outcomes, so they should not be interpreted as a common directional effect.

The value-share interaction is statistically significant but economically difficult to interpret without its distribution. At the 5th, 25th, 50th, 75th, and 95th percentiles of reward-value share, the estimated physical-tier association is respectively 0.237, 0.237, 0.237, 0.237, and 0.236 log points; each 95% confidence interval remains positive (approximately 0.17 to 0.30). The implied zero crossing is roughly 68 times the campaign goal, far outside the observed central support. The coefficient therefore does not establish practically meaningful moderation over normally observed reward-to-goal ratios; the within-campaign results should be read as conditional associations.

4.8 Nonlinear Reward Pricing: Concavity in Reward-Tier Demand

The final analysis examines whether reward-tier demand is nonlinear in reward value. A quadratic specification is concave, but concavity alone does not establish that a peak is economically relevant. Following Lind and Mehlum (2010) and Haans et al. (2016), the analysis reports the fitted turning point,

its confidence interval, and endpoint-slope evidence across the observed price range. These tests describe conditional tier demand rather than a recommended menu price.

$$\log(1+\text{Backers}) = \alpha_i + \beta_1 \log(1+\text{RewardValue}) + \beta_2 [\log(1+\text{RewardValue})]^2 + \beta_3 \text{PhysicalTier} + \beta_4 \text{RewardIndex} + \varepsilon_i$$

A positive linear term and a negative squared term establish a concave fitted relationship. The estimated turning point is evaluated against the observed price distribution and endpoint slopes, rather than treated as a universal optimal-price rule.

	Inverted-U model	Inverted-U x physical tier
Log reward value (USD)	0.186*** (0.025)	0.227*** (0.031)
Log reward value squared	-0.0445*** (0.0026)	-0.0446*** (0.0036)
Physical reward tier	0.0846*** (0.031)	0.446*** (0.097)
Reward index	-0.0253*** (0.0066)	-0.0238*** (0.0065)
Physical tier x log reward value	--	-0.102** (0.046)
Physical tier x log reward value squared	--	0.0033 (0.0049)
Campaign FE; SE clustered by campaign	Yes	Yes
Observations	14,989	14,989
Within R-squared	0.306	0.309

Table 7. Quadratic Reward-Tier Demand Models

Note. The pooled fitted turning point is \$7.11 (95% CI: \$4.61-\$10.73). The full observed range is \$1-\$11,604, while the interquartile range is \$25-\$300. The model should not be interpreted as identifying an optimal mid-priced tier. *** $p < 0.01$, ** $p < 0.05$.

The pooled quadratic model estimates a turning point of \$7.11 (95% CI: \$4.61-\$10.73). The linear log-price coefficient is positive ($\beta = 0.186$, $SE = 0.025$, $p < .001$) and the squared term is negative ($\beta = -0.0445$, $SE = 0.0026$, $p < .001$). The derivative is positive at the \$1 lower endpoint (0.124, $SE = 0.022$, one-sided $p < .001$) and negative at the \$11,604 upper endpoint (-0.646, $SE = 0.031$, one-sided $p < .001$), satisfying the formal endpoint U-shape condition across the full observed range. Yet at the 25th and 75th percentiles (\$25 and \$300), the estimated slopes are already negative (-0.104 and -0.321). Because the median reward-tier value is \$75, demand is declining across the central observed range. The interacted specification's approximate fitted peaks (\$12 for nonphysical tiers and \$3.5 for physical tiers) should be interpreted with the same caution.

4.9 Limitations

The findings should be interpreted with several limitations in mind. The observational design estimates conditional associations, not causal effects; campaign quality, creator resources, and unobserved audience differences may influence both reward design and outcomes. The physical-reward classification measures tangibility, not production cost, quality, or backer perceptions. Kickstarter is a reward-based marketplace

in which backers choose and pay for listed rewards, rather than a setting of unconditional charitable thank-you gifts; the results should therefore not be treated as direct estimates for conventional nonprofit giving. Finally, the targeted social-impact search, keyword-based theme assignment, record deduplication, and February 8-May 26, 2026 collection period limit reproducibility and generalizability. The robustness checks reduce, but do not eliminate, the possibility of residual selection or specification sensitivity.

4.10 Summary of Results

Overall, descriptive and baseline regression results show a positive conditional association between physical reward availability and the principal campaign outcomes. After controlling for logged tier count, the physical-reward coefficients are not statistically distinguishable from zero. For logged pledged amounts, the interaction model implies a negative physical-gift association at one and two reward tiers and a positive association from roughly three tiers onward; this is a conditional pattern, not evidence that rewards themselves caused the difference.

Within campaigns, physical tiers are positively associated with logged backer demand. The value-share interaction remains positive for the physical-tier association through the 5th-95th percentile range. The pooled price model has a \$7.11 turning point (95% CI: \$4.61-\$10.73); its central observed range is downward sloping, so it should not be described as evidence for a universally optimal price.

CONCLUSION

This study examined how physical reward tiers relate to backer behaviour in a descriptive dataset of 2,034 Kickstarter social-impact campaigns; the revised continuous-outcome campaign regressions use 2,025 observations with complete covariates. Because Kickstarter rewards are chosen and paid for, the evidence speaks to reward-based crowdfunding rather than directly to unconditional charitable giving.

Baseline campaign models show positive conditional associations between physical reward availability and pledged amount, backers, and average donation. Once logged tier count is included, none of the three physical-reward coefficients is statistically distinguishable from zero. The interaction estimates show that associations vary with reward-menu size; the reported coefficients should be interpreted through marginal effects at observed menu sizes, not as a stand-alone effect at an impossible zero-tier menu.

At the tier level, physical tiers are associated with higher logged backer demand within the same campaign. The pooled quadratic model has a fitted turning point of \$7.11 (95% CI: \$4.61-\$10.73); because the interquartile price range is \$25-\$300, the fitted relationship is declining across the central observed range. These results describe tier demand and do not identify a separate psychological crowding-out mechanism.

The practical implication is cautious. The positive baseline association of physical rewards with campaign outcomes is absorbed once menu size is controlled, so these data do not establish an independent

physical-reward advantage. The pooled quadratic turning point is far below the value of a typical tier, so the price result is best described as demand that declines across the central observed range, not as a recommendation to centre a menu on mid-priced tiers. Traditional non-profits should also be cautious when importing marketplace-style rewards because their donors may experience a thank-you gift differently from Kickstarter backers who select and pay for a tier.

Future research could address the remaining limitations by using a controlled field experiment to establish causation, classifying rewards by monetary value to test whether reward quality moderates observed associations, and replicating the analysis on a dedicated charitable crowdfunding platform where the altruistic frame is more pronounced. A further question is how reward quality, delivery terms, and price jointly relate to backer demand; answering it would help practitioners design tiers without attributing observed price patterns to a specific motivational mechanism.

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