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A JAPAN'S EXPERIMENTAL COMPARISON OF REBATE AND MATCHING IN CHARITABLE GIVING

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A Japan's Experimental Comparison of Rebate and Matching in Charitable Giving

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Abstract

This study uses a Japanese nationwide sample and experimentally compares rebate and matching, both of which are schemes intended to lower the price of monetary donation. Standard economic theory predicts that the two schemes will have the same effect on individuals' donation behavior when their donation price is equivalent. However, we conduct an incentivized economic experiment through the Internet on 2,300 Japanese residents, and find that matching, which lowers the donation price by adding a contribution from a third-party, increases individuals' donation expenditures compared to rebate, which lowers it through a refund from a third-party. Specifically, the experimental result shows that the donation expenditure in a 50% rebate treatment drops by approximately ¥126 compared to the control, while in a 1:1 matching treatment with essentially the same price of donation as the 50% rebate, the expenditure conversely rises by approximately ¥56. This tendency is consistent with the results of previous experimental studies comparing the two schemes. We further empirically confirm that the superiority of 1:1 matching over 50% rebate is not conclusively influenced by the participants' confusion or misunderstanding, or budget constraint lines' difference between the two schemes. Although the Japanese government have previously enriched rebate's content, the level of monetary donations by the Japanese people is still low on an international scale. Based on this study's findings, we discuss the possibility that implementing matching into the society effectively encourages their donation behavior.

JEL Classification code: D91, H20, C91

Keywords: Charitable subsidy, Tax incentive, Framing effect, Online experiment

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1. Introduction

Non-profit organizations (NPOs) are essential for social stability since they provide complementary services in fields where public services are not sufficiently provided by governments (Salamon 1994). The NPOs depend on donations from individuals and corporations to continue their operations. Thus, the question of how to effectively collect those donations is an important social issue, and it has been explored both practically and academically (Sargeant and Shang 2017).

A number of countries have adopted rebate as s major scheme with the aim of encouraging monetary donations from individuals (Giving Japan White Paper Research Society 2017). Under this scheme, individuals' income tax is deducted by a certain amount when they report the monetary donations they made in that year when declaring their income for the year. Policymakers expect the scheme to have a positive effect on individuals' donation behavior, because it lowers the price of donation. For example, assume one donates ¥10,000 to a charity and receives a ¥5,000 tax reduction; this implies that one can donate ¥10,000 to the charity by spending only ¥5,000, and the price of ¥1 donation is ¥0.5.

However, rebate may not induce as much donation behavior as policymakers expect. Institutional and procedural hurdles can impede donors' use of the scheme. For example, the U.S. tax system allows taxpayers to select either a standard deduction or an itemized deduction, the latter of which is an actual deduction. Only if they select the latter, they can have access to the rebate scheme. In practice, high-income taxpayers usually choose the itemized deduction, while about 70% of taxpayers choose the standard one. Thus, many U.S. donors do not enjoy the benefits of the rebate scheme (Kato 2010).

Matching is another major scheme used to lower the price of donation, similar to rebate. Previous experimental economic studies have suggested that matching encourages individuals' donation behavior more effectively than rebate. When one donates ¥5,000 to a charity under a 1:1 matching treatment, a third-party, for example a corporation or foundation, matches the amount of this donation, and consequently ¥10,000 is donated to the charity. In other words, one needs to spend only ¥5,000 in order to donate ¥10,000 to the charity, and the price of ¥1 donation is ¥0.5 in a 1:1 matching. This is the same as when one donates ¥10,000 under the rebate scheme and receives a refund of ¥5,000 in the form of an income tax reduction. However, even when controlling for the donation price and other factors, laboratory experiments have found that the matching framing increases donation rates and average donation expenditure more than the rebate framing (Eckel and Grossman 2003, 2006). This tendency has been confirmed in field experiments (Bekkers 2015; Eckel and Grossman 2008, 2009, 2017). Based on this evidence, the matching scheme is now being employed in fundraising activities by NPOs around the world.

This study is the first to experimentally compare the rebate and matching schemes in Japan, and to test whether matching is more effective in driving individuals' donations in the country.

The investigation is being conducted in Japan even though there is evidence from other countries, because there are background and environmental factors at play that suggest that the rebate scheme might not be effective in promoting donation behavior in Japan either. In other words, there is a need to explore another measure that can more effectively encourage Japanese people's donation behavior.

First, although the Japanese government has made efforts to improve the rebate scheme, its utilization rate remains low, and the level of individual donations in Japan is also low on an international scale. The Japanese government introduced rebate as a tax incentive in 1962, with this scheme in force since over than half a century. The 2011 tax reforms enabled individual donors to select "exemption and deduction from income" or "tax credit," which are called "shotoku-kojyo" and "zeigaku-kojyo" in Japanese, respectively (Cabinet Office 2019a). When the former is selected, ¥2,000 is deducted from one's donation amount, and that amount is then deducted from one's income. The income after the deduction is multiplied by an income tax rate to calculate one's income tax. Japan's income tax rates follow a progressive system, and therefore the tax reduction for the same donation amount is larger for higher income groups. In contrast, when the latter is selected, ¥2,000 is deducted from one's donation amount, that amount is multiplied by 40%, and then the amount after multiplication is directly deducted from one's income tax, regardless of income groups. Therefore, low- and middle-income groups can receive a larger tax reduction by selecting the tax credit option over exemption and deduction from income.[1] Countries offering both systems are rare, and the U.S., for example, does not offer the tax credit option. In this sense, Japan's rebate scheme is progressive on an international scale. However, the proportion of Japanese donors using the rebate remains low, and was recorded at 16.7% in 2018 (Cabinet Office 2019b). Furthermore, as is widely known, the level of individual donations in Japan is much lower than in other countries. Specifically, the total value of individual donations in Japan stood at 0.14% as a share of nominal GDP in 2016. This is only about one tenth of the U.S. donations (1.44%), about one quarter of the U.K. (0.54%), and about a quarter of that of South Korea (0.50%), which is also an East Asian nation (Giving Japan White Paper Research Society 2017). This raises the concern that the past improvements to the rebate scheme have not had enough impact on promoting Japanese people's donation behavior.

Second, the cost of using the rebate in Japan could be as high as or higher than in other countries. In Japan, individual income tax is withheld at source, and the income taxes of employed income earners are recalculated in December by their employers to correct any excess or deficiency. Thus, many Japanese workers do not usually need to file tax returns; however, they would need to do so in order to make use of the rebate scheme. Using the scheme would impose a psychological cost

[1] Imagine that a person with a taxable income of ¥6,000,000 donates ¥50,000. When he/she chooses the exemption and deduction from income, the refund will be ¥9,600. On the other hand, when the person chooses the tax credit, the refund will be ¥19,200.

on people because of performing an unfamiliar task, in addition to procedural costs. These costs could discourage people considering making donations using the rebate scheme from doing so.[2]

Matching increases the amount donated to a charity by combining the donation amounts of donors with that of a third-party. Since the charities or the third-party are usually responsible for the add-on donation process, donors' procedural and psychological costs will be smaller when using matching than when using the rebate. Thus, if matching is confirmed through experiments to be more effective than rebate in Japan, there is a potential to substantially increase donations made by Japanese people by implementing the matching scheme in the society. However, to the best of our knowledge, there have been no experimental studies in Japan directly comparing matching and rebate.[3] This study is quite important from both an academic and a policy perspective in that it is the first to conduct such an experimental comparison in Japan.

The remainder of this paper is structured as follows. Section 2 reviews experimental studies in economics that have compared rebate and matching schemes. Section 3 describes the experimental design in this study. Following basic results in Section 4, we conduct and present further analysis in Section 5. Section 6 discusses the results and their practical implications, and concludes while noting some limitations.

2. Literature Review on Rebate versus Matching

Eckel and Grossman (2003) point out that a matching rate (m) is a function of a rebate rate (r) as follows: $m = r/(1-r)$. This formula shows that a 1:1 matching is equivalent to a 50% rebate. In the former scheme, when one chooses to donate ¥5,000 to a charity, the same amount will be added to this donation, thus bringing the total amount donated to the charity is ¥10,000. In the latter scheme, when one chooses to donate ¥10,000 to a charity, half of the amount will be refunded, making the actual donation expenditure ¥5,000. Similarly, a 2:1 matching is equivalent to a 33% rebate, and a 4:1 matching is equivalent to a 20% rebate.[4]

Standard economic theory predicts that, when the donation price and all other factors are equal, there should be no difference in individuals' donation behavior for matching and rebate schemes. However, Eckel and Grossman (2003) reveal that donation rates and average donation expenditures for matching are higher than for rebate by employing a within-subject design where

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[2] According to data released by the by Cabinet Office (2019b), 13.4% of Japanese donors who did not use the rebate scheme in 2018 stated that it is because they did not file tax returns. This is the third major reason for not using the scheme. The top reason is that they did not know about this scheme (40.9%).

[3] In Japan, the possibility that rebate promotes donation behavior has been a subject of economic examination (Yamauchi 1997): however, again, there have been no experimental studies directly comparing rebate and matching.

[4] We find in the comparison of consumption and income taxes another example of people's different reactions under two essentially equivalent conditions. When all income goes to consumption, the relationship between the income tax rate (y) and the consumption tax rate (c) is as follows: $y= c/(1+c)$. Blumkin et al. (2012) show that subjects decrease their labor supply under an income tax system more than the equivalent consumption tax system. Kurokawa et al. (2020) show that subjects prefer an income tax over the equivalent consumption tax.

subjects are randomly exposed to both the schemes. Eckel and Grossman find similar results in 2006 when using a between-subject design where subjects are exposed to only one of the two schemes. Furthermore, this superiority of matching over rebate has been confirmed in multiple field experiments (Bekkers 2015; Eckel and Grossman 2008, 2009, 2017).

Thus, the relative effectiveness of matching has been robustly observed in various experimental studies; however, there exist debates on why matching can drive individuals' donation behavior more effectively than rebate, and some scholars have conducted multifaceted investigations. Eckel and Grossman argue that this tendency can be explained by people's preference (Lukas, Grossman and Eckel 2010). Specifically, matching has a "cooperative framing." Within this frame, since people can additionally gain a conformity utility by collaborating with others to donate, they will be more likely to donate. In contrast, rebate has a "reward framing." Within this frame, particularly for individuals with warm-glow (Andreoni 1989, 1990), receiving a refund will reduce their selfish utility by donating to a charity themselves. In other words, receiving a refund causes them to feel "greedy" (Benabou and Tirole 2006), and they will be less likely to donate.

However, other researchers raise the concern that the superiority of matching can be explained by people's confusion or misunderstanding rather than by their preference (Davis et al. 2005; Davis and Millner 2005). They conjecture if subjects in previous experiments may have incorrectly understood how each scheme works and the differences between them, and whether they may have chosen the same amount to be passed on to a charity in both schemes without deliberation, resulting in higher donation expenditures under matching than those after refund under rebate. Davis (2006) also proposes an "isolation effect," explaining subjects' behaviors of ignoring the schemes' differences and focusing on their initially selected amount. When individuals face a seemingly complex problem, they often only consider factors that they directly have control over or that have direct consequences for them. However, Eckel and Grossman have addressed other researchers' concerns by employing a between-subjects design where subjects face only one of the two schemes, by providing in advance calculation exercises to support their understanding for the assigned scheme, by afterwards checking their understanding of the experiment, and by providing information on all combinations of "initially selected amount," "reward to self," and "donated amount to the charity," to make their decisions more transparent. Then, Eckel and Grossman argue that the superiority of matching over rebate is still due to people's preference rather than their misunderstanding or confusion.

Furthermore, Blumenthal et al. (2012) note that in Eckel and Grossman's (2003, 2006) experimental designs, the matching and rebate rates are equivalent, while the budget constraint lines are not completely equivalent between the two schemes. For example, when the initial endowment is ¥1,000, a 1:1 matching will deliver a maximum of ¥2,000 to a recipient, while a 50% rebate will deliver only a maximum of ¥1,000 to them. For purely altruistic individuals who care about the

amount donated to a charity (Andreoni 1989, 1990), the budget constraint lines' slopes are the same between the two schemes, but the rebate line is partly truncated. A 1:1 matching allows subjects to select the amount donated to charity of between ¥0-¥2,000, while a 50% rebate allows them to select an amount between ¥0-¥1,000 only. However, more recent experiments by Lukas, Grossman and Eckel (2010) and Blumenthal et al. (2012) unify budget constraint lines, and still confirm the superiority of matching over rebate.

The purpose of this study is to clarify the difference in effectiveness between rebate and matching to determine the validity of the strategy for implementing matching schemes in Japan. Although it is unlikely that this study's results directly contribute to concluding the above debates over the mechanisms, the debates must be taken into account when constructing our experimental design and interpreting our experimental results. As we will show the details in the following section, our experiment can identify the subjects with confusion or misunderstanding. We further interpret our experimental results while empirically considering the impact of differences in budget constraint lines between the two schemes.

3. Experimental Design

3.1. Overview

Between March 19 and March 21, 2019, we conduct an economic experiment through MyVoice.com Ltd., which offers online surveys and experiments. Around 1 million adults living throughout Japan are registered on the company as response monitors. We sample 2,300 participants from these monitors in equal proportions by gender and age (age range: 20 and 69 years old), and conduct the online survey and economic experiment on this sample.

The experiment in this study is incentivized using "points," which can be exchanged for gift cards (nationwide gift cards, Amazon gift cards, App Store & iTunes gift cards, book cards, etc.) (MyVoice.com Ltd., 2020). The participants earn 70 points for answering the survey and can earn additional points, which vary depending on their choices in the experiment, as explained in the next section. Note that the exchange rate is 1 point = ¥1.[5]

[Figure 1]

The structure of this survey and experiment can be divided into three main parts (Figure 1). First, we present the participants with questions that capture their behavioral economic characteristics, including social, time, and risk preferences.[6] Second, we randomly divide them into rebate treatments, matching treatments, or a control, and conduct the economic experiment to

[5] One US dollar was approximately equivalent to 111 Japanese yen on March, 2019.
[6] Our questions about social, time, and risk preferences are based on the Global Preference Survey (Falk et al., 2018).

capture their donation behavior under each assigned condition. Specifically, we construct two groups for the rebate treatments (50% rebate and 20% rebate) and the matching treatments (1:1 matching and 4:1 matching). Third, we present participants with questions to capture their socio-economic attributes, including gender, marital status, number of children, years of education, household income, and place of residence, etc., and gather their responses.[7]

3.2. Procedures

In the introductory page to the experimental part of the survey, participants are informed that, in addition to the basic reward points for answering the survey, one in ten will have a chance to earn another reward (See the Figure Appendix A).[8] They are also informed that the additional reward points are worth ¥1,000, and that the following page will ask how much of the ¥1,000 they are willing to pass on to a social contribution project, assuming they could win and earn this additional reward.[9]

Here, to help the participants understand that this experiment is not hypothetical but that they will receive a real monetary reward, we set the following check-box confirmations: "If you win and earn 1,000 yen, your donation decision will be carried out as you answer," "After winning, you cannot change your answer. So, please think carefully before answering," and "If you do not win, you will not earn 1,000 yen, but your donation decision will not be carried out either." The participants have to confirm all the checkboxes in order to proceed to the following page. By implementing the above device, we ensure the incentive compatibility of their choices.

Following this, regardless of the randomly assigned groups, the participants see the following message, and are requested to donate to an organization engaged in afforestation activities.[10]

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[7] Our survey experiment falls outside the scope of the Japanese government's Ethical Guidelines for Medical and Health Research Involving Human Subjects, and there are no national guidelines in Japan for social and behavioral research. Although this study did not receive an ethical review, all respondents gave their informed consent to participate in this survey. After being informed about the purpose of the study and their right to withdraw from the survey, respondents agreed to participate. They were provided with the option "I want to stop participating in the survey" for all the questions. Completion of the entire survey experiment was considered to indicate respondent consent. The authors did not obtain any personal information about the respondents.

[8] Charness et al. (2016) review incentive schemes for laboratory experiments and report that there is no significant difference for experimental results between the schemes where incentives are paid to all participants, and the other schemes where incentives are randomly paid to a part of the participants.

[9] Since the additional reward of ¥1,000 is paid to 1 person out of 10, its expected value is ¥100. According to "Giving Japan 2017" (Giving Japan White Paper Research Society 2017), the median amount of Japanese people's donation is a few thousand yen. Using the incentive scheme of random payment, we allow participants to choose their donation amount from the endowment, which is close to that in the real world. Our analyses empirically address the concern that the random payment may influence the estimated results by controlling for the effect of participants' risk attitude.

[10] Before the experiment, we contacted the organization and obtained their approval for selecting them as the recipient. To ensure the recipient's credibility, we selected the recipient among specified public‐service promotion corporations, which are designated by a cabinet order as ones that significantly contribute to the promotion of public interest.

"Afforestation activities are currently being carried out around the world in order to reduce carbon dioxide emissions and prevent global warming. Your donation will help to support an organization engaged in the afforestation activities. Your donation will be used by the organization to restore rainforests in countries, including Indonesia, Myanmar, and Vietnam. Your generous support is greatly appreciated."

In addition to the above message, the survey screen for the participants in the four groups of rebate and matching display an "Important Notice," which informs them of the content of the assigned treatment (Figure 2).

[Figure 2]

[Table 1]

Table 1 briefly summarizes how each group works. When one initially selects the option to pass on ¥A to the organization in the control group, the actual donation expenditure is ¥A, the reward to oneself is ¥1,000 - ¥A, and the donated amount to the organization is ¥A. Table 1 shows a calculation example when A is ¥500 in the control group. Next, by comparing the formulas for each treatment group and calculation examples, we understand that a 20% rebate and a 4:1 matching are equivalent, and a 50% rebate and a 1:1 matching are equivalent. Specifically, when one initially selects ¥1,000 in a 20% rebate, ¥1,000 is donated to the organization, while the individual will receive a refund of ¥200, making the actual donation expenditure ¥800. If one initially selects ¥800 in a 4:1 matching, with the ¥200 additional contribution, the donated amount to the organization becomes ¥1,000. The two cases are identical in the price of donation. If the initial selection is ¥1,000 in a 50% rebate, ¥1,000 is donated to the organization, while the individual will receive a refund of ¥500, making the actual donation expenditure ¥500. If the initial donation is ¥500 in a 1:1 matching, with the ¥500 additional contribution, the donated amount to the organization becomes ¥1,000. Once again, the two cases are identical in the price of donation.

Finally, all the participants are asked;

"If you win and earn ¥1,000, how much of the ¥1,000 are you willing to pass on to the worldwide afforestation activities? Please answer in increments of ¥100."

Participants are required to initially select the amount to pass on to the organization between ¥0 and ¥1,000.

Even after the participants read their treatment message, it may be still difficult for them

to correctly understand the relationship between the "initially selected amount," "reward to self," and "donated amount to the charity." If many of the participants do not understand this relationship, their selection will be due not to their "preference" as proposed by Eckel and Grossman, but rather due to their "confusion and misunderstanding" as proposed by other researchers. In order to consider this concern, we follow the procedure used in previous studies, and display one calculation example (when initially selecting ¥500), along with two calculation exercises (when initially selecting ¥1,000 and ¥0) (See the Figure Appendices B and C). By so doing, we help the participants understand their assigned schemes.

Furthermore, we set up the survey screen to automatically calculate and display the "initially selected amount," "reward to self," and "donated amount to the charity" after the participants choose their initial amount (See the Figure Appendix D). Then, if they are satisfied with the calculated results, they are required to click a button to confirm their selection. These features are useful in preventing confusion or misunderstanding and the "isolation effect," as pointed out in previous studies.

4. Basic Analysis

4.1. Balance Check

Table 2 reports the means and standard deviations of participants' gender, marital status, number of children, years of education, household income, and place of residence for each group to check the random allocation of participants between the five groups. We can confirm that there is no statistically significant difference in the means between the groups for all the variables in the table.[11]

[Table 2]

In the following sections, we estimate the effects of rebate and matching, while empirically considering the possibility that, in addition to the distribution of the socio-economic attributes described above, the distribution of behavioral economic characteristics, including social preference, time preference, and risk preference, may vary between the groups.

4.2. Results

[Table 3]

Table 3 compiles donation amounts by group, in line with the table presented in Eckel and Grossman

[11] When looking at household income, the mean of the control is ¥4.6 million, while the means of the 50% rebate and 1:1 matching are in the range of ¥4.9 million, the latter being approximately ¥300,000 higher; however, the difference is not statistically significant.

(2003). Row (1) shows the initially selected amount in response to the question "If you win and earn ¥1,000, how much of the ¥1,000 are you willing to pass on to the worldwide afforestation activities? Please answer in increments of ¥100." Row (2) shows the actual donation expenditure, which is the donation amount after refund in rebate. Row (2) is blank in the control and matching, showing that there is no change from the amount in row (1).

In row (3), by respectively comparing the control and four treatment groups, we find the following. First, the rebate treatments decrease the actual donation expenditure relative to the control. This tendency is strongly observed in particular for the 50% rebate treatment, where the average donation expenditure is approximately ¥126 lower compared to the control (p<.01). Assume that an individual who selects ¥500 in the control is actually assigned a 50% rebate. If they wish to keep the same donation expenditure as in a situation where they are assigned to the control, they need to select ¥1,000. However, in reality, although the initially selected amount indeed increases, the extent of that increase is not large, and the actual donation expenditure after refund becomes lower than in the control. The results do not show that rebate promotes donation behavior.

Second, the matching treatments increase the actual donation expenditure relative to the control. This tendency is strongly observed in particular in the 1:1 matching treatment, where the average donation expenditure is approximately ¥56 higher compared to the control (p<.01). Assume that the same individual who selects ¥500 in the control is actually assigned to a 1:1 matching treatment. If they wish to have the same amount donated to a charity as in a situation where they are assigned to the control, they only need to select ¥200 or ¥300. However, in reality, their initially selected amount changes toward an increase, not a decrease. Specifically, those who select ¥500 in the control actually select higher amounts, ¥600, ¥700, or more, in the matching treatment. This result suggests that matching promotes donation behavior, encouraging higher donation expenditure.

Row (4) confirms the above results from a different perspective. If the rebate and matching treatments have the same impact on donation behavior, then no difference should be observed when comparing the average actual donation expenditures between a 20% rebate and 4:1 matching, and between a 50% rebate and 1:1 matching treatment, respectively. However, we find that the average donation expenditure for the 4:1 matching is approximately ¥83 higher than for the 20% rebate (p<.01), and that the 1:1 matching is approximately ¥182 higher than for the 50% rebate (p<.01).

[Table 4]

[Figure 3]

In Table 4, we use OLS and Type 1 Tobit estimation models and estimate the effects of rebate and matching on actual donation expenditure, controlling for various covariates. Figure 3 also

presents the mean estimate and 95% confidence interval of the expenditure for each group. This shows that the statistical significance of the effects of the 20% rebate and 4:1 matching treatments compared to the control group depends on the choice of estimation method; however, the direct difference between the two treatments is robustly observed after controlling for the effects of socio-economic characteristics and behavioral economic variables, with a difference of approximately ¥80 (p<.01). In contrast, when compared to the control, the negative effect of the 50% rebate and the positive effect of the 1:1 matching treatments on the actual donation expenditures are large and statistically significant at least at the 5% level in all estimation methods and model specifications. Consequently, a direct difference between the two treatments is robustly observed, with a difference of approximately ¥170 (p<.01).

In summary, we find through an experiment conducted on a Japanese sample of 2,300 respondents that matching is superior to rebate in encouraging higher donation expenditures. This superiority is strongly and robustly observed in particular in the comparison of the 50% rebate and 1:1 matching treatments.[12] Our results are essentially consistent with the tendencies found in a series of experimental studies conducted by Eckel and Grossman.

5. Further Analysis

5.1. Confusion or Misunderstanding

This section examines the relationship between the understanding of how rebate or matching treatments work and their treatment effects. As explained in the Procedures section, this economic experiment provides participants with one calculation example and two calculation exercises to support their understanding of the treatment assigned to them. Specifically, we show formulae and the amounts of "reward to self" and "donated amount to the charity" in the case when they initially select ¥500 in their assigned treatment group. We then provide two calculation exercises asking what these two amounts would be, when initially selecting ¥1,000 and ¥0. However, we do not provide feedback as to whether their answers are correct or incorrect. Thus, there might be some participants who join the experiment without having their misunderstanding of the calculation process corrected. If the effects in Section 4 are generated mainly because of the participants with misunderstandings, the superiority of matching in this study would depend on their confusion and misunderstanding, unlike in Eckel and Grossman's case.

[Table 5]

[12] Table Appendix A shows the effect of each treatment on the binary choice of whether to donate. Although all the treatments increase the donation probability, the 20% rebate's effect is larger than that of 4:1 matching. Considering the results of Section 4.2, 20% rebate could be less effective than 4:1 matching in increasing the average donation expenditure (intensive margin), but more effective in increasing the donation probability (extensive margin). There is no statistically significant difference between 50% rebate and 1:1 matching in increasing the donation probability.

Table 5 shows the proportion of correct answers to the calculation exercises in each treatment group. The proportions are not high throughout the results, with the proportion of participants who correctly answer both questions being approximately 50%. Matching treatment results appear slightly easier to calculate. The proportion of correct answers for the 4:1 matching is about 9% higher than for the 20% rebate ($p<.01$), while that for the 1:1 matching is about 6% higher than for the 50% rebate ($p<.10$). However, that being said, more than half the participants incorrectly answered either of the questions for the 1:1 matching.

[Table 6]

First, we examine whether the superiority of matching over rebate is observed even after directly controlling for correct answers for both questions. Since we do not provide the exercises to the participants in the control, we assume that they are all sufficiently aware of the relationship between the "initially selected amount," "reward to self," and "donated amount to the charity." As shown in Table 1, the relationship in the control is quite simpler than in the four treatment groups, and therefore this assumption is plausible. Table 6 shows that correctly answering both questions, on average, increases the actual donation expenditure. However, even controlling for this effect, we still find a similar tendency, where matching encourages larger donations than rebate.

[Table 7]

Second, by dividing the participants into one group that correctly answers both questions and another group that does not, we estimate the effect of the matching scheme while taking the rebate scheme as a base. Table 7 shows that, regardless of whether the participants answer the two problems correctly, matching increases the actual donation expenditure more than rebate. When comparing the 20% rebate and the 4:1 matching treatments, the average donation expenditure under matching is about ¥80 higher than under rebate in both the correct-answer and the incorrect-answer samples (at least $p<.05$). When comparing the 50% rebate and the 1:1 matching treatments, the superiority of matching is more strongly observed within the correct-answer sample, while, even in the incorrect-answer sample, the average donation expenditure under matching is about ¥150 higher than under rebate ($p<.01$).

Based on the above findings, we can reject the concern that the results in Section 4 may be explained primarily by participants' confusion or misunderstanding. However, we cannot overlook the behavior of the incorrect-answer sample when using a rebate or matching as a method to encourage donations in the real world. Nearly half of the study participant answered questions

incorrectly, despite being provided with formulae and one calculation example beforehand. The proportion of individuals who do not correctly understand the schemes is likely to be much higher in reality. Therefore, the comparative results of the two schemes in the real world will depend on the behavior of people who misunderstand the schemes. However, the relative effectiveness of matching can also be observed in the incorrect-answer sample in this study. This study's results indicate that even if rebates and matching are provided to a more general population, matching can still promote donation behavior more than rebates.

Then, who correctly answers the calculation exercises, and who does not? Our simple correlation analysis shows that those with higher education, higher income, and those living in urban areas are more likely to answer both questions correctly. In other words, the mechanism behind the superiority of matching over rebate may vary across these segments.

5.2 Budget Constraint Lines

The experimental design of this study is based on Eckel and Grossman's studies (2003, 2006). As Blumenthal et al. (2012) point out, the price of donation is equivalent between rebate and matching, while their budget constraint lines are not completely the same. Specifically, people who would spend ¥1,000 on a donation in the control can spend only ¥500 in the 50% rebate. Even if they select the same initial amount of ¥1,000, 50% of that amount is refunded to them. In contrast, if they are assigned to the 1:1 matching, they can maintain the same ¥1,000 donation expenditure.

We confirm that the difference in the budget constraint lines does not critically determine our experimental results in the following two ways. First, we increase participants' endowment from ¥1,000 to ¥5,000 and ¥10,000 using hypothetical experimental questions. In this study, after the incentivized economic experiment, we set questions to ascertain how much of an endowment the participants are willing to pass on to the same recipient, when the endowment is changed to ¥5,000 and ¥10,000 under the same treatment. In these situations, there should be fewer cases in which some people in the rebate treatments who wish to maintain or increase their own donation expenditure are unable to do so due to their budget constraint.

[Table 8]

Table 8 shows that even after increasing the endowment, we still find that rebate has the effect of decreasing the actual donation expenditure and matching has the effect of increasing it. In particular, the average donation expenditure in the 50% rebate treatment is considerably lower than in the control, despite the high endowments allowing the participants to initially select higher amounts. Consequently, the superiority of the 1:1 matching over the 50% rebate is robustly found in both ¥5,000 and ¥10,000 endowments ($p<.01$). We also find this superiority in the comparison of the

20% rebate and 4:1 matching treatments: however, the statistical significance of their difference is relatively weak (p<.10).

Second, using the estimated parameters for the control group,[13] we calculate the predicted values for the four treatment groups for "how much they would spend on a donation if they were assigned the control." Then, we restrict the participants in 20% rebate and 50% rebate to those with a predicted value of ¥800 or less and to those with a predicted value of ¥500 or less, respectively. In other words, we use those who do not face a situation where the budget constraint causes a decrease in their donation expenditure in the rebate treatments. We also limit the participants in the control group to those with the actual donation amount of ¥800 or less and to those with that of ¥500 or less. We further impose both the restrictions on the participants in the 4:1 matching and 1:1 matching treatments. That is, we use those in the matching treatments who have the same maximum predicted value and actual donation expenditure as in the rebate treatments. Here it should be noted that the second restriction to the actual donation expenditure in the matching places the matching scheme's position at a relative disadvantage. For example, in the case of the 1:1 matching, this restriction excludes those who are predicted to have spent a donation amount of less than ¥500 in the control group and actually spent a larger donation amount in the 1:1 matching treatment. Since the participants with positive and larger individual treatment effects of matching are excluded from the analysis, this will diminish the average positive treatment effect.

[Table 9]

We find from Table 9 that 1:1 matching remains superior to 50% rebate under the disadvantageous condition. In columns 3 and 4, the restriction eliminates the superiority of the 4:1 matching over the 20% rebate. This may be evidence supporting that 4:1 matching's superiority in the past sections is accidentally generated by the difference in budget constraint lines.[14] In contrast, columns 7 and 8 show that the 50% rebate's effect of decreasing actual donation expenditure has disappeared, while the 1:1 matching's increasing effect is persistent, despite limiting the analysis sample in the 1:1 matching to those not only with a predicted value of ¥500 or less but also with the actual donation amount of ¥500 or less. Its effect size is about ¥50 and statistically significant (p<.01). This result strongly supports the relative effectiveness of the 1:1 matching treatment. In addition, we posit that the superiority of 1:1 matching over 50% is not conclusively influenced by

[13] More precisely, we use the control group's sample and regress the donation expenditure amount on the following socio-economic variables: gender, marital status, number of children, years of educations, household income, and place of residence. We then use the estimated parameters of these variables and predict the dependent variable's value for the four treatment groups.

[14] However, we also cannot deny the possibility that the additional and disadvantageous restriction to 4:1 matching decreases its treatment effect more than necessary and it hides 4:1 matching's superiority. Our sample restriction will work properly when matching's superiority is still observed.

the difference in their budget constraint lines.

6. Discussion, Limitations and Conclusions

This study uses a Japanese nationwide sample and experimentally compares rebate and matching, both of which are subsidy schemes intended to lower the price of donation and encourage donation behavior in individuals. The experimental results show that even if the donation price is equal between matching and rebate treatments, matching, which lowers the price by adding a contribution from a third-party, increases people's actual donation expenditure more than rebate, which lowers the price through refunds. Specifically, the results show that the actual donation expenditure drops by about ¥126 when assigned to the 50% rebate as compared to the control, while the actual donation expenditure increases by about ¥56 when assigned to the 1:1 matching (which has essentially the same donation price as 50% rebate). This tendency is consistent with the results observed in a series of experimental studies by Eckel and Grossman. We further empirically confirm that our findings are not critically influenced by people's confusion or misunderstanding, or the difference in budget constraint lines in rebate and matching.

Matching has a greater promoting effect on individuals' donation behavior than rebate. This implies that implementing the matching scheme in Japan has a greater potential to increase donations among the Japanese people. The Japanese government has so far focused on improving the rebate scheme, while there remains considerable scope for the implementation of matching. According to the Economic Planning Agency (2008), the matching scheme in Japan has been narrowly understood as "a scheme for corporations to match the donations of their employees to charities," and frequently adopted for promoting their employees' social contribution activities. However, there are only a few corporations that have introduced the matching scheme. For example, in 2019, about 78% of the corporations that responded to a survey did not implement the scheme (Toyo Keizai Inc. 2020). It is necessary to consider measures to increase the number of corporations that adopt the matching scheme, as well as to expand this scheme outside of corporations.

It should be noted that matching is not a panacea either. Matching induces larger donations than rebate, but it does not have a positive effect on all individuals' donations. Under the matching scheme, some people might wish to increase their out-of-pocket donation expenditure, but others might wish to reduce it. The latter group may think that even if they reduce their own out-of-pocket donation expenditure, the donation amount received by a charity through matching is sufficient. This phenomenon is known as "crowding out" in economics (Karlan and List 2007; Huck and Rasul 2011). Recent economic studies have begun to explore options to prevent crowding out and improve the efficiency of the matching scheme, specifically proposing that the matched amount is donated to other charitable projects, setting some thresholds, etc. (Adena and Huck 2017, 2019; Charness and Holder 2019; Huck, Rasul and Shephard 2015). It is also necessary to consider these

options before implementing the matching scheme in the Japanese society. In other words, such options could further increase the superiority of matching over rebate.

We now discuss the limitations of this study. The participants in our economic experiment receive their endowment as a windfall, as in Eckel and Grossman's studies. Thus, their behavior may not be consistent with the behavior of people in the real world, many of who make donations from their salaries. In addition, participants in previous laboratory experiments could freely choose an organization as a donation recipient from multiple NPOs, while in this study, we specify the organization in advance: one engaged in afforestation activities. In other words, our study participants may include a large sample of people who had no previous intention to donate to the organization. Our experimental results may be affected by the phenomena where such the people are encouraged to make a larger donation by the matching scheme. Some future research should confirm the generalizability of this study's results before promoting the implementation of matching in the Japanese society. Nevertheless, we believe that this study has sufficient academic and policy significance in that it is the first to experimentally demonstrate the superiority of matching over rebate in Japan.

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Figure and Tables

Figure 1. The Survey and Experimental Structure

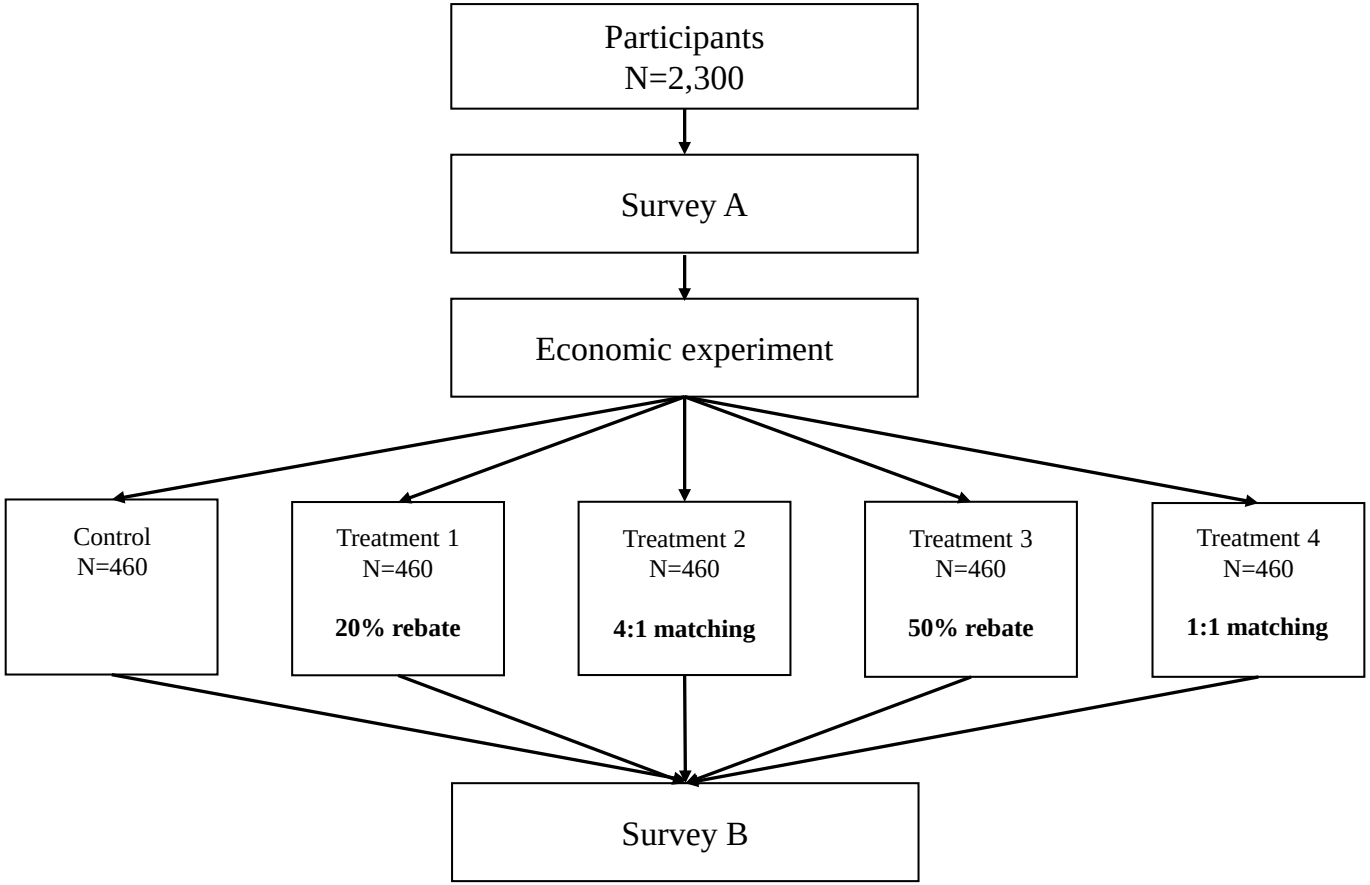


Figure 2. Treatment Messages

20% rebate:

Important Notice:

For every donation amount you pass on to the charity,
the experimenter will refund 20% of the amount to you.

4:1 matching:

Important Notice:

For every donation amount you pass on to the charity,
the experimenter will match it with an additional 25% of the amount.

50% rebate:

Important Notice:

For every donation amount you pass on to the charity,
the experimenter will refund 50% of the amount to you.

1:1 matching:

Important Notice:

For every donation amount you pass on to the charity,
the experimenter will match it with an additional equal amount.

Table 1. Contents of Treatments

	Control	**20% rebate**		**4:1 matching**		**50% rebate**		**1:1 matching**	
1. Initially selected amount	A	A	1,000 yen	A	800 yen	A	1,000 yen	A	500 yen
2. Actual donation expenditure	A	0.80*A	800 yen	A	800 yen	0.50*A	500 yen	A	500 yen
3. Reward to self	1000-A	1000-0.80*A	200 yen	1000-A	200 yen	1000-0.50*A	500 yen	1000-A	500 yen
4. Donated amount to the charity	A	A	1,000 yen	1.25*A	1,000 yen	A	1,000 yen	2.00*A	1000 yen

Table 2. Balance Check

	Control		**20% rebate**		**4:1 matching**		**50% rebate**		**1:1 matching**	
	N=460		N=460		N=460		N=460		N=460	
Variable name:	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Female dummy	0.50	[0.50]	0.50	[0.50]	0.50	[0.50]	0.50	[0.50]	0.50	[0.50]
Married dummy	0.50	[0.50]	0.57	[0.50]	0.52	[0.50]	0.55	[0.50]	0.53	[0.50]
Number of sons	0.43	[0.71]	0.49	[0.78]	0.47	[0.75]	0.52	[0.79]	0.46	[0.73]
Number of daughters	0.45	[0.71]	0.44	[0.73]	0.48	[0.73]	0.45	[0.71]	0.41	[0.68]
Educational years	14.54	[2.20]	14.56	[2.08]	14.59	[2.07]	14.45	[2.13]	14.58	[2.16]
Household income (10,000 yen)	462.93	[390.94]	479.02	[446.37]	479.02	[406.24]	495.43	[428.42]	493.26	[429.19]
No income information	0.17	[0.38]	0.20	[0.40]	0.18	[0.38]	0.18	[0.38]	0.18	[0.38]
Large city residence dummy	0.37	[0.48]	0.35	[0.48]	0.35	[0.48]	0.33	[0.47]	0.38	[0.49]

Note: Some respondents did not answered annual household income. We imputed the average amout of the income for such respondents while considering that they did not answer it by using the variable of no income information.

Table 3. Basic Descriptive Result

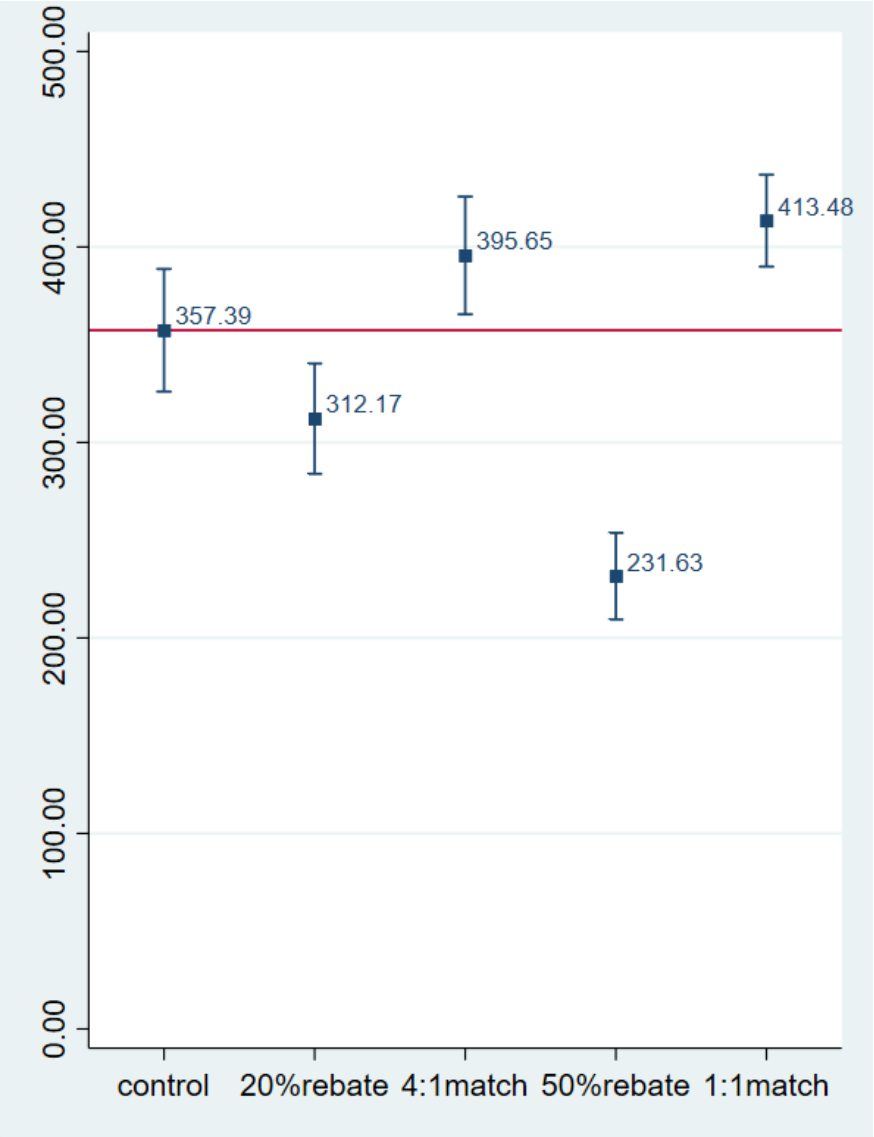
	Control		**20% rebate**		**4:1 matching**		**50% rebate**		**1:1 matching**	
Number of observations:	N=460		N=460		N=460		N=460		N=460	
Price of donating 1 yen to the charity:	1 yen		0.8 yen		0.8 yen		0.5 yen		0.5 yen	
	Mean	[Standard Deviation] (Standard Error)	Mean	[Standard Deviation] (Standard Error)	Mean	[Standard Deviation] (Standard Error)	Mean	[Standard Deviation] (Standard Error)	Mean	(Standard Deviation) [Standard Error]
(1) Initially selected amount	357.39	[340.65]	390.22	[318.72]	395.65	[333.89]	463.26	[360.31]	413.48	[329.51]
	A				C				E	
(2) Actual donation expenditure			312.17	[254.98]			231.63	[180.16]		
			B				D			
(3) Control vs Treatments			-45.22	(19.84)	38.26	(22.24)	-125.76	(17.97)	56.09	(22.10)
			B-A ≠ 0		C-A ≠ 0		D-A ≠ 0		E-A ≠ 0	
(4) Rebate vs Matching					83.48	(19.59)			181.85	(17.51)
					C-B ≠ 0				E-D ≠ 0	

Table 4. Basic Regression Result

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	Actual donation expenditure									
Endowment:	1,000 yen									
Estimation method:	OLS					Tobit (Type 1)				
20% rebate	-45.217**	-47.491**	-40.752***	Basement	—	-20.185	-22.410	-15.706	Basement	—
	(19.319)	(17.827)	(14.269)			(19.125)	(18.969)	(18.054)		
4:1 matching	38.261	35.320	39.030*	81.958***	—	40.750**	37.867**	42.097**	60.924***	—
	(23.892)	(23.871)	(20.622)	(21.320)		(19.152)	(18.967)	(18.053)	(18.387)	
50% rebate	-125.761***	-128.272***	-121.341***	—	Basememt	-92.445***	-95.894***	-92.593***	—	Basement
	(19.086)	(18.130)	(14.577)			(19.209)	(19.057)	(18.153)		
1:1 matching	56.087***	55.310***	50.863***	—	172.774***	59.972***	59.603***	56.410***	—	152.925***
	(17.744)	(17.157)	(14.880)		(13.233)	(19.119)	(18.945)	(18.018)		(16.392)
Socio-economic attributes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Behavioral economic attributes	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Number of observations	2,300	2,300	2,300	920	920	2,300	2,300	2,300	920	920

Notes: We use cluster robust standard errors in parentheses for OLS estimations, while we use robust standard errors in parentheses for Type 1 Tobit estimations. *** p<0.01, ** p<0.05, * p<0.1. In columns 1-3 and 6-8, we use the sample of all the groups. In columns 4 and 5, we use the sample of 20% rebate and 4:1 matching treatment groups, and in columns 9 and 10, we use the sample of 50% rebate and 1:1 matching treatment groups.

Figure 3. Actual Donation Expenditure by Group



Note: The vertical line represents a 95% confidence interval.

Table 5. Proportion of Correct Answers

Number of observations:	**20% rebate** N=460		**4:1 matching** N=460		**50% rebate** N=460		**1:1 matching** N=460	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Percentage of correct answers for the 1st calculation exercise	0.67	[0.47]	0.72	[0.45]	0.53	[0.50]	0.57	[0.50]
Percentage of correct answers for the 2nd calculation exercise	0.65	[0.48]	0.69	[0.46]	0.63	[0.48]	0.66	[0.48]
Percentage of correct answers for both of the calculation exercises	0.52	[0.50]	0.61	[0.49]	0.43	[0.50]	0.49	[0.50]

Table 6. Further Analysis: Confusion or Misunderstanding (a)

	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Actual donation expenditure				
Endowment:	1,000 yen				
Estimation method:	OLS				
20% rebate	-26.914	-30.413	-26.392	Basement	—
	(19.860)	(18.900)	(15.745)		
4:1 matching	53.251**	49.424**	50.844**	80.979***	—
	(23.393)	(23.578)	(20.381)	(21.593)	
50% rebate	-103.896***	-107.884***	-104.122***	—	Basememt
	(20.498)	(19.625)	(16.484)		
1:1 matching	75.550***	73.658***	66.169***	—	169.526***
	(17.959)	(17.707)	(16.216)		(13.396)
Correct Answer	38.097***	35.835***	30.029**	11.707	49.365***
	(13.304)	(11.998)	(11.245)	(17.157)	(12.085)
Socio-economic attributes	No	Yes	Yes	Yes	Yes
Behavioral economic attributes	No	No	Yes	Yes	Yes
Number of observations	2,300	2,300	2,300	920	920

Notes: Cluster robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. In columns 1-3, we use the sample of all the groups. In column 4, we use the sample of 20% rebate and 4:1 matching treatment groups, and in column 5, we use the sample of 50% rebate and 1:1 matching treatment groups.

Table 7. Further Analysis: Confusion or Misunderstanding (b)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Actual donation expenditure							
Endowment:	1,000 yen							
Estimation method:	OLS							
Comparison:	20% rebate versus 4:1 matching				50% rebate versus 1:1 matching			
Correct or incorrect:	Correct answers		Incorrect answers		Correct answers		Incorrect answers	
4:1 macthing	79.259***	81.302***	86.535**	83.333***				
Basement: 20% rebate	(22.935)	(22.364)	(32.257)	(27.892)				
1:1 macthing					209.613***	195.890***	151.040***	149.452***
Basement: 50% rebate					(25.492)	(21.303)	(18.629)	(16.694)
Socio-economic attributes	No	Yes	No	Yes	No	Yes	No	Yes
Behavioral economic attributes	No	Yes	No	Yes	No	Yes	No	Yes
Number of observations	518	518	402	402	421	421	499	499

Notes: Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. In columns 1-4, we use the sample of 20% rebate and 4:1 matching treatment groups, and in columns 5-8, we use the sample of 50% rebate and 1:1 matching treatment groups.

Table 8. Further Analysis: Budget Constraint Lines (a)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	Actual donation expenditure									
Endowment:	5,000 yen					10,000 yen				
Estimation method:	OLS									
20% rebate	-87.913	-99.177	-79.057	Basement	—	-177.522	-196.865	-156.324	Basement	—
	(60.801)	(61.050)	(50.146)			(128.985)	(133.444)	(116.442)		
4:1 matching	106.739	97.984	102.609	183.438**	—	119.565	101.728	114.248	282.105*	—
	(83.451)	(84.422)	(72.740)	(77.075)		(167.264)	(168.612)	(149.255)	(154.543)	
50% rebate	-287.391***	-297.132***	-276.633***	—	Basememt	-501.304***	-519.147***	-479.422***	—	Basement
	(59.675)	(58.662)	(53.564)			(128.546)	(130.099)	(123.651)		
1:1 matching	145.870***	137.849**	122.329**	—	400.481***	301.522***	287.832**	260.143**	—	737.273***
	(52.632)	(53.115)	(55.260)		(62.698)	(105.554)	(109.433)	(113.566)		(127.355)
Socio-economic attributes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Behavioral economic attributes	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Number of observations	2,300	2,300	2,300	920	920	2,300	2,300	2,300	920	920

Notes: Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. In columns 1-3 and 6-8, we use the sample of all the groups. In columns 4 and 9, we use the sample of 20% rebate and 4:1 matching treatment groups, and in columns 5 and 10, we use the sample of 50% rebate and 1:1 matching treatment groups.

Table 9. Further Analysis: Budget Constraint Lines (b)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Actual donation expenditure							
Endowment:	1,000 yen							
Estimation method:	OLS							
Comparison:	20% rebate versus 4:1 matching				50% rebate versus 1:1 matching			
20% rebate	62.151***	Basement	63.834***	Basement	_	_	_	_
	(13.803)		(13.003)					
4:1 matching	141.545***	79.628***	38.181***	-24.805	_	_	_	_
	(17.815)	(20.203)	(12.445)	(15.762)				
50% rebate	_	_	_	_	0.499	Basement	1.717	Basement
					(11.353)		(11.035)	
1:1 matching	_	_	_	_	170.861***	168.883***	49.443***	48.868***
					(13.996)	(14.196)	(10.974)	(11.605)
Socio-economic attributes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Behavioral economic attributes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maximum amount restriction for matching	No	No	Yes	Yes	No	No	Yes	Yes
Number of observations	1,309	920	1,235	846	1,191	817	1,108	734

Notes: Cluster robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. In columns 1 and 3, we use the sample of the control group and 20% rebate and 4:1 matching treatment groups. In columns 2 and 4, we use the sample of 20% rebate and 4:1 matching treatment groups. In columns 5 and 7, we use the sample of the control group and 50% rebate and 1:1 matching treatment groups. In columns 6 and 8, we use the sample of 50% rebate and 1:1 matching treatment groups.

Appendix.

Figure Appendix A. The Introductory Page to the Experiment

In a drawing (one in ten), you will win and earn reward points worth 1,000 yen. Winners will be notified by email at a later date.

————

You can pass a part or all of the earned 1,000 yen to a social contribution project.

From the next page, the experimenter will introduce to you the content of the project.
Assuming you could earn 1,000 yen, please answer how much of the 1,000 yen you will pass on to the project.

————

☐ If you win and earn 1,000 yen, your donation decision will be carried out as you answer.
☐ After winning, you cannot change your answer. So, please think carefully before answering.
☐ If you do not win, you will not earn 1,000 yen, but your donation decision will not be carried out either.

Figure Appendix B. The Screen for the Calculation Example (The Case of 1:1 Matching)

For example, if you initially select **¥500** under this scheme, your reward amount will be **¥500** and the amount donated to the afforestation activities will be **¥1,000**.

Initially selected amount = **¥500**
Reward to self = ¥1,000 - Initially selected amount (¥500) = **¥500**
Donated amount to the charity = Initially selected amount (¥500) × 2 = **¥1,000**

Figure Appendix C. The Screen for the Calculation Exercises (The Case of 1:1 Matching)

Calculation exercise 1. Please select the correct combination of the amounts that enter A and B in the text.

If you initially select **¥1,000** under this scheme, your reward amount will be **A** and the amount donated to the afforestation activities will be **B**.

1) A: ¥0 B: ¥1,000
2) A: ¥0 B: ¥2,000
3) A: ¥1,000 B: ¥1,000

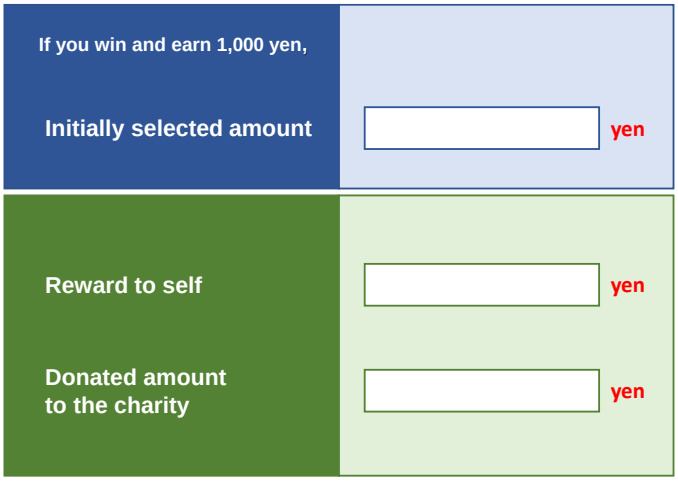
Calculation exercise 2. Please select the correct combination of the amounts that enter C and D in the text.

If you initially select **¥0** under this scheme, your reward amount will be **C** and the amount donated to the afforestation activities will be **D**.

1) C: ¥1,000 D: ¥0
2) C: ¥0 D: ¥1,000
3) C: ¥1,000 D: ¥1,000

Notes: The numbers of correct answers are 2) and 1), respectively. The initially selected amounts and the numbers of correct answers are common between 1:1 matching are the other treatments (20% rebate, 4:1 matching, and 50% rebate).

Figure Appendix D. The Screen for the Donation Decision



If you are satisfied with the above amounts, please click the "Next" button.
If you want to change them, please select again the amount that you pass on to the charity.

Table Appendix A. Whether to Donate (Binary Choice)

	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Whether to Donate (Binary Choice)				
Endowment:	1,000 yen				
Estimation method:	Linear Probability Model				
20% rebate	0.109***	0.107***	0.116***	Basement	—
	(0.025)	(0.024)	(0.021)		
4:1 matching	0.052**	0.049*	0.053**	-0.060**	—
	(0.025)	(0.025)	(0.020)	(0.024)	
50% rebate	0.083***	0.080***	0.088***	—	Basememt
	(0.024)	(0.023)	(0.019)		
1:1 matching	0.080***	0.080***	0.077***	—	-0.010
	(0.025)	(0.025)	(0.023)		(0.021)
Socio-economic attributes	No	Yes	Yes	Yes	Yes
Behavioral economic attributes	No	No	Yes	Yes	Yes
Number of observations	2,300	2,300	2,300	920	920

Notes: We use cluster robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. In columns 1-3, we use the sample of all the groups. In column 4, we use the sample of 20% rebate and 4:1 matching treatment groups, and in column 5, we use the sample of 50% rebate and 1:1 matching treatment groups.