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Consistent or Balanced? On the Dynamics of Voluntary Contributions

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Abstract

We investigate the effects of a charitable lottery and an income tax on repeated donations. The analysis is based on a modified two-round dictator game with the subject's charity of choice as recipient, and additional stimuli in the first round. We find increased immediate contributions in the presence of both a charitable lottery and an income tax. The treatment effects weakly spill over to the second round. This is particularly observable for a subgroup of participants with a rule-based mind-set, which confirms the importance of the subjects' ethical mind-sets in the context of dynamic pro-social behaviour.

Keywords: Experiment; Charitable Giving; Lottery; Tax; Modified Dictator Game; Moral Balancing

JEL Codes: C91, D03, D64, H41

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1. Introduction

Voluntary contributions to public goods tend to fall short of the socially optimal level. In response to that, different interventions have been suggested, ranging from institutional solutions to the provision of additional economic incentives, to increase voluntary contributions to public goods. While there is a large body of literature analysing the immediate effects of these interventions in the context of charitable giving, subsequent effects are often ignored. Individuals, however, face donation decisions repeatedly, both in similar and different contexts, and both by past and by new fundraisers. Yet, little is known whether and, if so, how economic interventions in donation decisions affect subsequent behaviour.

Social psychologists have been pioneering the analysis of subsequent decision making, suggesting that moral behaviour is not static but depends on past decisions (Merritt et al. 2010, Dolan and Galizzi 2015). This may be important in the context of private contributions to public goods as well. Immediate effects of interventions may be counterbalanced (e.g. Monin and Miller 2001, Sachdeva et al. 2009) or may persist (e.g. Cialdini et al. 1995, Burger and Caldwell 2003, Cornelissen et al. 2008) in subsequent donations. The economic literature provides only few and competing results. Landry et al. (2010) and Shang and Croson (2009) find positive long run effects of a charitable lottery and information campaign, respectively, on subsequent donations. In contrast, Meier's (2007) analysis of matching grants finds no positive effect on donations in the long run, but rather a negative effect in the first period after the matching scheme is removed. Although these field studies offer insights from a natural environment it remains unclear what drives the mixed results.

In this paper, we use the controlled environment of a laboratory experiment to analyse the immediate and subsequent effects of two prominent drivers of charitable giving: a charitable lottery and an income tax. We create a setting of repeated donations by using a modified two-round dictator game with the subject's charity of choice as recipient. In one treatment, we introduce a charitable lottery linking first round contributions to the chance of winning a fixed common value lottery prize. In a second treatment, we levy an income tax of 25% on the participants' first round endowment, which is automatically transferred to the charity of choice. In a control condition, we ask subjects to donate twice without any additional incentive. The second round is identical across treatments and does not contain any stimuli, allowing us to analyse subsequent effects.

We find increased total contributions in the presence of both a charitable lottery and an income tax. While the first finding is in line with previous experiments (e.g. Lange et al.

2007, Landry et al. 2006), the absence of crowding out stands in stark contrast to evidence from similar experiments (e.g. Eckel et al. 2005). As these previous experiments were mainly conducted in the U.S., we suspect differences in the subject pool to drive the competing results. In the second round, when both interventions are removed, we observe weakly higher donations compared to the control treatment. Thus, our data suggest some persistence of the first round effects, while we do not find evidence for backfiring of the interventions. Putting it differently, we cannot confirm moral balancing in the context of an income tax or a charitable lottery, and rather find evidence of the opposite effect, consistency seeking. In a refinement, we show that, in line with Cornelissen et al. (2013), the positive spillover effects hold in particular for subjects with a rule-based mind-set.

Our findings add new insights on both the immediate and the subsequent effects of two prominent economic interventions. Furthermore, we provide a first step towards the consideration of different moral frameworks in economic experiments.

2. Related Literature

We start out by summarizing the literature on the immediate effects of a charitable lottery and an income tax on donation behaviour. Laboratory experiments tend to find increased donations in the presence of charitable lotteries. Most of these studies, however, are based on a public goods game (Morgan and Sefton 2000, Lange et al. 2007, Orzen 2008, Corazzini et al. 2010), potentially involving strategic behaviour. In response to that critique, non-strategic dictator games have started to be employed to study charitable giving (e.g. Bolton and Katok 1998, Eckel et al. 2005), but not yet in the context of a charitable lottery. In a field experiment, Landry et al. (2006) report donations to increase when linking contributions to a charitable lottery in a door-to-door fundraising campaign. In contrast, Onderstal et al. (2013) do not find a significant effect of a charitable lottery in a field experiment in the Netherlands. According to the authors, their result may be due to the private value of the implemented charitable lottery or to cultural difference between the U.S. and Europe.

With respect to taxation, econometric and experimental studies support incomplete crowding out of voluntary contributions. Econometric studies (e.g. Steinberg 1991, Kingma 1989, Payne 1998, Ribar and Wilhelm 2002, Manzoor and Straub 2005, and Andreoni and Payne 2011) find incomplete crowding out mostly ranging between 0 and 50 percent of the imposed tax. Experimental studies (e.g. Andreoni 1993, Bolton and Katok 1998, Chan et al. 2002 and Eckel et al. 2005) tend to observe substantially higher levels of crowding out. Andreoni

(1993) shows in one of the first laboratory experiments on this topic some high but incomplete levels (71%) of crowding out in a public good game. Bolton and Katok (1998) introduce a tax into a standard dictator game and find similar levels of crowding out (74%). The study most related to our experiment is Eckel et al. (2005), who use a dictator game with the subject's charity of choice as a recipient. The authors impose a mandatory transfer on the subject's endowment and vary both the size of the transfer and its frame. When framing the mandatory transfers as an income tax on subjects' own endowments, the authors find almost complete crowding out.

With respect to dynamic effects of these interventions, we are aware of three experimental studies. In a door-to-door fundraising campaign, Landry et al. (2010) re-approach the participants of an earlier fundraising campaign (Landry et al. 2006) after one and one-half years and analyse whether the previous treatments still had behavioural effects. The authors find that people initially stimulated by a charitable lottery continue to give more in the subsequent campaign while those attracted by a non-economic incentive scheme (attractiveness of the donation collector) did not. Shang and Croson (2009) vary social information in a local radio station's on-air fund drive. Participants calling the station to make a pledge received different information on previous contributions of others. The results show that providing the potential donors with information on higher donations (drawn from the 90^{th} and 95^{th} percentile of the distribution of previous donation levels) induced increased contributions. Participants provided with information from the high percentiles continued to give more and more often one year later. In contrast, Meier (2007), who analyses conditional matching grants in the field, finds no positive treatment effects in the long run. He even reports a negative effect for donations in the first post-intervention observation, 6 months after the removal of the matching scheme. All these studies have in common that they observe behaviour in the field over a long period of time, ranging from 6 to 18 months.

More general evidence on dynamic moral behaviour mainly stems from the psychological literature.[1] Moral balancing theories claim that individuals fluctuate in moral behaviour to maintain a certain moral self-image on average (e.g. Merritt et al 2010, Jordan et al. 2011). More precisely, this approach predicts that past good deeds decrease the likelihood of subsequent good deeds (e.g. Sachdeva et al. 2009). There is evidence for moral balancing, in related (e.g. Monin and Miller 2001) as well as in unrelated domains (e.g. Khan and Dhar 2006, Mazar and Zhong 2010, Clot et al. 2011, Jordan et al. 2011). Mazar and Zhong (2010)

[1] For a detailed overview on moral balancing in empirical analyses, please see Merritt et al. (2010).

e.g. document asocial and unethical behaviour after purchasing green products. Ploner and Regner (2013) report that subjects who perform better in a real effort donation task are less generous in a subsequent dictator game. Based on various repeated dictator and prisoner's dilemma games, Brosig et al. (2007) find that other-regarding preferences wash out over time. On the other side, there is also evidence on the opposing tendency. Behavioural consistency describes a preference to stick to past actions which can be explained by a desire to avoid cognitive dissonance (Festinger 1957, Taylor 1975, Cialdini et al. 1995). The foot-in-the-door technique (Freedman and Fraser 1966) takes advantage of behavioural consistency and demonstrates that people are more inclined to help if they have been induced to help in the preceding situation. Furthermore, remembering previous sustainable behaviour (Cornelissen et al. 2008) or signing pro-social petitions (Burger and Caldwell 2003) has been reported to increase subsequent moral actions. In related studies from the economic literature, de Oliveira et al. (2011) report consistency seeking in repeated donations and identify the existence of a "giving type" that is defined by donating to different organisations. In their experiment, however, only one decision was paid at the end, which may not allow for a potential effect of moral balancing. Carlsson et al. (2012) confirm constant pro-social behaviour over a time period of several years in the context of donations and volunteer work.

To sum it up, there are competing results with respect to repeated pro-social behaviour and little evidence on the subsequent effects of specific economic interventions.

3. Experimental Design and Procedures

3.1 Experimental Design

We use a modified two-round dictator game, similar to the one employed by Eckel et al. (2005). The subjects are endowed with €8 and choose a charity as the recipient in each round. In the first round, we vary the incentives for giving by introducing a charitable lottery and an income tax, respectively.

In baseline, subjects are asked to decide on their donations in the absence of any additional incentives. They play two identical rounds in which they can donate up to €8 in each round. In the first round of the lottery treatment, contributions are linked to the chance of winning a fixed prize. For each €0.50 contributed to the charity, subjects get a raffle ticket. The probability of winning the prize positively depends on the ratio of the players' own

contributions to overall contributions in the first round of the lottery treatment.[2] We use this intervention to study the effect of economically motivated transfers on subsequent behaviour.

In the first round of the tax treatment, we use a similar design as in Eckel et al. (2005) and implement an income tax of 25% on the subject's first round endowment. It is common knowledge that the tax of €2 is automatically transferred to the subject's charity of choice, leaving €6 at their free disposal. Forced contributions are labelled as 'income tax', since this framing showed the highest crowding out effect in Eckel et al. (2005). We use this intervention to study the effect of forced transfers on subsequent behaviour.

In the second round, both the charitable lottery and the income tax are removed. Subjects are faced with an identical choice situation in all treatments, allowing us to study potential spillover effects of the interventions.

[about here: Table 1: Summary of Experimental Design]

3.2 Procedures

The experiment was conducted in October 2013 at the mLab of the University of Mannheim. Subjects were recruited via Orsee (Greiner 2004). In all treatments, subjects were seated in separate cubicles and instructed about the rules of the game by means of a manuscript (instructions are provided in the supporting material). The subjects were told that there are two rounds in which they could earn money. In each round, subjects received information on the donation procedure, an envelope with €8 as their endowment and a list of six charities.[3] In each round, the subjects were asked to tick their charity of choice and to note down the amount of their contributions anonymously. Then, subjects put both the decision sheet and the corresponding coins into an envelope, which they were also asked to seal. To avoid confusion in the second round, subjects were explicitly informed that there is no longer a charitable lottery or an income tax, respectively.

The envelopes were collected after each round and transferred to a notary after the experiment. Under supervision of the notary, the envelopes were opened, donations were

[2] Note that this design follows natural charitable lotteries, in which winning probabilities also depend on the (unknown) contributions of others.

[3] In the two rounds, subjects received two different lists of charities (provided in the supporting material). Both lists contained charities related to environmental issues, energy poverty, poverty and medical issues. The lists balanced the charities with the highest cumulative national donations to guarantee similar attractiveness of the lists. A pilot experiment confirmed the equality of attractiveness. Nevertheless, we randomized the two lists over subjects and did not identify a significant effect when controlling for the specific lists in the econometric analysis.

recorded and the money was transferred to the respective charity organisations via the notary's escrow account. This procedure was common knowledge. To further enhance credibility, participants received an email about the total amount of donations and could also access this information on the project homepage.[4]

The notary additionally created lottery tickets with the (anonymous) subject code for each €0.50 donated in the first round of the lottery treatment. Then, all tickets were put in a box and one ticket was drawn under the supervision of the notary. The winner code was emailed to all participants of the lottery treatment. The winner picked up the €100 in cash upon providing his personal code.[5]

In the first round of the tax treatment, subjects were told that they had to place two out of the received €8 in the envelope independent of their donation. The participants were informed that their imposed contribution of €2 will be transferred to their charity of choice, also via the notary's escrow account.

4. Hypotheses

We are interested in the subsequent effects of interventions. Before we derive the hypotheses for the second round, we formulate the expected immediate reactions.

4.1 Immediate Effects

In the lottery treatment, the subject's probability of winning the common value prize is positively influenced by her donation (e.g. Duncan 2002) and we hence expect subjects to donate more than in the first round of the baseline treatment (e.g. Morgan and Sefton 2000).

Hypothesis 1: In the presence of a charitable lottery, total contributions are higher than in baseline.

In the income tax treatment, we expect subjects to crowd out voluntary contributions as the income tax is transferred to the public good. While pure altruists will reduce voluntary contributions by the full amount of the tax (see e.g. Warr 1982, 1983, Roberts 1984, Bergstrom et al. 1986), subjects gaining 'warm glow' utility from giving (Andreoni 1989, 1990) will only show incomplete crowding out. The literature indicates that givers are

[4] Please see: www.zew.de/soko2013.
[5] Note that the prize is part of the design and was not paid by the charities themselves. Therefore, also no administrative costs occur.

typically motivated by both the level of the public good and warm glow (see e.g. Crumpler and Grossman 2008), predicting partial crowding out and thus increased total contributions.

Hypothesis 2: In the presence of an income tax, total contributions are higher than in baseline.

4.2 Subsequent Effects

Building on these hypotheses of immediate effects, we now turn to second round behaviour, which is in the focus of our analysis. We provide hypotheses for both potential effects: moral balancing (BAL) and behavioural consistency (CON).

We start with the baseline treatment in which subjects face the same choice situation twice. Moral balancing theories claim that past good deeds induce self-licensing effects which decrease the likelihood of additional good deeds in the future (Merritt et al. 2010). Based on this approach, we would expect subjects to be less generous if they are asked to donate for a second time, yielding the following hypothesis.

Hypothesis 3a (BAL): In the absence of economic interventions, second round contributions are lower than in the first round.

Preferences for consistency, on the other hand, would result in a tendency to stick to the first choice as closely as possible, giving rise to the following hypothesis.[6]

Hypothesis 3b (CON): In the absence of economic interventions, second round contributions are equally high as in the first round.

Next, we derive hypotheses for the two treatment conditions. Following the argument of moral balancing, a deviation from a "normal state of being" is balanced with a subsequent action that compensates the prior behaviour (Brañas-Garza et al. 2013). In particular, relatively more past good deeds are expected to have a relatively stronger licensing effect (Merritt et al. 2010). Symmetrically, past bad actions trigger negative feelings and make people more likely to engage in future moral behaviour to offset those (Sachdeva et al. 2009). Note that moral balancing theories are not explicit in how individuals might counter-balance mandatory contributions imposed by a tax. We will consider total contributions, including the tax transfers, by arguing with two insights: First, Eckel et al. (2005) report that a certain

[6] Note that in this case we cannot distinguish between standard economic theory and preferences for consistency as they would both imply identical behaviour in both rounds.

fraction of subjects explicitly claim that the tax transfers are actually their own contributions, independent of the level of crowding out. Second, think of a situation in which subjects are forced to contribute 100% of their endowments, leading to zero voluntary contributions. Under such conditions it seems more intuitive that subjects identify the forced contributions as their own and feel licensed to give less in a subsequent round, as opposed to subjects feeling a need to morally clean this transfer. This should be particularly true in our design in which subjects place the tax money in the envelopes themselves. Based on this assumption and the above mentioned theory of moral balancing, externally induced changes in total donations, as expected in Hypotheses 1 and 2, should be counter-balanced subsequently, in comparison to baseline.

Hypothesis 4a (BAL): Higher (lower) total contributions in round one should be succeeded by lower (higher) total contributions in round two, compared to baseline.

Alternatively, preferences for consistency (Festinger 1957, Taylor 1975, Cialdini et al. 1995) imply that subjects dislike changes in behaviour across rounds. Hence, induced deviations in round one should also affect subsequent behaviour. Put it differently, treatment effects in round one should shift individuals' reference points and thereby also persist in subsequent decisions. We formulate the following alternative hypotheses based on preferences for consistency.

Hypothesis 4b (CON): Higher (lower) total contributions in round one should be succeeded by higher (lower) total contributions in round two, compared to baseline.

There is an ongoing debate which of the two theories prevails (Effron and Monin 2010, Merritt et al. 2010, Susewind and Hoelzl 2014, Dolan and Galizzi 2015). A potential individual driver is the ethical mind-set. Here, the psychological theory of morality distinguishes deontologists and consequentialists (e.g. Singer 1991). Deontologists are guided by moral norms and rules while consequentialists focus on the outcome of their decisions and justify their moral behaviour by the consequences (e.g. Tanner et al. 2008). Cornelissen et al. (2013) provide experimental evidence suggesting that consistency seeking is more prominent for people with a deontological (goal-based) mind-set while a consequentialist (outcome-based) ethical mind-set favours moral balancing. This gives rise to our last hypothesis.

Hypothesis 5: Subjects with a deontological mind-set are more likely to seek behavioural consistency, while subjects with a consequentialist mind-set are more likely to behave according to moral balancing theory.

5. Results

In the experiment, 148 students from different academic disciplines participated in nine sessions. Total contributions, i.e. contributions including income tax, add up to €602.50 representing approximately 25.44% of the endowment. The detailed results of the immediate and the subsequent effects are discussed in the following sections.

[about here: Table 2: Summary Statistics]

5.1 Immediate Effects

First, we report the immediate impact of the economic interventions on contributions in the first round. Average total contributions are €1.40 in the baseline treatment, €2.78 in the lottery treatment and €3.34 in the tax treatment.

In pairwise comparisons of first round behaviour, we test for treatment effects. In the lottery treatment, significantly more money is raised than in baseline (p=0.002, Mann-Whitney U test).[7] Moreover, also both the number of donors (p=0.078, Mann-Whitney U test) and the average contributions of donors (p=0.012, Mann-Whitney U test) are higher than in baseline.[8] This supports Hypothesis 1.

Result 1: The presence of a charitable lottery immediately increases total contributions.

Next, we test whether the presence of an income tax immediately affects contributions. In our data, voluntary contributions, i.e. donations excluding the income tax, are not different from baseline (p=0.678, Mann-Whitney U test) showing no evidence of crowding out in the aggregate. This result is confirmed by a test of equal distribution that cannot be rejected (p=0.481, KS exact test). The only crowding effect we can find is a slightly smaller share of donors, i.e. subjects with voluntary contributions on top of the tax, compared to baseline (p=0.087, Mann-Whitney U test), however, without a significant reduction of voluntary transfers at the aggregate level. In consequence, total contributions roughly rise by the level of the tax and are significantly higher than in the baseline setting without an income tax (p=0.000, Mann-Whitney U test), thus confirming Hypothesis 2.

Result 2: The presence of an income tax immediately increases total contributions compared to baseline.

[7] If not mentioned differently, we use the two-sided Mann-Whitney U test.
[8] A Kolmogorov-Smirnov test (KS-test) on equality of distributions shows that the voluntary contributions in baseline are significantly smaller than in the lottery treatment (exact p=0.005).

Note that the documented absence of crowding out stands in stark contrast to the literature and deserves discussion. We base our experimental design on Eckel et al. (2005) who find almost full crowding out in their tax-framed treatment. In our experiment, the presence of the income tax hardly affects voluntary contributions at all. Could the competing results be driven by minor differences in the experimental design? First, in Eckel et al. (2005), subjects got their money after the donation decision and donations were transferred via checks dropped in a mailbox by an observer. In our design, subjects receive the endowment of €8 in cash in each round and financial transfers are made through a local notary's office. We chose this form as it is a more natural way to proceed in Germany. We test the credibility of our payment procedure using the control question employed by Eckel et al. (2005) and find similar levels of trust as in the original study. Hence, we do not think that the payment procedure drives our results. Second, contrary to the one-round procedure in Eckel et al. (2005), we employ a two round design. The second round is announced in advance and its content is disclosed in the second round. Although this is a larger disparity from the original setup, we do not see how the announcement of the second round could reduce the level of crowding out in the first round. As we provide one of the first lab experiments outside the U.S. on this question, we suspect differences in the subject pool to drive the results. Already Weimann (1994) find substantial differences in cooperation behaviour in a public good game between American and German students: Americans free-ride more than Germans. Underlying drivers may be different levels of warm glow (Andreoni 1989 and 1990, Crumpler and Grossman 2008).

As a robustness check, we run a regression analysis on voluntary contributions only. We apply a two-step estimation approach: First, we estimate a Probit model including the whole sample to analyse the decision to voluntarily contribute or not. Second, we estimate an OLS model only including the voluntarily contributing subjects to analyse the amount of voluntary contributions.[9] In both estimation steps we include the same explanatory variables, which are the treatment dummies and socio-demographic data (gender, age, religion, and nationality).[10] The estimations support our previous results (see Table 3). Again, estimates show that the

[9] We also run a hurdle model (see e.g. Nikiforakis 2008), as the first round contributions are count data (results are provided upon request). Firstly, we estimate a Probit model including the whole sample to analyse the decision to voluntarily contribute or not. Secondly, we estimate a Poisson hurdle model only including the voluntarily contributing subjects to analyse the amount of voluntary contribution. In both estimation steps we include the same explanatory variables, which are the treatments and socio-demographic data (gender, ln-age, religion, and nationality). The results do not change in direction and significance level, when applying the hurdle model.

[10] We decided only on these invariable regressors because other explanatory variables might be object to endogeneity problems. Binary regressors are estimated with the finite-difference method.

lottery treatment attracts significantly more donors (model 1 p=0.053, model 2 p=0.017) and also induces higher contributions per donor compared to baseline (model 1 p=0.003, model 2 p=0.012). For the tax treatment we do not find significant effects on the decision to provide own contributions (model 1 p=0.103, model 2 p=0.196), nor with respect to the level of voluntary contributions per donor (model 1 p=0.118, model 2 p=0.407), leading to higher total contributions, including the tax, than in baseline.

[about here: Table 3: Regression on Voluntary Contributions Round 1]

5.2 Subsequent Effects

In order to analyse the subsequent effects, we compare second round donations in the lottery and the tax treatment to baseline. Average donations in the second round are €1.26 in the baseline treatment, €1.78 in the lottery treatment and €1.73 in the tax treatment (see Figure 1).

[about here: Figure 1: Average Donations in Round 1 and Round 2]

In baseline, donations in the second round are lower than in the first round (see Figure 1). On average, contributions decrease from €1.40 in the first round of the experiment to €1.26 in the second round, but not significantly (p=0.396, Wilcoxon signed-rank test). Hence, in the aggregate we cannot reject consistent behaviour (Hypothesis 3b) and do not find significant evidence in favour of moral balancing (Hypothesis 3a).

Result 3: In absence of economic interventions, donations do not change significantly across rounds.

In the lottery treatment, first round contributions are higher than in baseline. In round two, contributions are again higher, but we cannot reject equal donation levels (p=0.857, Mann-Whitney U test, p=0.193, two-sided t-test). Testing the directional predictions, we find no evidence for Hypothesis 4a, which claims donations to be smaller than in baseline due to moral balancing (p=0.571, one-sided Mann-Whitney U test; p=0.904, one-sided t-test), and find only weak support for Hypothesis 4b, claiming higher contributions than in baseline due to preferences for consistency (p=0.429, one-sided Mann-Whitney U test; p=0.096, one-sided t-test). The share of donors in the second round is not significantly different from baseline (p=0.105, Mann-Whitney U test). When restricting the sample to donors, defined as subjects contributing positive amounts in the second round, we find significantly higher contributions than in baseline (p=0.003, one-sided Mann-Whitney U test) suggesting a positive spillover

effect of the lottery treatment on second round behaviour of donors. This provides weak support to Hypothesis 4b and thus to the presence of consistency seeking.

Result 4.1: The presence of a charitable lottery in the first round weakly increases contributions in the second round, compared to baseline.

In the first round of the tax treatment, total contributions are higher than in baseline. Also second round contributions exceed those in the control condition, but differences are only weakly significant (p=0.131, Mann-Whitney U test; p=0.166, t-test). Based on directional tests, we find no support for Hypothesis 4a, which claims smaller contributions than in baseline (p=0.935, one-sided Mann-Whitney U test; p=0.917, one-sided t-test), but report significantly higher transfers as predicted by behavioural consistency in Hypothesis 4b (p=0.065, one-sided Mann-Whitney U test p=0.083, one-sided t-test). The share of donors in the second round does not significantly differ from baseline (p=0.585, Mann-Whitney U test). When restricting the sample to donors, we find again significantly higher contributions than in baseline (p=0.049, one-sided Mann-Whitney U test), which in turn provides additional support for Hypothesis 4b. Also based on a within subject test, voluntary contributions (excluding income tax) increase significantly from €1.34 in the first to €1.73 in the second round (p=0.005, Wilcoxon signed-rank test).

Result 4.2: The presence of an income tax in the first round weakly increases contributions in the second round, compared to baseline.

As in the first round analysis, we also apply a two-step model to analyse contributions as a robustness check.[11] The results support our previous analyses (see Table 4). In the lottery as well as in the tax treatment, the propensity to donate is not significantly different from baseline (lottery model 1 p=0.113, model 2 p=0.104, tax model 1 p=0.579, model 2 p=0.556). The amount of donations in the lottery treatment, is higher than in baseline (model 1 p=0.003, model 2 p=0.006), which is in line with the previous bilateral tests restricted to donors. The results for the tax treatment support previous analyses, but at smaller levels of significance (model 1 p=0.119, model 2 p=0.166).

[about here: Table 5: Regression on Voluntary Contributions Round 2]

[11] Like for the immediate effects in round one, we also run the tests with a hurdle model for the subsequent effects. The results are similar and available upon request.

While we have focused on total contribution levels so far, the spillover effect might also work through contributions that represent a constant share of the endowment. Regarding the disposable endowment, which equals €6 in the first round of the tax treatment and €8 for all other treatments and rounds, subjects in the lottery and tax treatment continue to give a higher share in the second round compared to baseline.

[about here: Figure 2: Average Donations as Shares of Disposable Endowment in Round 1 and Round 2]

In a next step, we analyse individual behaviour to provide additional insights on the subsequent effects. In Figure 3, we plot individuals' donations in the second round against their corresponding contributions in the first round. In baseline, approximately half of the individuals donate exactly the same amount in both rounds, but also in the other two treatments, we can observe stable behaviour.

[about here: Figure 3: Individual Donations in Round 1 and Round 2]

Table 4 reports shares of individuals with consistent behaviour over rounds. Here, we apply a strict criterion, requiring contributions to be of exactly the same amount in both rounds. We observe substantial fractions of subjects with stable contributions in the treatments, contradicting the idea of moral balancing. Moreover, there is not only consistent selfish behaviour, i.e. zero contributions in both rounds of the game, but also consistent pro-social behaviour.

[about here: Table 4: Percentage of Individuals with Consistent Contributions]

5.3 The Influence of the Ethical Mind-Set

As a further refinement, we control for the individual ethical mind-set which is likely to determine whether the subject behaves in line with consistency seeking or moral balancing theory (Cornelissen et al. 2013). In a post-questionnaire, we asked subjects to rate a list of statements related to a deontological mind-set.[12] After making their decisions, participants were asked to indicate their accordance with the different statements on a five-point scale ranging from 'strongly disagree' to 'strongly agree'. We create a dummy variable

[12] For the deontological rule-based mind-set we use the following statements: "Everybody should give a part of his/her income", "One has to help people in need", "Everybody should be socially engaged", and "We shall help strangers in the same way we help our relatives".

(*deontologist*) in the spirit of Mayo and Marks (1990)[13] which is set to one for subjects whose average accordance to the four deontology items is above the sample mean.[14] We will refer to this group as deontologists, while the remaining subjects are classified as consequentialists. Table 6 provides summary statistics on the treatment effects conditional on the ethical mind-set of the subject.

[about here: Table 6: Summary Statistics Distinguishing the Moral Framework]

In baseline, first round donations of deontologists and consequentialists are similar on average (p=0.738, Mann-Whitney U test). In the second round, consequentialists weakly differ from deontologists (p=0.138, Mann-Whitney U test). Based on within subject comparisons, we find evidence in favour of moral balancing. Subjects classified as deontologists give similar amounts in both rounds (p=0.365, Mann-Whitney U test), while consequentialists significantly reduce donations in the second round (p=0.066, Mann-Whitney U test). These results confirm previous evidence suggesting that subjects with a deontological mind-set are less likely to behave in line with the theory of moral balancing (e.g. Cornelissen et al. 2013), therefore confirming Hypothesis 5.

Result 5.1: In the absence of economic interventions, subjects with a deontological mind-set donate equal amounts in two subsequent rounds, while those with a consequentialist mind-set reduce contributions in the second round.

In the lottery treatment, subjects classified as deontologists give significantly more in the first round compared to baseline (p=0.005, Mann-Whitney U test).[15] In round two, they continue to give higher amounts than in baseline (p=0.191, Mann-Whitney U test; p=0.094, t-test). Testing the directional hypotheses, we do not find evidence for moral balancing (p=0.901, one-sided Mann-Whitney U test; p=0.953, one-sided t-test), while the behaviour of deontologists is in line with consistency seeking as we find contributions to exceed those in the baseline treatment (p=0.099, one-sided Mann-Whitney U test; p=0.047, one-sided t-test). The share of donors in the second round is unaffected by the lottery (p=0.733, Mann-Whitney

[13] Alternatively, we create a dummy variable equal to one if a subject fully agreed to at least one of the deontologist statements and did not fully agree to at least one of the consequentialist statements. The results were qualitatively similar.

[14] Cronbach's alpha is 0.6. The small number of items may explain the relatively low value of alpha (see Swailes and McIntyre-Bhatty 2002 for a discussion).

[15] As we cannot observe the same subject under both conditions, we compare consequentialists and deontologists across treatments. The ethical mind-set is not affected by treatment assignment (p>0.2), hence the exogeneity assumption holds.

U test), but donors give significantly more compared to baseline (p=0.003, one-sided Mann-Whitney U test), consequently confirming the existence of spillover effects.

First round contributions of subjects classified as consequentialists are higher than in baseline, but not significantly (p=0.179, Mann-Whitney U test). In round two, they give less than in baseline, but again not at a conventional level of significance (p=0.130, Mann-Whitney U test; p=0.534, t-test). The share of donors with an outcome-based ethical mind-set is smaller than in baseline (p=0.069, Mann-Whitney U test), but donors do not contribute significantly different amounts than in the baseline treatment (p=0.623, Mann-Whitney U test). Based on the directional hypotheses, we do not find higher contributions than in baseline (p=0.733, one-sided t-test) and only weakly lower donations (p=0.065, one-sided Mann-Whitney U test; p=0.267, one-sided t-test), suggesting a weak tendency to balance previous donations, but not as strong as in baseline.

Result 5.2: Following a charitable lottery, subjects with a deontological mind-set continue to give more than in baseline, while those with a consequentialist mind-set slightly reduce their contributions.

In the tax treatment, voluntary first round contributions of deontologists are not significantly different from those in baseline (p=0.271, Mann-Whitney U test), while total contributions to charities, i.e. including the income tax, are higher (p=0.000, Mann-Whitney U test). In round two of the tax treatment, deontologists give weakly more than in baseline (p=0.140, Mann-Whitney U test; p=0.140, t-test). Directional tests confirm higher contributions (p=0.070, one-sided Mann-Whitney U test; p=0.070, one-sided t-test) compared to baseline, while there is no evidence for decreased donations compared to baseline as predicted by moral balancing (p=0.930, one-sided Mann-Whitney U test; p=0.930, one-sided t-test). The share of donors with a deontological mind-set is similar to baseline (p=0.418, Mann-Whitney U test). Looking only at donors in the second round of the tax treatment, deontologists give significantly more compared to baseline (p=0.067, Mann-Whitney U test), again suggesting a tendency to seek behavioural consistency.

Subjects classified as consequentialists reduce voluntary contributions in line with the crowding out hypothesis (p=0.088, Mann-Whitney U test). Nevertheless, crowding out is incomplete so that total contributions to charities, including the income tax, are higher than in baseline (p=0.000, Mann-Whitney U test). In round two of the tax treatment, consequentialists contribute similar amounts as in baseline (p=0.562, Mann-Whitney U test, p=0.870, t-test).

Directional tests do neither find higher (p=0.719, one-sided Mann-Whitney test; p=0.565, one-sided t-test) nor lower (p=0.281, one-sided Mann-Whitney test; p=0.435, one-sided t-test) contributions than in baseline. The share of donors is smaller than in baseline for consequentialists (p=0.061, Mann-Whitney U test), but donors' contributions are not significantly different from those in the baseline treatment (p=0.760, Mann-Whitney U test). Despite higher total transfers in round one, second round behaviour of consequentialists is equal to baseline in round two, therefore showing no evidence of moral balancing.

Result 5.3: Following an income tax, subjects with a deontological mind-set continue to give more than in baseline, while those with a consequentialist mind-set are unaffected in round 2, compared to baseline.

Summarizing the findings, we can confirm recent evidence that the ethical mind-set determines the dynamics of moral decisions. In the absence of interventions, subjects with a rule-based mind-set behave consistently while outcome-based subjects engage in moral balancing. Interestingly, there are no behavioural differences in the first round of the baseline treatment, confirming that there is no general level effect. Our results also show to what extent this tendency persists in the presence of economic interventions. In the lottery treatment, goal-based subjects adjust donations in the direction of behavioural consistency. Outcome-based subjects show small tendencies towards moral balancing, but these are less significant than in baseline. Hence, we do not expect significant backfiring after a lottery, in particularly not for individuals with a goal-based mind-set. Goal-based subjects are also more strongly stimulated by the lottery in the first place, while consequentialists' contributions are not different from baseline. This might lead to an overrepresentation of goal-based subjects in warm lists of fundraising campaigns using charitable lotteries, and might thus serve as an explanation of the results of Landry et al. (2006, 2010).

Put it differently, our findings hint towards a more general effect of the ethical mind-set. Deontologists show stronger immediate reactions to the external stimulus, suggesting that their intrinsically motivated donations remain unaffected, and the additionally stimulated transfers are added on top. Consequentialists, on the other hand, seem to immediately adjust intrinsically motivated contributions as their donation levels are hardly affected by the external stimulus. This is confirmed by evidence from the tax treatment, in which intrinsically and extrinsically motivated contributions are separated by construction. Here, only consequentialists crowd out voluntary contributions while deontologists' voluntary contributions are unaffected.

6. Conclusion

In this paper we study the immediate and subsequent effects of two prominent incentive schemes in the context of charitable giving. In the presence of a charitable lottery, we find immediate increases in donations. This result is in line with previous findings from the field and provides first evidence from the lab for the effectiveness of charitable lotteries in a non-strategic context. We also observe increased donation levels in the presence of an income tax. In fact, total donations rise by the size of the tax, showing no crowding out in the aggregate and thus contrasting previous findings, in particular those in Eckel et al. (2005). As we provide one of the first lab experiments outside the U.S. on this question, we suspect differences in the subject pools to drive our results.

In a next step, we analyse the treatment effects on subsequent donation decisions. We find that higher contributions in the first round are not counterbalanced subsequently. In contrast, treatment effects rather persist in the second round, supporting consistency seeking. A refinement, controlling for the ethical mind-set of the subjects, confirms our main results and shows that in particular goal-based subjects tend to seek consistency in behaviour, in line with related evidence from Cornelissen et al. (2013).

In summary, our results suggest that the economic interventions observed in the present study do not suffer from subsequent balancing. Based on our results, both a charitable lottery and mandatory transfers in form of an income tax may even stimulate voluntary contributions in the long run. This insight is important for assessing the long-term treatment effect of short term economic interventions. Our findings suggest that fundraisers and policy makers should not expect subsequent backfiring from charitable lotteries and income taxes. If anything, these interventions even have positive spillovers. Our insights may complement recent evidence from Susewind and Hoelzl (2014) who show that moral commitment increases consistency while moral progress encourages balancing. In the light of their results, economic interventions do not seem to stress moral progress.

There are several possible extensions to the presented research. As we show the relevance of the ethical mind-set in voluntary contributions, it seems to be important to extend this line of research in the economic literature. Moreover, it would be interesting to see if our findings persist when using different types or levels of economic interventions or when extending the analysis to a longer time frame. Finally, international studies on the existence of crowding out seem to be a fruitful endeavour to shed more light on potential cultural differences.

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8. Appendix

Table 1: Summary of the Experimental Design

Treatment	No. of subjects	Endowment 1st round	Endowment 2nd round	Intervention 1st round
Baseline	51	8	8	No
Lottery	49	8	8	Lottery ticket for each €0.50 donated Lottery prize €100
Tax	48	8	8	€2 income tax

Table 2: Summary Statistics

Treatment	Average donation 1st round	Share of donors 1st round	Average donations of donors 1st round	Average donation 2nd round	Share of donors 2nd round	Average donations of donors 2st round	Sum of average donations 1st and 2nd round
Baseline	€1.40	76%	€1.83	€1.26	75%	€1.70	€2.66
Lottery	€2.78	90%*	€3.10**	€1.78	59%	€3.00	€4.56
Tax	€3.34 (€1.34)	100% (60%)	€3.34 (€2.22)	€1.73	79%	€2.18	€5.07 (€3.07)

Note: Results excluding the income tax are reported in parenthesis.

Table 3: Regression on Voluntary Contributions Round 1

Dependent variable	Donation decision (yes/no)		Donation level (ln_donation)	
	(Model 1)	(Model 2)	(Model 1)	(Model 2)
Lottery treatment	0.1509*	0.1784**	0.4954***	0.4123**
	(0.0781)	(0.0749)	(0.1651)	(0.1610)
Tax Treatment	-0.1425	-0.1088	0.2898	0.1498
	(0.0873)	(0.0841)	(0.1840)	(0.1798)
Male		-0.1502**		-0.2398*
		(0.0680)		(0.1379)
ln_Age		-0.0309		0.6740*
		(0.1470)		(0.3420)
German		0.0867		0.7319***
		(0.1105)		(0.2094)
Religious		0.1373**		-0.3329**
		(0.0670)		(0.1372)
Constant			0.3317***	-2.0215*
			(0.1202)	(1.0700)
N	148	148	112	112

*Note: Donations decision is based on only voluntary donations, excluding tax in the tax treatment. Donation decision is estimated using a Probit specification, entries are average marginal effects. Donation level is estimated only for donors using OLS with the log of donations in round 1 as the dependent variable. Standard errors in parenthesis. *p<0.1; **p<0.05; ***p<0.01*

Table 4: Percentage of Individuals with Consistent Contributors

	Consistent donation Round 1 = donation Round 2		Inconsistent donation Round 1 ≠ donation Round 2	
	donation = 0	donation>0	Decreasing	Increasing
Baseline	20%	39%	24%	18%
Lottery	10%	33%	53%	4%
Tax	-	10%	90%	0%
	(17%)	(23%)	(15%)	(46%)

Note. Results excluding tax are reported in parenthesis.
Percentages may not total to 100 due to rounding.

Table 5: Regression on Contributions Round 2

Dependent variable	Donation decision (yes/no)		Donation level (ln_donation)	
	(Model 1)	(Model 2)	(Model 1)	(Model 2)
Lottery treatment	-0.1495	-0.1544	0.5594***	0.5257***
	(0.0944)	(0.0950)	(0.1816)	(0.1878)
Tax Treatment	0.0504	0.0529	0.2654	0.2413
	(0.0908)	(0.0897)	(0.1690)	(0.1731)
Male		-0.1452*		-0.0273
		(0.0745)		(0.1476)
ln_Age		0.2208		0.3924
		(0.1826)		(0.3510)
German		0.1246		0.5496**
		(0.1175)		(0.2226)
Religious		0.0354		0.0311
		(0.0737)		(0.1443)
Constant			0.2523**	-1.4272
			(0.1195)	(1.0905)
N	148	148	105	105

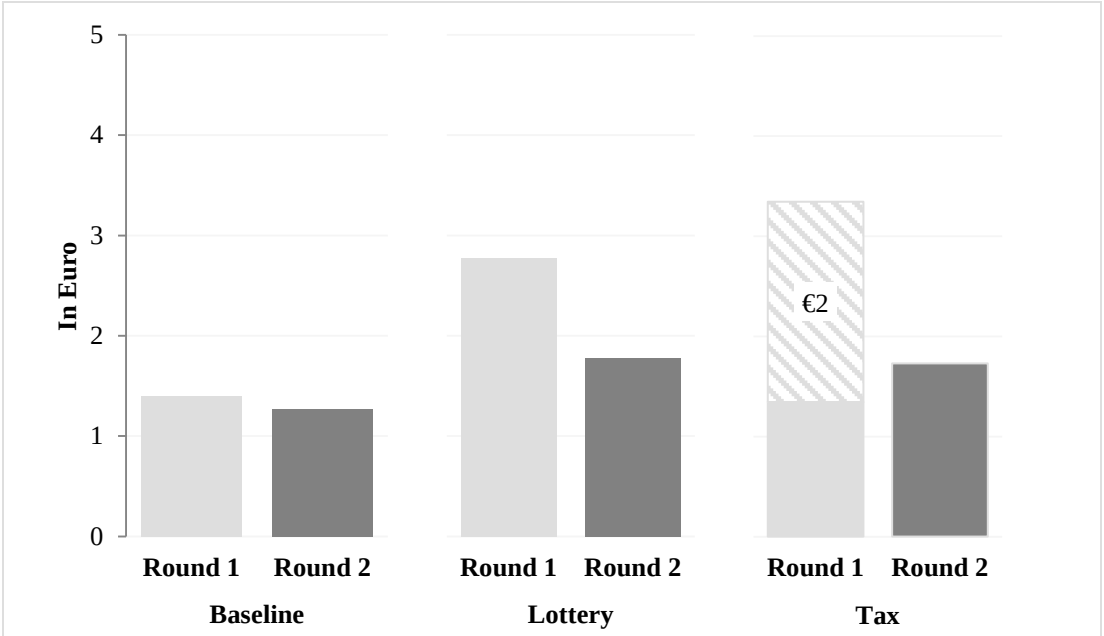
*Note: Donation decision is estimated using a Probit specification, entries are average marginal effects. Donation level is estimated only for donors using OLS with the log of donations in round 2 as the dependent variable. Standard errors in parenthesis. *p<0.1; **p<0.05; ***p<0.01*

Table 6: Summary Statistics Distinguishing the Ehtical Mind-Set

Treatment	Ethical mind-set	Average donation 1st round	Share of donors 1st round	Average donations of donors 1st round	Average donation 2nd round	Share of donors 2nd round	Average donations of donors 2nd round	Sum of average donations 1st and 2nd round
Baseline	D (N=20)	€1.40	85%	€1.65	€1.53	90%	€1.69	€2.93
	C (N=31)	€1.40	71%	€1.98	€1.10	65%	€1.70	€2.50
Lottery	D (N=26)	€3.38	88%	€3.83*	€2.62	77%	€3.40	€6.00
	C (N=23)	€2.09	91%*	€2.29	€0.83	39%	€2.11	€2.92
Tax	D (N=24)	€3.94 (€1.94)	100% (75%)	€3.94 €2.58	€2.42	88%	€2.76	€6.36 (€4.36)
	C (N=24)	€2.75 (€0.75)	100% (46%)	€2.75 €1.64	€1.04	71%	€1.47	€3.79 (€1.79)

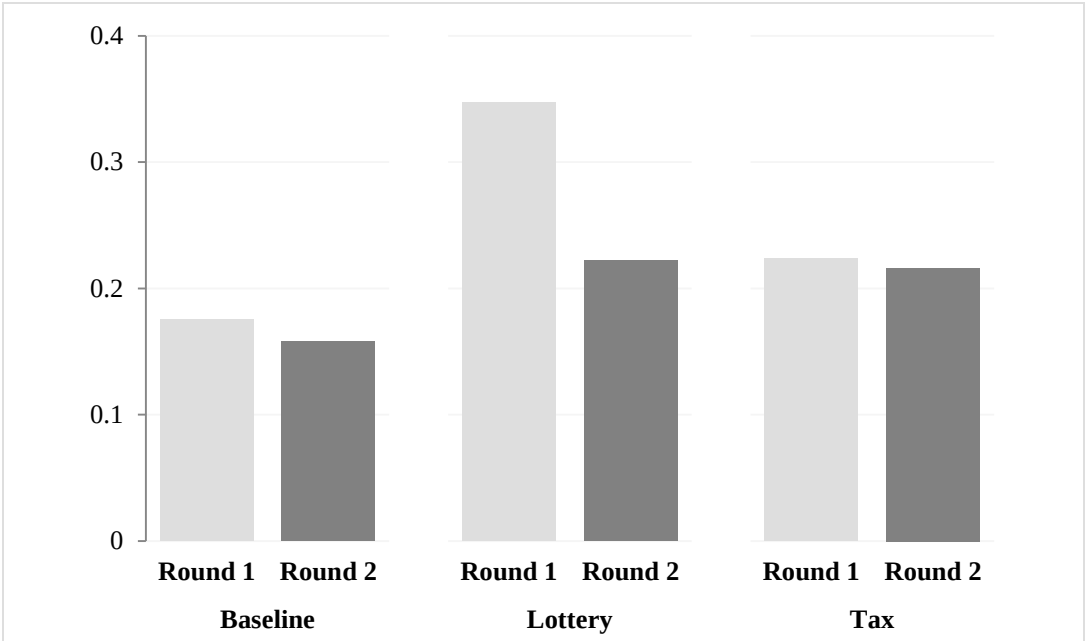
Note: D=Deontologist, C=Consequentialist. Results excluding the income tax are reported in parenthesis.

Figure 1: Average Donations in Round 1 and Round 2



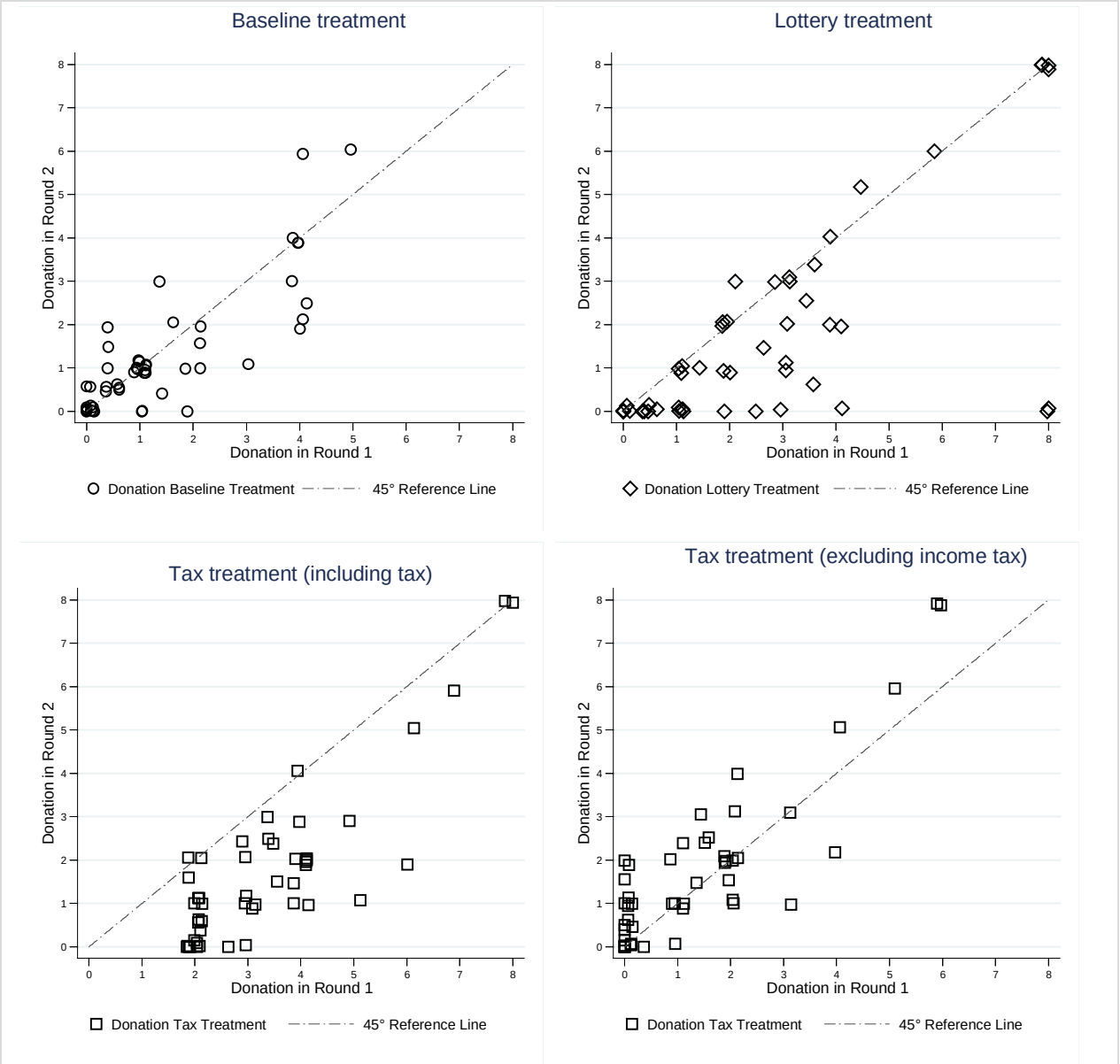
Note: Reported are the average donations per treatment and round. Donations in the 1st round of the tax treatment include the income tax of €2 which is marked in the shaded area.

Figure 2: Average Donations as Shares of Disposable Endowment in Round 1 and Round 2



Note: Shares of endowment are calculated on base of disposable endowment, which means €6 in the 1st round of the tax treatment and €8 for all other treatments and rounds.

Figure 3: Individual Donations in Round 1 and Round 2



Note: To avoid overplotting in scatterplots the individual donations were jittered up or down by a random number. Individual contributions serve as observations. Observations on the 45° reference line mark identical contributions in both rounds of the game. For the tax treatment donations including and excluding the income tax of €2 in the 1st round are reported in two separate graphs.