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Abstract

We study charitable giving within social groups. Exploiting a unique dataset, we establish three key relationships between social group size and fundraising outcomes: (i) a positive relationship between group size and the total number of donations; (ii) a negative relationship between group size and the amount given by each donor; (iii) no relationship between group size and the total amount raised by the fundraiser. We rule out classic free-riding to explain these relationships since the number of social group members is only a subset of total contributors. Instead, the findings are consistent with the notion that giving in social groups is motivated by "relational" warm glow.

JEL-Code: D640, Z100, H310.

Keywords: online giving, fundraising, social groups, donations, charity, warm glow.

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1 Introduction

Donations by individuals are an important source of income for charities – $229 billion was donated in the US in 2012 and £10 billion in the UK – yet underlying individual motives for giving are not well understood. One possibility is that donors are motivated to give for altruistic reasons; that is, they care about the total amount of public good that is provided. Another is that donors give because they gain direct utility from the act of giving; that is, they experience a "warm glow" from giving (Andreoni, 1990). There is also interest in how donations may be determined in a "charity market" (List, 2011) where donors interact with other key players, including fundraisers and/or charities who are active in seeking donations through their own fundraising efforts. In this paper, we consider the situation where the fundraiser has existing personal relationships with potential donors and how such relationships may affect donations. This is important in practice since a lot of charitable giving takes place in social settings unrelated to charitable activity – in the UK, for example, 18% of donors report having sponsored family and friends for charity, while 13% gave in the workplace.[2] In such settings, existing personal relationships are likely to affect giving behaviour; Table 1 summarizes donors' perceptions of which factors are important determinants of how much they gave in response to an individual fundraiser showing that the personal relationship between the donor and the fundraiser comes near the top of the list, well above tax incentives, for example.

We propose the idea of a "relational" warm glow motivation for giving in social group settings – that is, a motivation to give that comes from a donor's altruism towards a member of their social group who engages in individual fundraising activities and who experiences a warm glow from the amount of money that is raised from their fundraising effort. This kind of individual-led fundraising has become very popular, at least in the UK (21 million individual fundraisers using the leading website since 2001), and is an important source of fundraising income for many charities. The basic idea is that individuals engage in fundraising activities – anything from running a marathon to shaving their head – in order to raise money for their chosen charity. A key feature is that fundraisers typically exploit their existing social networks, asking their friends, family and colleagues to sponsor them and make a donation. We explore giving in this social group setting empirically, exploiting a unique dataset of individual-led fundraising activity that links the donations

[2] Source: Citizenship Survey, 2008-09 (Department for Communities and Local Government, 2009)

that are made to individual fundraisers' online fundraising pages to an observable proxy for the size of the fundraisers' social group.

We have a very rich dataset comprising all donations made to nearly 40,000 fundraising pages; importantly, our data also contain information about the number of Facebook friends of the fundraisers. While the number of Facebook friends cannot be taken to be the universe of the fundraiser's entire social group, we find compelling evidence to support the idea that it is a meaningful proxy. We see in our data that the size of social groups varies enormously across fundraisers – at the 10^{th} percentile of the distribution, a fundraiser has 82 Facebook friends, while at the 90^{th} percentile, the number is 701. We are interested in how this variation in social group size affects donations both theoretically and empirically. Importantly, our data also contain key characteristics including the fundraisers' age, income and gender which allow us to control for factors that might be correlated with both social group size and giving behaviour

We find strong evidence that social group size matters. Controlling for age, income and gender, the number of Facebook friends of the fundraiser is positively correlated with the number of donations to the page, but there is a negative correlation between the number of Facebook friends and the size of donations. We can rule out that, in larger groups, marginal donors give less since the negative relationship applies even to the largest donation on the page. Ours is therefore a robust finding that donors in larger social groups give less. On the surface, it would seem that this finding fits the predictions of the basic model of non-cooperative giving (as developed by Bergstrom, Blume and Varian, 1986). But, this conclusion is unwarranted as there is no reason to think that the number of Facebook friends of any particular fundraiser is correlated with the total number of contributors to the public good. The most popular charity for which people fundraise is Cancer Research UK, which receives nearly £100 million in donations each year – completely dwarfing the amount raised by any individual fundraiser. Thus, there is no reason to think that the basic model can explain the negative correlation that we see in our data.

An alternative model of giving that could be invoked to explain the empirical results is one where giving is motivated by a "relational" warm glow – fundraisers experience "warm-glow" from the donations they raise, and the fundraisers' Facebook friends are altruistic towards the fundraisers. In such a model, fundraising success is a "local" public good to the social group and thus a public good for which incentives will vary locally with social group size. In this case, personal relationships become crucial to explaining motives for giving.

Our paper builds on the existing literature on the relationship between group size and private contributions to public goods, but adds to it along several important dimensions. Models of the non-cooperative private provision of public goods that are based on collective consumption motives predict that individual donations are negatively related to the total number of contributors, i.e. there is free-riding, and that individual contributions approach zero as the number of contributors become very large.[3] This result has been tested in a laboratory setting (Isaac and Walker, 1988; Isaac et al, 1994) and in a real world setting (Zhang and Zhu, 2010). In our case, however, the groups we look at are primarily social in nature; their primary purpose for interaction is not charitable activity. Second, as mentioned above, the members of the social group are only a subset of the total number of potential contributors to the public good, implying that any group size effect on public good provision will be a 'local' one, specific to the amount of public good funded by a subset of contributors. Thus, the situation that we study is of how socially-determined divisions of the universe of private contributors to a public good, along lines that are not directly relevant to the nature of the public good, can determine donation outcomes.

Our paper also proposes an analytical framework that supports our evidence, generating predictions about the effect of relational warm glow motives for giving on donation size. There is little theoretical literature focusing on donations in these social group contexts. Exceptions are Benabou and Tirole (2006) who consider the case where people make contributions out of concerns for reputation or status and Scharf (2014) who focuses on the effect of the structure of social interactions on giving decisions. However, numerous empirical studies support the presence of social effects on giving. Among other things, donations have been found to be sensitive to: whether or not giving is publicly observable (Soetevent, 2005); social information and norms (Frey and Meier, 2004; Shang and Croson, 2008); social pressure (DellaVigna *et al.*, 2012); and peer effects in solicitations and donations (Meer, 2011; Smith *et al.*, 2012). Many of these social effects are likely to interact with social group size, yet, to date, the sensitivity of donations to the size of social groups has not been explored. This paper extends this literature by presenting new evidence on the relationship between social group size and donations.

The plan of the rest of the paper is as follows. The next section discusses the individual fundraising context in more detail. Section 3 introduces the idea of relational warm glow and

[3] This result is dampened if there are impurely altruistic motives for giving (Andreoni, 1990).

discusses mechanisms through which social group size may affect donation size. Section 4 describes the data and Section 5 presents the main results. Section 6 concludes with a discussion of the findings.

2 The individual fundraising context

Alongside traditional fundraising activities, which involve a direct approach from a charity to potential donors, the past decade has witnessed a huge growth in individual-led online fundraising in the UK. Since 2001, more than 21 million individual fundraisers have raised in excess of £2 billion through online fundraising via the leading website, JustGiving.com.

The way this type of fundraising activity works is as follows: individual fundraisers choose a charity for which to raise money and a fundraising event, such as running a marathon or shaving their head. These events can be very personal or can be mass participation events in which they raise money alongside other fundraisers. Fundraisers then set up a personalized webpage on a fundraising website that allows donors to give online and then they solicit donations. Fundraisers do this primarily by appealing to their existing social networks of friends, family and work colleagues. In a survey of more than 19,000 users of JustGiving.com,[4] 84% of those asked for a donation had been asked by a family member (of whom 87% said that they always gave when asked); 96% had been asked by a friend (67% always gave); 89% had been asked by a colleague (48% always gave) and 70% had been asked by a charity representative (only 9% always gave). In this setting, it is highly likely that existing personal relationships between the fundraiser and the donor affect donations and this is supported by the factors cited by donors as influences on their giving, summarized in Table 1.[5]

Such individual-led fundraising has a double attraction for charities. First, it is cost-effective since charities do not need lists of potential donors, with individual fundraisers exploiting their existing social groups. Second, personal solicitations can be highly effective in encouraging donations, more so than solicitations from charity fundraisers (Meer, 2011). This may be because

[4] See Payne et al (2012).

[5] The context of online fundraising has been used previously to study peer effects in giving (Castillo, Petrie and Wardell, 2014; Smith et. al., 2014), endogenous anonymity (Peacey and Sanders, 2013), and competition in fundraising (Payne, Scharf and Smith, 2014). However, the relationship between the size of the fundraiser's social group and how much is donated has not been studied and this is the focus of this paper.

there is an endorsement of the charity, similar to the effect of a large, lead donation (Vesterlund, 2003), it may also be because of the personal nature of "the ask". In practice, however, the size of social groups will vary widely across individual fundraisers. Some will have a very large circle of friends, family and work colleagues that they can solicit; others will have much narrower social groups. The question of interest in this paper is how this kind of variation in social group size affects donors' behaviour.

3 Relational warm glow

We begin with a brief overview of the standard model of private giving, in which N individuals make private contributions to a public good in a non-cooperative fashion (Warr, 1983; Bergstrom et. al., 1984).

Suppose that all individuals each have an exogenously given income y, and that they each consume a private good and a pure public good in amounts respectively equal to x and G, with G being funded with individual private contributions, v. Preferences are identical across individuals and are represented by an increasing, strictly concave utility function, $U(x,G)$. As is standard in this literature, assume that both the private good and the public good are strictly normal goods, that the public good and private good are measured in the same units, and that the marginal rate of transformation between the public good and the private good in production is unity. The individually optimal contribution by donor $i \in \{1,...,N\}$ maximizes $U\left(y - v^i, v^i + \sum_{j \neq i} v^i\right)$ where, $\sum_{j \neq i} v^i$ represents donations by other individuals. This yields the interior first-order condition $-U_x\left(y - v^i, v^i + \sum_{j \neq i} v^i\right) + U_G\left(y - v^i, v^i + \sum_{j \neq i} v^i\right) = 0$; which, in a symmetric equilibrium with $v^i = v^*$ for all $i \in \{1,...,N\}$ and $G^* \equiv Nv^*$, can be re-written as

$$-U_x\left(y - v^*, Nv^*\right) + U_G\left(y - v^*, Nv^*\right) = 0. \qquad (1)$$

Note that the level of provision in this equilibrium is inefficient – the optimal provision level is characterised by the Samuelson condition, $N\ \mathrm{MRS}_{Gx} = 1$, while (1) gives $\mathrm{MRS}_{Gx} = 1$; since MRS_{Gx} is decreasing in x/G, this implies under-provision.

Totally differentiating (1) with respect to v^* and N, we obtain

$$\frac{dv^*}{dN} = \frac{v^*\left[U_{xG}\left(y-v^*, Nv^*\right) - U_{GG}\left(y-v^*, Nv^*\right)\right]}{U_{xx}\left(y-v^*, Nv^*\right) - U_{Gx}\left(y-v^*, Nv^*\right) - N\left[U_{xG}\left(y-v^*, Nv^*\right) - U_{GG}\left(y-v^*, Nv^*\right)\right]}. \quad (2)$$

The denominator of the ratio on the right-hand side of the above is negative by concavity, and the numerator is positive, making dv^*/dN negative. This basic framework thus predicts that as N becomes large, individual contributions, $v^*(N) = G^*(N)/N$, go to zero; that is, there is free-riding. The effect of an increase in N on the total volume of contributions is

$$\frac{dG^*}{dN} = v^* + N\frac{dv^*}{dN}. \quad (3)$$

This is negative if contributions are sufficiently elastic with respect to N, i.e. if dv^*/dN is sufficiently large in absolute value.

In our empirical analysis we find a weakly negative correlation between the number of Facebook friends of fundraisers and the size of donations and little correlation between social group size and total contributions to the page. At first sight, it would seem that this finding fits the predictions of the basic model. Upon closer inspection, however, this conclusion is unwarranted. To see this, partition individuals in the economy so that $N = N_F + N_E$, where N_F is the number of Facebook friends of a fundraiser, and N_E is the number of other donors not belonging to the group of friends. In our data, we observe N_F but not N_E – and thus not N – and there is no reason to think that the total number of contributors to the public good should be correlated to the number of people that are Facebook friends of a particular fundraiser. That is, there is no reason to think that the basic model can explain the correlations that we see in our data.

An alternative specification that could be invoked to explain the empirical results is one where fundraisers experience "warm-glow" from the donations they raise, and where the members of the fundraisers' social group are altruistic towards the fundraiser, which makes fundraising success a "local" public good to the social group – and thus a public good for which incentives will vary locally with N_F.

Formally, if fundraising success within the social group is measured by $N_F v_F \equiv V_F$ and total donations are $G = N_F v_F + G_{-F}$ (with G_{-F} representing donations by individuals outside the group),

we can write the objective of individual Facebook friends as $U(x, G, V_F)$ with $U(\bullet)$ again strictly concave in its arguments. The first order condition is

$$-U_x\left(y-v^*, G_{-F}+N_F v_F^*, N_F v_F^*\right)+U_G\left(y-v^*, G_{-F}+N_F v_F^*, N_F v_F^*\right) \quad (4)$$

$$+U_{V_F}\left(y-v^*, G_{-F}+N_F v_F^*, N_F v_F^*\right)=0.$$

Here provision of V_F depends only on N_F and not on N_E, whereas provision of G depends on both N_F and N_E. In this specification, even though there is still no reason to assume that the total number of contributors to G is related to the number of Facebook friends, the total number of contributors to V_F will be related to the number of Facebook friends, and thus, through this channel, we can expect a negative correlation between v_F and N_F, and possibly, a negative correlation between V_F and N_F.[6]

In sum, although we can rule out standard free-riding behaviour, a relational warm glow from the donor to the fundraiser (where the donor cares directly about the fundraiser and/or how much the fundraiser raises) provides one plausible channel for donations being lower in larger social groups. In the rest of the paper, we explore these relationships empirically.

3 Data

Our sample for analysis comprises 566,240 donations made to 39,238 pages where the fundraiser linked their fundraising page to their Facebook page. This is after some cleaning. We remove 3,817 pages where we cannot identify the charity registration number for England and Wales. We also drop 30 pages with zero friends and 364 with zero amounts donated. We remove outliers, including pages with individual donations of £170+ (top 1%), pages which raised £3,241+ (top 1%) and pages with fundraising targets of £100,000 or more (37 pages).

We have all information that is publicly available on the fundraising pages. This includes the name of the charity, whether or not there is a fundraising target, the number of donations and the total amount raised. We also have information on all the donations made online to the pages,

[6] This can be derived by total differentiation of (4) with respect to v_F^* and N_F, as we did earlier for the basic model.

including the date the donation was made, the amount given and the name of the donor where available (just over 7% of donations are made anonymously).

Table 2 provides basic summary statistics for the cleaned sample. A typical page has ten donations and raises just over £130 in total. The majority of pages have a fundraising target – typically £300. We discuss below how target-setting responds to group size and may in turn affect donation behaviour; in our analysis we look separately at pages without fundraising targets as a robustness check. In this setting, the main role of the targets is to signal how much money the fundraiser wants to raise. The targets are not binding (unlike the case of crowd-funding, for example) and donations are made irrespective of whether or not that target is reached. The fundraiser's target is also not typically linked to the funding of specific projects; instead the money raised usually provides the charity with general funds.

Table 2 also provides information on the number of Facebook friends in our sample of fundraisers. Figure 1 compares the (mean) number of Facebook friends among fundraisers with the (mean) number of Facebook friends in the wider population. For the youngest age group (aged 18 – 34), the number of Facebook friends in the JustGiving sample is broadly representative of the population. This implies that these individuals do not only link their fundraising page to a Facebook page when they have an above-average number of friends. Older fundraisers look more selected in terms of the number of their Facebook friends – this may be selection into fundraising or into linking to Facebook. As a robustness check, we repeat our analysis only on the younger group of fundraisers.

JustGiving.com classify individual fundraising activities into different types. Most involve sporting activities. Running events (particularly marathons) are the most common (39.5% pages), followed by Walking (14.8%) and Cycling (11.4%). Other specified sporting events include Parachuting (2.3%), Swimming (1.8%) and Triathlon (1.6%). Non-sporting activities include Memorials (3.9%), Appeals (0.5%) and Anniversaries, including weddings and birthdays (0.3%). There is also a substantial category of "other" activities (24.0%). Table 3 shows variation in fundraising behaviour (donation size, number of donations and total amounts raised) across these different event types. Individuals doing triathlons typically attract the largest number of donations and raise the most money in total. Anniversaries are associated with the largest (mean) amounts donated.

JustGiving.com also collects additional demographic information on fundraisers including their gender, their age and their household income, based on a household-specific market research classification. Table 3 shows that there is variation in fundraising behaviour – and number of Facebook friends – across these characteristics; our main empirical results therefore include these characteristics as controls in looking at the relationship between group size and donations.

4 Main findings on social group size and donations

We are interested in modeling the relationship between social group size and donations. We define N_F as the number of Facebook friends of fundraiser F, our measure of social group size. We are interested in three donation outcomes. The first is the total number of donations, n_F, received by the fundraiser ($n_F \leq N_F$). The second is the amount of money given by each individual i (with g_{iF} being the contribution of donor i to fundraiser F's fundraising page). The third is the total amount raised by the fundraiser, $G_F = \sum_F g_{iF}$. The key relationships between social group size and these three different donation outcomes are presented in Figure 2 and explored further in a series of regressions. In the analysis we focus only on fundraisers with fewer than 500 friends.[7]

For outcomes at the fundraising page-level, y_F (the total number of donations, total amount raised), we estimate the following specification:

$$y_F = \alpha + \beta N_F + \vec{\gamma}_1^{\mathrm{T}} \vec{X}_F + \mu_F, \tag{5}$$

where α, β and γ are the parameters to be estimated; $\vec{X}_F$ is a vector of controls for the characteristics of the fundraiser and the fundraising page, including age, household income and gender of the fundraiser and whether the fundraising page has a target, charity size, overseas charity and event type; and μ is the error term. We also include a set of month and year dummies.

For outcomes at the donor level, y_{iF}, (contribution size), we estimate the following specification:

$$y_{iF} = \alpha + \beta N_F + \vec{\gamma}_1^{\mathrm{T}} \vec{X}_F + \vec{\gamma}_2^{\mathrm{T}} \vec{Z}_{iF} + \varepsilon_{iF}, \tag{6}$$

[7] Since Dunbar (1992) this has been seen as a maximum number of plausibly meaningful relationships.

where Z_{iF} includes additional controls for the gender of the donor[8] and whether the donation is made anonymously, and where ε is the individual specific error term. We cluster standard errors at the page level.

The results for all three donation outcomes are reported in Table 4. Column (I) presents specifications that include only the number of Facebook friends. Column (II) adds the additional controls. We also allow for non-linearities in the relationship between group size and donation outcomes (Column (III)).

We find that the number of donors is positively correlated with group size, although the magnitude is small. Focusing on the specification in column III, the results imply that moving from the 10th to the 50th percentile in the distribution of Facebook friends (from 82 to 250 friends) translates into just over one extra donation. This small effect may reflect the fact that an individual's Facebook network is typically larger than their real world social network – closer friends, family and colleagues who may be more likely to respond to a solicitation for donations. Nevertheless, the result indicates that the number of Facebook friends picks up something meaningful about an individual's social group size that affects donor behaviour.

Contribution size is negatively correlated with group size. The magnitude of the estimated coefficient implies that moving from the 10th to the 50th percentile in the distribution of Facebook friends of the fundraiser reduces the average amount given to a page by £3.00 on average. In this specification, the coefficient measures the effect of the fundraiser's social group size on the *average* contribution size to the fundraiser's page. This may be affected either by changes in donation size among all donors to a page and/or by changes in the marginal donor: If more people give in larger social groups, the marginal donor may give less, reducing the average. To shed light on this, we look at the relationship between group size and the maximum donation to each page. We also look at the relationship between the amount given and group size by order of the donation on the page – selecting only the first donations to a page, the second donations to a page and so on, up to the fifth. Showing that a negative relationship is present even for the first donation to each page is important since later donations may be affected by how much has previously been given (Smith et. al., 2013). The results are reported in Table 4. We find that the negative relationship holds in all cases. There is a negative relationship between social group size and the size of the first donation to each fundraising page (as well as the size of the second, third, fourth and fifth donations). The size of the

[8] We use the donor's name to assign gender.

largest donation to each fundraising page is also smaller in larger social groups. Taken together, we find this to be very strong evidence that donations are smaller in larger social groups.

Our final outcome is the total amount raised. We find no significant relationship with social group size, suggesting that the effect on the number of donations and the effect on donation size roughly cancel out. Below, we show that this relationship holds for pages both with and without targets.

To what extent can we treat group size as exogenous and so interpret these as causal relationships? The advantage of using the number of Facebook friends at the start of the fundraising campaign size is that it will not be affected by individual fundraising activity. The only exception would be if individuals proactively added to their Facebook friendship networks prior to beginning fundraising. We cannot rule this out but we consider it to be unlikely. More plausibly, the number of Facebook friends may be correlated with other characteristics of the fundraiser and/or their donors that also affect donations to the page (for example, young people typically have more friends and may also have younger friends who give less). However, our results are robust to controlling for key fundraiser characteristics which proxy for donor characteristics under the assumption of network homophily.

It is possible that there are other characteristics of the fundraiser or the members of their social group that we cannot control for and that may be correlated with both the number of Facebook friends (social group size) and how much is donated. The literature suggests a number of potential candidate factors that affect social group size including popularity (Conti et. al., 2012), narcissism (Carpenter, 2012) and brain size (Kanai et. al., 2012), but none of these plausibly explains the strong negative relationship between group size and contributions. We therefore interpret our findings as saying something meaningful about the effect of group size on donations to the fundraising page.

Finally, we also investigate the role of target setting and the relationship with group size. The results are reported in Table 6. Column I shows that target-setting is more likely in larger social groups, which is a reasonable response if fundraisers anticipate more free-riding, while Column II shows that the target amount is not affected by the group size. Columns III and IV show that social group size has a negative effect on the probability that the target is met and the proportion of the target that is reached. This is also consistent with greater free-riding and it being harder to co-ordinate behaviour across donors in larger social groups. Columns V-VII show that there is no significant difference in the relationship between donation behaviour and social group size across

pages with and without a target. This means that the observed relationships between giving and group size cannot be explained by the presence of targets.

5 Discussion

This paper has provided novel and robust evidence on the effect of social group size on private contributions to public goods in a real world setting. We have a strong finding that contributions are smaller in larger social groups, even when we control for characteristics such as age and income that are likely to affect both social group size and contribution size. We can rule out that this is attributable to free-riding on (total) public good provision. Instead we have shown that the negative correlation is consistent with a relational warm glow motivation for giving where donors are altruistic towards fundraisers and fundraisers, in turn, care about the total amount of money they raise. In this setting, donations are motivated not (just) by the desire to contribute to the public good, but also by the personal relationship between fundraiser and donor.

We do not rule out that other explanations might also be relevant in this context. For example, a number of studies have suggested that donations may be motivated by a desire to signal generosity or wealth (Glazer and Konrad, 1996; Harbaugh, 1998). This is relevant to online fundraising where most donations are public and are visible to other (subsequent) donors as well as to the fundraiser. In this case, however, it seems likely that there would be a positive effect of social group size on donation size since there would be a higher return to signalling to a larger group, i.e. there would be a race to the top. Another possibility is that the extent to which donors experience relational warm glow may depend on the strength of the personal relationship between the donor and the fundraiser which may be weaker in larger social groups simply because the fundraiser has less time and effort to devote to each member of the social group. We consider this to be highly likely, although we cannot test it directly with these data. We would regard this as a complementary rather than a competing mechanism that would tend to strengthen the relational warm glow in smaller groups. It would tend to confirm that the social dimensions of giving and, more specifically, personal relationships play a significant role in shaping donation choices. It also indicates that research on the social dimensions of giving should take account of pre-existing structures of social relationships that will affect giving behaviour.

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Figure 1: Mean number of Facebook friends (by age)

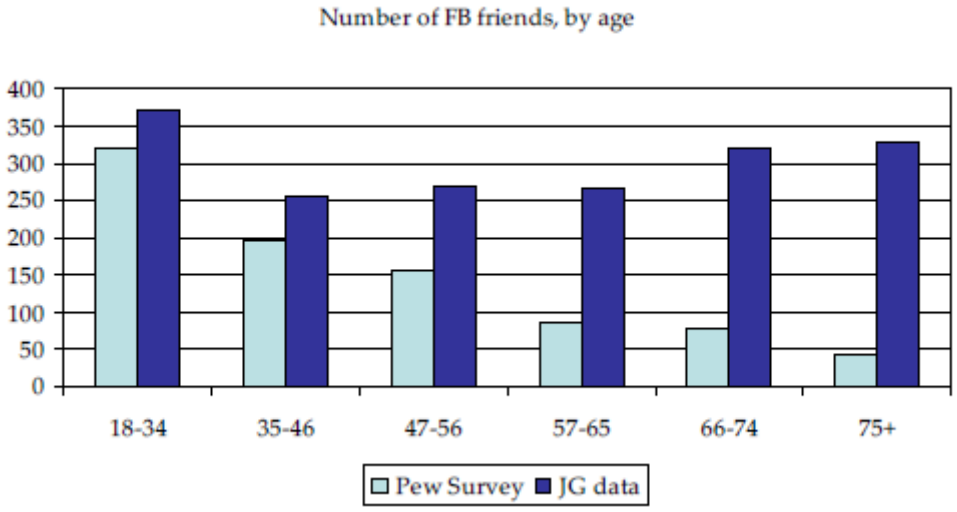
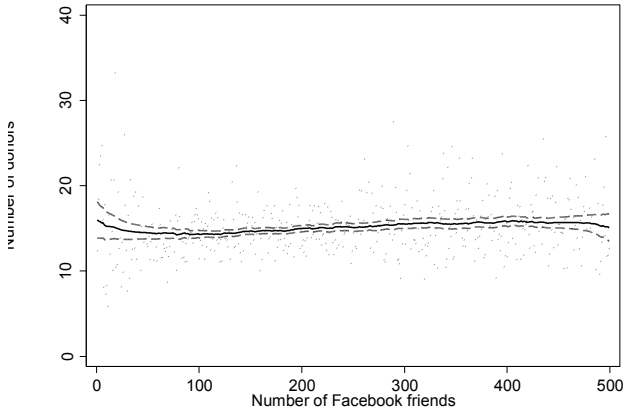
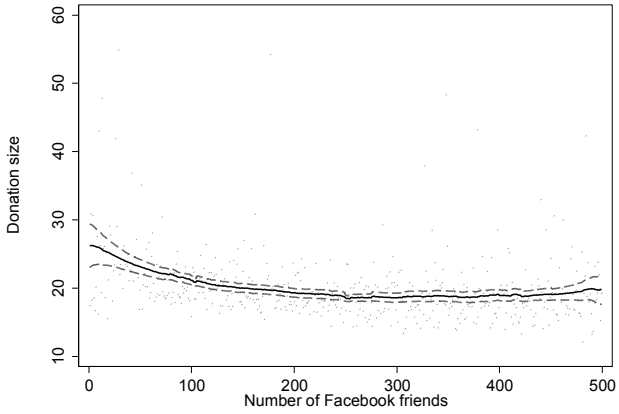


Figure 2: Relationship between social group size and donations

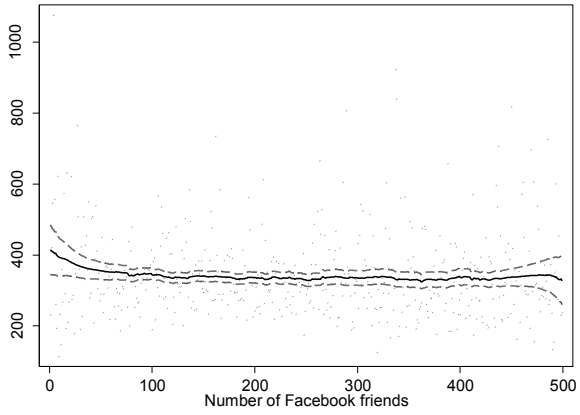
Number of donations per page



Mean donation size (£)



Total amount raised (£)



These figures plot the means of the total number of donations per page, donation size and total amount raised per page, by number of facebook friends (shown by the scatter points), together with smoothed running lines and confidence intervals.

Table 1. Which factors are important in deciding how much to give?

	Very important	Somewhat important	Not very important	Not at all important	Not applicable
A sense that my money will be used efficiently/ effectively	56.1%	35.0%	6.9%	1.6%	0.6%
The charity's cause or mission	45.1%	44.1%	8.4%	1.9%	0.6%
My income and what I can afford	45.3%	42.3%	9.0%	2.5%	0.8%
A personal connection to the fundraiser	41.5%	43.4%	10.6%	3.5%	1.1%
The fundraiser's reason for fundraising	38.0%	48.0%	10.1%	3.0%	1.0%
The reputation of the charity	32.7%	47.5%	15.3%	3.4%	1.0%
Tax relief (i.e. Gift Aid)	21.7%	34.8%	23.5%	14.3%	5.8%
Type of fundraising event	14.4%	45.8%	29.8%	8.6%	1.5%
The name of the charity	14.1%	39.4%	32.5%	12.1%	1.9%
The total amount the fundraiser is seeking to raise	3.3%	28.0%	38.9%	24.9%	5.1%
How much other people have given to the fundraiser	2.7%	21.6%	39.0%	33.1%	3.7%
An individual amount suggested by the fundraiser	1.4%	15.9%	39.6%	29.9%	13.2%

Note to table: These responses are from a survey of JustGiving users carried out in 2012. The relevant sample for this question was 17,989 people who had previously sponsored a fundraiser

Table 2. Sample summary statistics

	Mean	St. dev.	Min.	1st pctile	Med.	99th Pctile	Max.
Number of donations per page	14.5	16.5	1	1	9	79	308
Total raised online per page	£347.4	£831.9	£2	£5	£134	£2,200	£3,222
Online donations	17.7	18.2	1	2	10	100	170
Prop. of pages with target	0.719						
Target amounts	£719.4	£2480.6	£0.1	£50	£300	£5,000	£100,000
Number of friends	329.1	316.2	1	24	251	1,410	5,695
Number of pages	39,238						
Number of donations	566,240						

Table 3: Variation in fundraising

	Proportion of sample	Number of donations	Total amount raised (£)	Mean donation (£)	Number of friends	Source of data
Male fundraiser	0.473	16.2	328.6	18.3	342.6	Information from
Female fundraiser	0.526	13.0	246.4	16.9	315.2	Justgiving
FR Age						
18-25	0.149	13.1	231.6	15.6	481.5	Age classification
26-30	0.172	14.4	265.5	16.7	361.6	based on postcode
31-35	0.149	15.6	300.0	17.6	311.8	and address
36-40	0.166	15.0	303.0	18.1	266.3	
41-45	0.137	14.6	304.9	18.7	273.5	
46-50	0.094	14.5	312.0	19.0	297.0	
51-55	0.050	14.4	313.5	19.2	276.2	
56-60	0.028	14.6	301.7	18.7	255.5	
61-65	0.018	13.4	289.2	19.4	304.7	
66-70	0.012	13.6	282.5	17.8	314.8	
71-75	0.007	13.2	261.1	17.5	317.8	
76+	0.018	15.5	296.9	17.1	335.0	
FR Hhold income						
<£10K	0.071	12.3	215.5	15.7	372.4	Income
£10K-£15K	0.036	12.1	213.6	15.9	403.2	classification based
£15K-£20K	0.151	13.0	235.4	16.0	367.0	on postcode and
£20K-£25K	0.178	13.2	247.6	16.7	333.3	address
£25K-£30K	0.164	14.1	267.4	17.0	315.8	
£30K-£40K	0.120	15.3	299.9	17.5	302.2	
£40K-£50K	0.078	15.4	305.8	18.0	300.2	
£50K-£60K	0.120	16.7	358.0	19.3	295.3	
£60K-£75K	0.064	18.2	436.3	21.6	313.9	
£75K+	0.016	21.1	526.8	23.2	316.9	
Event type						
Anniversaries	0.003	12.5	361.8	26.9	260.3	Justgiving
Appeals	0.006	12.0	216.3	15.4	416.3	classification
Memorials	0.038	17.3	386.0	19.3	349.9	
Cycling	0.113	13.8	282.3	18.7	269.1	
Parachuting	0.024	12.5	220.8	15.9	406.7	
Running	0.376	15.9	304.8	17.6	329.4	
Swimming	0.018	13.3	231.3	16.6	283.7	
Walking	0.170	10.8	212.6	17.1	283.7	
Triathlon	0.013	19.7	433.1	20.3	299.0	
Other	0.239	15.0	303.9	17.5	391.6	
Donor gender						
Male	0.311			20.0		Assigned based on
Female	0.393			15.3		donor's first name
Anonymous	0.073			12.8		
Unknown	0.222			20.5		

Table 4. Main regression results (OLS regressions)

	Ln(Number donations)			Ln (Total amount raised)			Ln (Donation size)		
	(I)	(II)	(III)	(I)	(II)	(III)	(I)	(II)	(III)
Friends/100	0.027***	0.040***	0.077***	-0.051***	-0.031***	-0.074***	-0.021***	0.005	-0.030
	(0.004)	(0.005)	(0.019)	(0.003)	(0.003)	(0.011)	(0.006)	(0.006)	(0.024)
(Friends/100)^2			-0.007			0.008***			0.007
			(0.003)			(0.002)			(0.004)
Male FR		0.154***	0.155***		0.041***	0.041***		0.252***	0.251***
		(0.012)	(0.012)		(0.007)	(0.007)		(0.015)	(0.015)
Target (0/1)		0.398***	0.398***		0.047***	0.048***		0.468***	0.469***
		(0.013)	(0.013)		(0.007)	(0.007)		(0.016)	(0.016)
Age 26-30		0.163***	0.160***		0.042*	0.045*		0.193***	0.196***
		(0.023)	(0.023)		(0.018)	(0.019)		(0.029)	(0.029)
Age 31-35		0.236***	0.233***		0.077***	0.082***		0.289***	0.292***
		(0.023)	(0.023)		(0.019)	(0.019)		(0.029)	(0.029)
Age 36-40		0.203***	0.201***		0.071***	0.074***		0.261***	0.263***
		(0.023)	(0.023)		(0.019)	(0.019)		(0.029)	(0.029)
Age 41-45		0.132***	0.133***		0.084***	0.085***		0.207***	0.207***
		(0.024)	(0.024)		(0.019)	(0.019)		(0.030)	(0.030)
Age 46-50		0.185***	0.187***		0.113***	0.112***		0.302***	0.300***
		(0.026)	(0.026)		(0.021)	(0.021)		(0.033)	(0.033)
Age 51-55		0.142***	0.144***		0.119***	0.118***		0.251***	0.248***
		(0.031)	(0.031)		(0.026)	(0.026)		(0.040)	(0.040)
Age 56-60		0.221***	0.225***		0.134***	0.132***		0.365***	0.362***
		(0.039)	(0.039)		(0.025)	(0.025)		(0.049)	(0.049)
Age 61-65		0.137**	0.140**		0.175***	0.172***		0.328***	0.325***
		(0.046)	(0.046)		(0.028)	(0.028)		(0.059)	(0.059)
Age 66-70		0.138*	0.139*		0.125***	0.123***		0.253***	0.252***
		(0.056)	(0.056)		(0.032)	(0.032)		(0.071)	(0.071)
Age 71-75		0.159*	0.159*		0.174*	0.174*		0.269**	0.268**
		(0.078)	(0.078)		(0.079)	(0.078)		(0.098)	(0.098)
Age 76+		0.229***	0.228***		0.107**	0.107**		0.344***	0.345***
		(0.047)	(0.047)		(0.034)	(0.033)		(0.059)	(0.059)
Inc_10-15K		-0.011	-0.011		0.009	0.0085		0.0100	0.009
		(0.040)	(0.040)		(0.025)	(0.024)		(0.050)	(0.050)
Inc_15-20K		0.028	0.028		0.023	0.023		0.0680	0.068
		(0.027)	(0.027)		(0.018)	(0.018)		(0.034)	(0.034)
Inc_25-30K		0.056*	0.0567*		0.056**	0.056**		0.123***	0.123***
		(0.026)	(0.026)		(0.018)	(0.018)		(0.033)	(0.033)
Inc_30-35K		0.129***	0.130***		0.054**	0.054**		0.205***	0.204***
		(0.026)	(0.026)		(0.019)	(0.019)		(0.033)	(0.033)
Inc_35-40K		0.236***	0.236***		0.092***	0.091***		0.346***	0.346***
		(0.028)	(0.028)		(0.018)	(0.018)		(0.035)	(0.035)
Inc_40-50K		0.253***	0.254***		0.110***	0.109***		0.389***	0.388***
		(0.030)	(0.030)		(0.019)	(0.019)		(0.038)	(0.038)
Inc_50-60K		0.301***	0.302***		0.179***	0.178***		0.517***	0.516***
		(0.028)	(0.028)		(0.018)	(0.018)		(0.035)	(0.035)
Inc_60-75K		0.458***	0.459***		0.309***	0.308***		0.801***	0.800***
		(0.032)	(0.032)		(0.020)	(0.020)		(0.041)	(0.041)
Inc_75K+		0.542***	0.544***		0.372***	0.369***		0.965***	0.962***
		(0.051)	(0.051)		(0.037)	(0.037)		(0.064)	(0.064)
Appeals		0.208	0.210		-0.464***	-0.467***		-0.381*	-0.382*
		(0.131)	(0.131)		(0.095)	(0.094)		(0.165)	(0.165)
Memorials		0.318**	0.318**		-0.154*	-0.155*		0.164	0.164
		(0.103)	(0.103)		(0.068)	(0.068)		(0.130)	(0.130)
Cycling		0.0693	0.069		-0.325***	-0.326***		-0.314*	-0.314*
		(0.100)	(0.100)		(0.064)	(0.065)		(0.126)	(0.126)
Parachuting		-0.006	-0.007		-0.365***	-0.365***		-0.389**	-0.388**
		(0.107)	(0.107)		(0.066)	(0.066)		(0.135)	(0.135)
Running		0.132	0.132		-0.348***	-0.349***		-0.290*	-0.290*
		(0.098)	(0.098)		(0.064)	(0.064)		(0.125)	(0.125)
Swimming		0.078	0.0791		-0.396***	-0.396***		-0.380**	-0.381**
		(0.107)	(0.107)		(0.068)	(0.068)		(0.135)	(0.135)
Walking		-0.089	-0.089		-0.349***	-0.349***		-0.566***	-0.566***
		(0.099)	(0.099)		(0.064)	(0.064)		(0.126)	(0.126)
Triathlon		0.454***	0.453***		-0.271***	-0.271***		0.156	0.157
		(0.111)	(0.111)		(0.067)	(0.068)		(0.140)	(0.140)
Other		0.072	0.072		-0.346***	-0.347***		-0.325**	-0.325**

		(0.099)	(0.099)		(0.064)	(0.065)		(0.125)	(0.125)
Med charity		-0.150***	-0.150***		-0.064**	-0.064**		-0.223***	-0.223***
		(0.027)	(0.027)		(0.021)	(0.021)		(0.035)	(0.035)
Large charity		-0.163***	-0.163***		-0.062**	-0.063**		-0.232***	-0.232***
		(0.026)	(0.026)		(0.019)	(0.016)		(0.032)	(0.032)
Major charity		-0.243***	-0.243***		-0.062**	-0.063**		-0.308***	-0.308***
		(0.026)	(0.026)		(0.019)	(0.019)		(0.032)	(0.032)
Size unknown		-0.105***	-0.105***		-0.031	-0.031		-0.117***	-0.117***
		(0.025)	(0.025)		(0.019)	(0.019)		(0.031)	(0.031)
Overseas char		0.020	0.0201		0.138***	0.139***		0.212***	0.213***
		(0.041)	(0.041)		(0.023)	(0.023)		(0.052)	(0.052)
Female					-0.250***	-0.250***			
					(0.004)	(0.004)			
Anonymous					-0.580***	-0.580***			
					(0.015)	(0.015)			
DK gender					0.010*	0.011*			
					(0.004)	(0.004)			
_cons	2.075***	1.362***	1.326***	2.755***	3.295***	3.339***	4.906***	4.692***	4.727***
	(0.0127)	(0.252)	(0.252)	(0.00882)	(0.157)	(0.158)	(0.0163)	(0.318)	(0.319)
N	32447	31135	31135	481291	462304	462304	32447	31135	31135

Standard errors, clustered at the page level, in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All regressions additionally include year and month dummies. For variable definitions, see Table 2.

Table 5. Robustness checks

Dependent variable = ln (Donation amount)

	Maximum donation	First donation	Second donation	Third donation	Fourth donation	Fifth donation
Friends/100	-0.080***	-0.127***	-0.105***	-0.093***	-0.079***	-0.094***
	(0.018)	(0.015)	(0.015)	(0.016)	(0.016)	(0.017)
(Friends/100)^2	0.014***	0.015***	0.011***	0.010**	0.008**	0.010**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.0037)
N	31135	31135	28422	26163	24148	22351

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All regressions include full set of controls as in Table 4.

Table 6. Target-setting behaviour

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
	Target (0/1)	Ln (Target amount)	Target_met (0/1)	Proportion target met	Ln(Number donations)	Ln (Total amount raised)	Ln (Donation size)
Friends/100	0.009***	0.0347***	-0.007**	-0.005**	0.040***	-0.028***	-0.000
	(0.002)	(0.006)	(0.002)	(0.002)	(0.009)	(0.005)	(0.011)
Friends/100_target					-0.000	-0.004	0.008
					(0.010)	(0.006)	(0.013)
Male_FR	0.045***	0.319***	-0.018**	-0.007	0.154***	0.041***	0.252***
	(0.005)	(0.014)	(0.006)	(0.004)	(0.012)	(0.007)	(0.015)
Age 26-30	-0.030**	0.082**	0.030**	0.035***	0.163***	0.042*	0.193***
	(0.009)	(0.027)	(0.011)	(0.008)	(0.023)	(0.018)	(0.029)
Age 31-35	-0.054***	0.143***	0.053***	0.053***	0.236***	0.077***	0.290***
	(0.010)	(0.028)	(0.011)	(0.009)	(0.023)	(0.019)	(0.029)
Age 36-40	-0.070***	0.174***	0.042***	0.033***	0.203***	0.071***	0.262***
	(0.009)	(0.027)	(0.011)	(0.009)	(0.023)	(0.019)	(0.029)
Age 41-45	-0.062***	0.193***	0.012	0.014	0.132***	0.084***	0.207***
	(0.010)	(0.029)	(0.012)	(0.009)	(0.024)	(0.019)	(0.030)
Age 46-50	-0.067***	0.273***	0.016	0.018	0.185***	0.113***	0.302***
	(0.011)	(0.032)	(0.013)	(0.010)	(0.026)	(0.021)	(0.033)
Age 51-55	-0.054***	0.231***	0.016	0.018	0.142***	0.119***	0.251***
	(0.013)	(0.038)	(0.016)	(0.012)	(0.031)	(0.026)	(0.040)
Age 56-60	-0.031	0.276***	0.010	0.035*	0.221***	0.134***	0.365***
	(0.016)	(0.046)	(0.019)	(0.015)	(0.039)	(0.025)	(0.049)
Age 61-65	-0.064**	0.299***	0.013	0.027	0.137**	0.174***	0.329***
	(0.020)	(0.057)	(0.024)	(0.018)	(0.046)	(0.028)	(0.059)
Age 66-70	-0.045	0.187**	-0.010	-0.023	0.138*	0.124***	0.254***
	(0.024)	(0.068)	(0.028)	(0.022)	(0.056)	(0.032)	(0.071)
Age 71-75	-0.034	0.357***	-0.023	-0.009	0.159*	0.174*	0.269**
	(0.033)	(0.094)	(0.039)	(0.031)	(0.078)	(0.079)	(0.098)
Age 76+	-0.005	0.237***	0.042	0.038*	0.229***	0.107**	0.345***
	(0.020)	(0.056)	(0.023)	(0.018)	(0.047)	(0.033)	(0.059)
Inc_10-15K	-0.004	0.018	-0.024	-0.019	-0.011	0.008	0.010
	(0.017)	(0.048)	(0.020)	(0.016)	(0.040)	(0.025)	(0.050)
Inc_15-20K	0.004	0.012	0.003	0.002	0.028	0.023	0.068
	(0.011)	(0.033)	(0.014)	(0.011)	(0.027)	(0.018)	(0.034)
Inc_25-30K	0.002	0.036	0.032*	0.025*	0.056*	0.056**	0.123***
	(0.011)	(0.032)	(0.013)	(0.010)	(0.026)	(0.018)	(0.033)
Inc_30-35K	0.001	0.038	0.035*	0.039***	0.129***	0.054**	0.205***
	(0.011)	(0.032)	(0.013)	(0.010)	(0.026)	(0.019)	(0.033)
Inc_35-40K	-0.000	0.093**	0.041**	0.060***	0.236***	0.092***	0.347***
	(0.012)	(0.034)	(0.014)	(0.011)	(0.028)	(0.018)	(0.035)
Inc_40-50K	0.031*	0.102**	0.067***	0.076***	0.253***	0.110***	0.389***
	(0.013)	(0.037)	(0.015)	(0.012)	(0.030)	(0.019)	(0.038)
Inc_50-60K	0.014	0.141***	0.102***	0.106***	0.301***	0.179***	0.517***
	(0.012)	(0.034)	(0.014)	(0.011)	(0.028)	(0.018)	(0.035)
Inc_60-75K	0.045**	0.343***	0.153***	0.157***	0.458***	0.309***	0.802***
	(0.013)	(0.039)	(0.016)	(0.012)	(0.032)	(0.020)	(0.041)
Inc_75K+	0.015	0.487***	0.168***	0.178***	0.542***	0.372***	0.964***
	(0.021)	(0.061)	(0.026)	(0.020)	(0.051)	(0.037)	(0.064)
Appeals	0.258***	0.430*	-0.080	-0.117*	0.208	-0.464***	-0.380*
	(0.055)	(0.174)	(0.073)	(0.057)	(0.131)	(0.095)	(0.165)
Memorials	0.063	0.368*	-0.076	-0.105*	0.318**	-0.155*	0.164
	(0.044)	(0.144)	(0.060)	(0.047)	(0.103)	(0.068)	(0.130)
Cycling	0.205***	-0.143	-0.072	-0.076	0.069	-0.325***	-0.314*
	(0.042)	(0.139)	(0.058)	(0.045)	(0.100)	(0.064)	(0.126)
Parachuting	0.326***	0.368*	-0.208***	-0.230***	-0.006	-0.365***	-0.388**
	(0.045)	(0.145)	(0.061)	(0.047)	(0.107)	(0.066)	(0.135)
Running	0.206***	-0.122	-0.062	-0.077	0.132	-0.349***	-0.290*
	(0.042)	(0.138)	(0.058)	(0.045)	(0.098)	(0.064)	(0.125)
Swimming	0.191***	-0.317*	-0.028	-0.075	0.078	-0.396***	-0.380**
	(0.045)	(0.147)	(0.062)	(0.048)	(0.107)	(0.068)	(0.136)
Walking	0.176***	-0.190	-0.093	-0.111*	-0.089	-0.349***	-0.566***
	(0.042)	(0.139)	(0.058)	(0.045)	(0.099)	(0.064)	(0.126)
Triathlon	0.209***	0.290	-0.069	-0.073	0.454***	-0.271***	0.157
	(0.047)	(0.151)	(0.063)	(0.049)	(0.111)	(0.067)	(0.140)
Other	0.222***	0.0800	-0.098	-0.121**	0.072	-0.346***	-0.325**
	(0.042)	(0.138)	(0.058)	(0.045)	(0.099)	(0.064)	(0.125)

Med charity	0.004	-0.208***	-0.038**	-0.025*	-0.150***	-0.064**	-0.223***
	(0.011)	(0.033)	(0.014)	(0.011)	(0.027)	(0.021)	(0.035)
Large charity	-0.009	-0.248***	-0.022	-0.014	-0.163***	-0.062**	-0.232***
	(0.011)	(0.031)	(0.013)	(0.010)	(0.026)	(0.019)	(0.032)
Major charity	0.025*	-0.305***	-0.017	-0.024*	-0.243***	-0.062**	-0.308***
	(0.011)	(0.031)	(0.013)	(0.010)	(0.026)	(0.019)	(0.032)
Size unknown	0.019	-0.0921**	-0.032*	-0.018	-0.105***	-0.031	-0.117***
	(0.010)	(0.030)	(0.012)	(0.010)	(0.025)	(0.019)	(0.031)
Overseas char	0.074***	0.109*	0.028	0.028	0.020	0.138***	0.212***
	(0.017)	(0.047)	(0.019)	(0.015)	(0.041)	(0.023)	(0.052)
Target amount			-0.000***	-0.000***			
			(0.000)	(0.000)			
Target (0/1)					0.398***	0.0571***	0.450***
					(0.0265)	(0.0148)	(0.0334)
Female						-0.250***	
						(0.004)	
Anonymous						-0.580***	
						(0.015)	
DK gender						0.010*	
						(0.004)	
_cons	0.710***	7.096***	0.145	0.372***	1.362***	3.288***	4.703***
	(0.107)	(0.291)	(0.123)	(0.0957)	(0.252)	(0.157)	(0.318)
N	31135	22185	22185	22185	31135	462304	31135

Standard errors, clustered at the page level, in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All regressions additionally include year and month dummies. For variable definitions, see Table 2.