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Giving opportunity to work makes people un-egalitarian

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Abstract

To examine the relationship between working and the egalitarian, we conduct the experiments in the non-real-effort and the real-effort tasks. Our main finding is that giving the opportunity to work itself creates un-egalitarianism in people. Then, we examine what factors affect the formation of egalitarian in the real-effort task.

Keywords: Egalitarian; Real-effort task; Non-real-effort task; Big-five test

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1 Introduction

1.1 Motivation

The egalitarianism is one of cornerstones in the field of other-regarding preferences. Egalitarian prefers equal distribution between himself and the

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partner over various types of unequal distributions. Following the influential works in this field, the egalitarian type dramatically increases with age during childhood (e.g., Sutter 2007, Fehr et al 2008). Although the types of preferences are mixed to some extent throughout adolescence (e.g., Bartling et al. 2009, Fehr et al. 2013), a large part of people are still egalitarian. For instance, in Bartling et al. (2009), 63 percent of 118 participants are egalitarian.

The existing result that more than half, such a large proportion of people is egalitarian would be powerful and incredible to some extent. This is because in real society, there would be quite a few un-egalitarians, which would be plausible because the society with scarcity, which always gives the unequal distribution to people, cannot fulfill all human wants and needs, thereby being able to see that a lot of people like to fulfill own desire by being superior to others in salary, position and power. Based on this fact, for instance, a lot of researchers in the theoretical-economic literature focus on the other-regarding preferences such as status-seeking preferences (e.g., Corneo and Jeanne 2001 and Kawamoto, 2009), the envy about consumption (e.g., García-Peñalosa and Turnovsky 2008 and Barnett et al. 2010), the loss aversion (e.g., Tversky and Kahneman 1991 and 1992) and the disappointment aversion (e.g., Gul 1991) which would lead to unequal distribution at large.

To solve the gap observed between the laboratory experiments and the real society, we re-examine the perception of egalitarianism in the laboratory experiment. The important element of this paper is to give the opportunity to work to people, especially the decision makers, thereby confirming whether they still want to be egalitarian in RET (real-effort task).

Intuitively, one may guess that if their own monetary rewards which reflect the achievement of RET do not decrease in absolute terms, which is actually conducted in our experiment, they still keep their egalitarianism even in RET; however, we presume giving the opportunity to work may raise questions about whether this is the case in practice.

The effects of RET on individuals' decisions have received much attention in the experimental literature.[1] Erkal et al (2011) conducts the laboratory experiment to examine the role of RET for giving. Their important contribution is to give the participants the opportunities to earn their income before they are asked for giving. Against our intuition that the richer contributes to others larger than the poorer, Erkal et al (2011) reveals an interesting human behavior that the richest person makes giving to others less than the second richest person. The reason is that the proportion of self-interested individuals is substantially higher among the richest groups. The importance is that the pro-social behavior such as the charitable giving may be different between non-RET and RET, which gives the motivation of this manuscript because we expect giving the opportunity to work itself has the role for the pro-social behavior defined in the egalitarianism, which would lead to the difference of the egalitarianism between non-RET and RET.

[1]For instance, van Dijk et al (2001) examine the role of different payment schemes in RET. Brüggen and Strobel (2007) examine the differences between the real and the chosen efforts (e.g., the reaction to wage offers). David and Prowse (2012) focus on the disappointment averse preferences in RET. Johannes et al (2011) examine the reference points in RET based on the theory of reference-dependent preferences.

1.2 The related literature: the allocation problems after non-RET and RET

In addition to the above manuscript Erkal et al (2011), our paper is related to Almås et al (2010) and Bartling et al (2009). We made use of simple four binary choice problems given in Table 1(a). This was the same as Bartling et al (2009) except for the amount of the monetary rewards.[2] The choice problem was comprised of two types of unequal distribution, that is, the reward for the decision maker was more than the reward for the matched partner (the pro-social and the costly pro-social problems) or less than that (the envy and the costly envy problems). In addition, the difference between the pro-social and the costly pro-social problem was if the decision maker preferred the equal distribution, they would not lose any monetary reward in the pro-social problem, but would lose 300 yen (around $3.00) in the costly pro-social problem. Similarly, the difference between the envy and the costly envy problems was the decision maker had to incur cost to choose the equal distribution in the costly envy problem, but not the envy problem.

By choosing the preferred answer for each question in Table 1(a), we can divide the other-regarding preferences into six types given in Table 2 where each type was independent to each other. In fact, if the subjects selected the equal distribution in all four problems, they would be considered Egalitarianism. When the subjects chose the equal distributions in the pro-social and the costly pro-social problems (or the envy and the costly envy problems) but were not egalitarian, they were named Aheadness

[2]In Bartling et al (2009), around 13 dollars were paid as the base payment in equal distributions; instead, we paid around 5 dollars.

aversion (or Behindness aversion). Welfare type selected the choices which maximize their total rewards for all four problems and Egoism type chose the unequal distribution which gave the decision maker a greater reward in each problem where notice that Welfare type could be one of Egoism types; however, they were explicitly separated. Finally, the subjects who were not classified as the above types were named Other.

The difference between our manuscript and Bartling et al (2009) is the presence of RET. To examine whether the subjects like to select equal distribution in RET, we conduct not only the allocation problems of non-RET but also those of RET given in Table 1(b) where SE (self-earn) in Table 1(b) represents the monetary reward which reflects the achievement in RET.

Next, our experiment is the same as Erkal et al (2011) and Almås et al (2010) in the sense that after RET, the subjects face the allocation problem (dictator game).[3] Then, we need to mention the differences of allocation problems among Erkal et al (2011), Almås et al (2010) and our manuscript, which would be important to clarify our contributions.

First, the allocation problem in Erkal et al (2011) and Almås et al (2010) is given only once to attain each purpose. Alternatively, although our main

[3]In Erkal et al (2011), the recruited students in university are grouped by four persons, ranked according to the achievement of Encryption task, and receive the fixed amount of monetary rewards according to the ranking. In detail, the first, the second, the third and the fourth-ranked persons receive \$60, \$45, \$30 and \$15, respectively. After RET, the subjects are asked if they give their earnings to their group members.

In Almås et al (2010), after RET, the dictators, 5−13th grade children, are asked to choose how much of the sum of individual earnings for the pair they distribute between themselves and the partner where Almås et al. (2010) use two versions of dictator game; however, we focus on only the related dictator game.

concern is the egalitarianism, our subjects are classified as the various types of other-regarding preferences as given in Table 2. The primary reason is based on our presumption that the ratio of egalitarian in RET decreases compared with non-RET. Therefore, one of our concerns is to confirm which types of other-regarding preferences increase in RET by the decrease in egalitarian. Moreover, owing to the detail distinction of preferences, we give the finding unsolved in the existing paper. For instance, as in Almås et al (2010), we find that the visible achievement of RET affects the selection of unequal distributions. We will further show that the unequal distributions of Behindness averse and Welfare defined in Table 2 are only affected.

Second, and more importantly, in the allocation problems of Erkal et al (2011) and Almås et al (2010), the subjects must decrease their own monetary rewards if they allocate their earnings to the other to attain equal distributions, meaning that the pursuit of egalitarianism always brings self-sacrifice. Needless to say, this self-sacrifice disturbs the subjects to select the egalitarian distributions. In our allocation problems given Table 1(b), the self-sacrifice is excluded in the mean that the subjects always obtain the monetary rewards which reflect the achievement of RET (i.e., SE) or more, which would be comfortable and not be dissatisfied for the subjects to become the egalitarianism.[4]

Finally, related to the second difference, the monetary rewards of the subjects and their partner are simultaneously changed in Erkal et al (2011) and Almås et al (2010). It would be hard to see what the decision maker

[4]Broadly, in the costly pro-social/envy problems the subjects incur costs to become the egalitarian in the sense that they have the chance to obtain the monetary rewards greater than SE but give up the additional rewards to select the egalitarianism. However, notice that the subjects do not have any costs to attain equality in pro-social/envy problems.

cares about in reality. Strictly speaking, we cannot see whether the decision maker selects the monetary rewards reflecting the visible achievement of only themselves or both themselves and the matched partner. For instance, consider that the decision markers decide to increase their own monetary rewards, which implies that the monetary rewards of matched partner decreases at the same time. Then, if the decision makers are egoists, we can argue they increase the monetary rewards of themselves by caring about only themselves; however, if they are behindness averse, they care about not only themselves but also the partner because their concern is to be in the superior position relative to the partner. Because the monetary rewards of the subjects change irrespective of those of the matched partner in our experiment, we can correctly see what the subjects care about in determining their preferred alternatives, and hence, we can make a distinction between egoism and behindness aversion.

The article proceeds in the following way. Section 2 gives the experimental design and procedures in the non-RET and RET. Section 3 shows the main results of our experiments, and Section 4 gives those in the regressive analysis. Section 5 concludes.

2 Experimental designs and procedure

We conducted two experiments in 2013; BAW (before and after work) in February and AW (after work) in November. BAW experiment was conducted at two large university in Japan, Kyushu Sangyo University (KSU) with 100 participants (male=51) and Kyushu University (KU) with 90 participants (male=49). AW experiment was conducted at KSU with 155

participants (male=110). We used 3-5 classrooms simultaneously and the participants were divided into each class having no more than 15 participants per class.

2.1 BAW experiment

After selected their ID and group number by drawing once from a sealed box, the subjects proceeded into one of the prepared classrooms (See Appendix A for detailed material of the entire experiment). To maintain the anonymity of the subjects, each subject was seated individually at a table marked with their ID number and were instructed not to have any contact with other group members.

BAW experiment was composed of two parts, non-RET (non-real-effort task) and RET (real-effort task). At the onset of non-RET, the subjects were informed they were matched with an anonymous partner in another classroom and were given the ID number of the anonymous partner. They were also informed that they were the decision makers and would have to choose the preferred allocation for the monetary rewards between themselves and the matched anonymous partner. The four binary problems in Table 1(a) were presented in a random order.

Important points are as follows. First, we did not deceive the subjects in the point that they were informed that they would have two tasks at the beginning of BAW experiment where we emphasized that two tasks were completely independent each other and different. Second, the instructions for the next task were not disclosed until the subjects completed non-RET, which ensured the subjects had no prior knowledge to influence their answers to the questions in non-RET. Third, the subjects were told that after

non-RET, they would no longer make any decisions for their anonymous partner, and their anonymous partner would not make any decisions for them through the entire experiment. Fourth, although each subject answered four binary questions given in Table 1(a), they were told that only one would be randomly played out in reality where a ball labeled 1-4 was drawn from a sealed box at the completion of non-RET.[5] Lastly, they confirmed the amount of monetary rewards at the end of non-RET.

After non-RET was completed, we proceeded to RET. In RET, we firstly described the work which was to prepare invitation letters for an academic conference.[6] In a short period of time and with no breaks (5-20 minutes), we asked the subjects to address the envelopes according to the address list provided, fold the conference invitation into four, and put the fold letter into the addressed envelope.[7] The invitations were printed in both Japanese and English in hopes the subjects would seriously do the work believing its validity. The subjects were then informed of the working time and the unit reward for every completed envelope. After the instructions were given, we distributed envelopes, the invitation letters and the address list. Upon completion of the work, the subjects were given proof of their monetary rewards for completing the envelope work.

Hereafter, we reiterated that each student had an anonymous partner

[5]To confirm whether the subjects understood the decision procedure of monetary reward correctly, all of them were asked to answer our question and all subjects answered correctly. See Appendix A.

[6]Because we emphasized that the first and second tasks were independently conducted, all subjects did not have asked any questions to us.

[7]For instance, Falk and Ichino (2006) make use of the envelope work in the laboratory experiment to examine the peer effects on output where our envelope task was simpler than their task in the sense that the subjects in our experiment did not use staples and rubber bands to tie up some sheets of papers and envelopes together.

doing the same work in another class. They were informed that the matched class number, the ID of anonymous partner and the working condition (working time and unit reward) were not the same as those in non-RET, and as before they were the decision makers requiring them to answer the allocation problems given in Table 1(b).[8]

In addition to Section 1.2., we notice the following. First, the subjects were informed about the allocation problems after the envelope work was over.[9] We intentionally kept the students unaware of the allocation problems during the work period. As a result, their work efforts were not affected by any previous knowledge of distribution problems under a new anonymous partner.

Second, the subjects at KU matched the new anonymous partner once, that is, they answered four problems in Table 1(b) only once. Alternatively, in order to collect richer data, the subjects at KSU answered four problems in Table 1(b) three times where the partner changed each time and furthermore we avoided the subjects encountering a partner with the same working conditions multiple times.[10]

Third, we needed to explain the subjects about why they had to de-

[8]We did not inform of the achievement of completed envelopes of the matched partner as in Almås (2010). Considering that it would be hard for us to see the others' achievement in the real life, this setting would be reasonable.

[9]At first, we planned to make the additional experiment that the information on the allocation problem is given *before* the envelope work start. This is because we had expected the visible achievement of envelop task affects the egalitarianism to some extent in BAW/AW experiments. If so, we had expected to confirm interesting difference between BAW/AW and the additional experiment as confirmed in Erkal et al (2011). However, as confirmed later, the visible achievement did not affect the egalitarianism in BAW/AW experiments; therefore, the additional experiment was canceled.

[10]As explained later, the repetition itself, caused by the change of partners, did not affect the selection for the allocation problems.

termine the monetary rewards of anonymous partner at the envelope work because the anonymous partner might not receive the pay based on their work performance. Therefore, over half of subjects, 105 subjects (45 at KU and 60 at KSU) were explicitly given the reason. That is, they were informed that the completed envelopes were used in real, but we nonetheless wanted to observe what distributions they liked to choose after work. Alternatively, the remaining subjects (45 at KU and 40 at KSU) as the control group were not explicitly given the reason. As seen later, whether the purpose was explicitly given is not critical to select the preferred distributions in RET.

Finally, to determine the monetary reward between the student and each matched partner, a ball was drawn at random once at KU (multiple times at KSU).[11]

2.2 AW experiment

In BAW experiment, all 190 participants faced the allocation problems in RET after non-RET, meaning that we could not omit the learning effect of non-RET on the decisions in RET. Therefore, to exclude the learning effects, AW experiment, which was conducted nine months after BAW experiment, was implemented for the newly recruited 155 students in KSU. In AW experiment, the subjects initially conducted the envelope task which was exactly the same as that in BAW experiment, and then were given the allocation problems in Table 1(b). Because AW experiment did not in-

[11]By giving a simple question, we confirmed that all subjects except for one person understood the procedure of determining the monetary reward where we added further explanation to the person. Please see Appendix A.

clude non-RET, they did not have any background knowledge for the choice problems, implying that their answers in RET did not include any leaning effects. Since we confirmed that the repetition of allocation problems did not affect the subsequent choices in BAW experiment, we repeated the allocation problems two times to collect richer data, that is, a total data of 306.[12] Furthermore, as in BAW experiment, about 60 percent, 92 persons were informed of the reason why the subjects had to determine the monetary rewards of the anonymous partner; the rest 63 persons were not told about it.

After completing the choices in RET and before picking up a ball to determine the final monetary reward, all the participants were given a questionnaire to complete. First, the subjects were asked to answer the degree of fatigue from the envelope work (1=not tired,...,7=extremely tired) and their opinion of their own unit reward given them for completing the envelope (1=extremely cheap,...,7=extremely expensive). Next, because the role of emotions in decision making is important in RET as shown in Bosman et al (2005), we asked the subjects to write a simple comment freely with respect to the equal distribution, a possible case where the reward of anonymous partner was the equal to that of decision maker (i.e., (self, partner)=(SE,SE) in Table 1(b)). By answering the Big-five tests, the subjects were asked to determine personal characters: extraversion, agreeableness, conscientiousness, emotional stability and intellect. Finally, the rewards of the participants were determined under the random selection as in BAW experiment.

[12]Because two subjects did not answer completely, we omitted total four data (2 subjects $\times$ 2 trials).

3 Experimental results: the egalitarianism

First, each number of total data in BAW experiment was 190 in non-RET and 390 in RET.[13] Instead, the number of total data in AW experiment was 306. In addition, the unit reward per the completed envelope was 50, 100 or 200 yen, and the working time was 5, 10 or 20 minutes.

Table 3 shows a summary of the working time and unit reward between the subject and the matched anonymous partner where 'WTD (working time difference)= the working time of decision maker minus that of the partner' and 'URD (unit reward difference) = the unit reward of decision maker minus that of the partner'.[14] For instance, in the case (WTD, UPD)=(positive, zero), we show that the decision maker worked longer than the anonymous matched partner and their unit rewards were the same. In almost all cases, we carefully omitted a more complicated situation that both the working time and the unit reward were different between the decision maker and the matched partner. That is, we supposed that at least either WTD or URD was zero.

An exception is the case where the decision maker worked but the matched partner did not work in AW experiment, that is, the decision maker had the greater unit reward and the longer working time, corresponding to (WTD, UPD)=(positive, positive). This case would be interesting from the following reasons. First, this case that the decision maker worked but the

[13]Since the anonymous partners in RET of KSU were switched three times, total data 390 in RET was composed of 90 data at KU and 100 subjects $\times$ 3 trials at KSU.

[14]Concretely, we can show (minimum, maximum, mean, standard deviation)=$(-15, 15, -0.12, 7.35)$ in WTD of BAW and $(-100, 100, 0, 57.8)$ in URD of BAW; instead, $(-10, 20, 3.58, 9.40)$ in WTD of AW and $(-50, 100, 11.61, 40.35)$ in URD of AW.

matched partner did not work would be a simple comparative application from the case that both the decision maker and the anonymous partner do not work in the existing papers (Barnet et al. 2009, Fehr et al. 2008 and 2013). Second, although the subjects were not informed of the achievement of the matched partners, they understood the partners did not complete any envelope with no efforts. As a result, if the subjects wanted unequal distribution to care about only themselves (or both themselves and their matched partners), the ratio of egoism (or behindness aversion) is large in this case, as argued in Section 1.2.

Table 4 gives a summary of the preference types. Although a set of four questions in RET of BAW experiment at KSU was repeated three times, we put data together as shown in RET (Total) of BAW (KSU) at Table 4. This is because the repetition itself did not affect the choices of the subjects strongly in ANOVA.[15]

From Table 4, we obtain the findings about the role of giving the opportunity to work for the egalitarian. From the lines of non-RET in BAW (KU) and (KSU), we can see that nearly half of the participants selected the equal distribution for all four questions in non-RET (41 percent at KU and 48 percent at KSU), showing in non-RET, the ratio of egalitarian is the largest among the possible types of other-regarding preferences as in the existing findings.[16] Alternatively, and surprisingly, in RET of BAW (KU)

[15]For example, the data of egalitarian was composed of 22, 18 and 23 according to the three trials of allocation problems, showing ANOVA accepts the null hypothesis that the egalitarian type derived from the order of match stemmed from the same distribution (F =0.84, p =0.43). With respect to the remaining types of preferences (i.e., Aheadness averse, Behindness averse, Welfare, Egoism and Other), we obtained similar results.

[16]Using the same choice problems in Bartling et al (2009), 63 percent of participants is egalitarian,

and (KSU), the ratios of egalitarian dramatically falls to 11 percent at KU and 21 percent at KSU. The difference of ratio of egalitarian between non-RET and RET is significantly different from zero by Welch's $t-$test (with a two-tailed $p = 0.00$ and t=4.87 under non-RET at BAW (KU) vs RET at BAW (KU); $p = 0.00$ and t=4.87 under non-RET at BAW (KSU) vs RET at BAW (KSU)).

Because RET at BAW experiment might include the learning effect from non-RET, it would be useful to replace the data of RET at BAW experiment with that of RET at AW experiment. When Welch's $t-$test is again implemented, we find that the ratio of egalitarian in RET of AW experiment is extremely low relative to that in non-RET of BAW experiments at KU or KSU, statistically significant differences (with a two-tailed p =0.00 and t =5.34 under non-RET at BAW (KU) vs RET at AW (KSU); p =0.00 and t =6.81 under non-RET at BAW (KSU) vs RET at AW (KSU)).

Result 1: *The ratio of egalitarian in RET is low relative to that in non-RET.*

Figure 1 shows the gender differences with respect to the ratio of egalitarian. In all cases, we can see that the ratio of egalitarian by females is greater than that by males, especially notice that this result was held irrespective of non-RET and RET. Concretely, the differences of ratio by gender in non-RET are statistically significant by Welch's $t-$test (with a two-tailed p =0.01 and t = 2.70 under females vs males at non-RET of BAW (KU); p =0.03 and t = 2.23 under females vs males at non-RET of BAW (KSU)). In addition, the gender differences of the ratio of egalitarian

which is somewhat larger than our result.

in RET of KSU are also statistically significant (with a two-tailed $p = 0.02$ and $t = 2.31$ under females vs males at RET of BAW (KSU); $p = 0.00$ and $t = 2.85$ under females vs males at RET of AW (KSU)).

Result 2: *Regardless of RET and non-RET, the ratio of egalitarian by females tends to be greater than by males.*

As argued in the above, it is interesting to turn our concerns to the last horizontal line named by RET (no work) of Table 4, indicating to the result in the case where the decision maker worked but the anonymous partner did not work. Then, the ratio of egalitarian in this case is extremely low relative to that in non-RET from each university, strongly statistical difference by Welch's $t-$test (with a two-tailed $p = 0.00$ and t=5.37 under non-RET at BAW (KU) vs RET (no work); p =0.00 and t =6.63 in non-RET at BAW (KSU) vs RET (no work)). This result supports Result 1, and strictly speaking, giving the *decision maker* the opportunity to work is important to confirm Result 1.[17]

Result 3: *Giving the opportunity to work makes people more un-egalitarian.*

When focusing on the case where the decision maker worked and the matched partner did not work, we are now interested in confirming that the decrease in the ratio of egalitarian increases which types of preferences. Concretely, if the subjects wanted only their own rewards to reflect their achievement, the ratio of egoism increases; instead, if they care about not only themselves but also their matched partners, the ratio of behindness

[17]One may consider the case where the decision maker does not work but the matched partner works. This case may be interesting to examine the human behavior; however, such a situation would not be seen in the real society.

aversion increases. From the columns of 'Behindness' and 'Egoism' in the line of RET (no work) of Table 4, we can see high ratios of behindness aversion (30 percent) as well as the egoism (26 percent), showing that nearly 60 percent of subjects was assigned and very high relative to those in the other lines of RET. Moreover, the ratios of behindness aversion and egoism are almost the same, that is, the ratio of egoistical preference was almost the same as that of behindness averse preference.

Furthermore, from Table 5 which arranges impressions under the assumption that the matched partner could get the reward which the decision maker earned in RET, we confirm the subjects who matched the unworked partner brought about the dissatisfaction for the equal distributions as predicted. In detail, 53 percent of the subjects (28 over 53) who matched the unworked partner wrote 'I am dissatisfied with the equal distribution' as shown in the underlined parts of Table 5.

Table 6 and 7 show summary tables in RET. Based on the elicited preferences in non-RET, Table 6 arranges the data on the preferences' types in RET. First, looking at 'SUM1' of 'Egalitarianism' at Table 6 as well as 'Egalitarianism' at Table 7, which are given in the underlined bold type, it seems that the relative working conditions did not strongly affect the selection of egalitarian in RET because the underlined round bracket is composed of various cases of the relative working conditions.[18]

Result 4: *The relative conditions of work itself do not strongly affect the selection of egalitarian distributions in RET.*

Next, we understand that the results in RET of BAW experiment would

[18]In next section, Result 4 will be supported from the regression analysis.

be affected by those in non-RET, so if the learning effects strongly exist, the distributions of other-regarding preferences in RET of BAW experiment would be highly different from those in RET of AW experiment. However, from 'SUM1' of Table 6 and Table 7 we can see that these distributions would be similar. For example, the highest ratios among the other-regarding preferences' types in each RET of BAW/AW experiments are not egalitarian, but aheadness averse, 38 percent of total data (147 over 390) in BAW experiment and 33 percent (101 over 306) in AW experiment. The ratios of behindness aversion in each experiment are similar to those of egoism, which are lower than those of welfare-maximizing types.[19] Hereafter, we assume that the learning effects at BAW experiments were limited.

Based on the assumption, we find the following two points. Moving across the horizontal line of 'Egalitarianism' in RET of Table 6, we can see that almost all egalitarians in RET were egalitarians in non-RET, which surprisingly indicates over 90 percent (i.e., 66 over 73). In other words, almost all egalitarian in RET did not prefer to unequal distribution in non-RET.[20]

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[19] Alternatively, the ratios of egalitarians in each RET would be different to some extent, 19 percent (73 over 390) in BAW experiment and 12 percent (36 over 306) in AW experiment; however, 2-sample test for equality of proportions in STATA accepts the null hypothesis at the 10 percent significant level.

[20] This finding might be affected by the learning effect in non-RET; however, if the strong learning effect exists, we could see the similar trend for not only the egalitarian but also the rest preferences. Moving across the lines of each preference in RET of Table 6, we can certainly confirm large ratios that the preference types in RET were the same with those in non-RET; however, it is extremely low relative to the type of egalitarian. For instance, approximately 50 percent of 147 aheadness averse persons in RET were the same types in non-RET, which is the second highest ratio next to the egalitarian but extremely low relative to the egalitarian (over 90 percent).

Notice the opposite trend, where the almost all egalitarians in non-RET are the egalitarians in RET, does not hold true. Looking down the vertical line of 'Egalitarianism' in non-RET of Table 6, only 36 percent (66 over 181) of egalitarian in non-RET were the same in RET, which was the second lowest next to the egoism. For example, approximately 70 percent of aheadness averse or the welfare-maximizing subjects in non-RET were the same type in RET, which was nearly double relative to the percentage of the case of egalitarian.

Result 5: *Almost all egalitarians in RET are the egalitarians in non-RET. Instead, more than half of the egalitarians in non-RET are not the egalitarians in RET.*

Finally, moving across the horizontal line of 'Egalitarianism', we find that the subjects who selected the unequal distribution in non-RET were not the egalitarian in RET. In particular, any subjects of the behindness averse and the welfare-maximizing types in non-RET were not the egalitarian in RET. This finding partly supports Result 3, that is, giving the opportunity to work does not make un-egalitarian in non-RET egalitarian in RET.

Result 6: *Almost subjects who selected unequal distributions in non-RET are not the egalitarian in RET.*

4 Regression analysis

Table 8 indicates the results of logit regression where the lines (1), (4), (7), (10) and (13) give the regression results in AW experiment and the

rest lines give those in BAW experiment. The dependent variables are each preference type in RET.

The variable *Envelopes (Num)* shows the number of completed envelopes.[21] The variable *Gender* shows male (=0) and female (=1). The variables *Fatigue* (1=not tired,...,7=extremely tired) and *Unit reward* (1=extremely cheap,..., 7=extremely expensive) reflect the degree of fatigue in the envelope work and the validity of own unit reward as explained in Section 2. The variables *Extraversion*, *Agreeableness*, *Conscientiousness*, *Emotional Stability* and *Intellect* represent the personalities elicited in Big-five tests.[22] The variable *Purpose* means a dummy variable that the reason why the subjects had to determine the monetary rewards of anonymous parter at the envelope work was explicitly given (=1) and not given (=0). The variable *Uni* shows KU(=0) and KSU (=1). The variable *Gain* is the monetary rewards obtained in non-RET of BAW experiment. Finally, the variables *Egalitarianism*, *Aheadness*, *Behindness*, *Welfare* and *Egoism* are the types of other-regarding preferences; (non-RET) means the preference types at non-RET.

4.1 Egalitarianism

Our findings in the column (1) and (2) are as follows. First, the effects of gender on the egalitarianism is statistically significant at the 5% significance level (Result 2); instead, the effects of *URD* and *WTD* on the egalitarianism are not confirmed (Result 4). Furthermore, because the subjective

[21] The mean number of completed envelopes is 3.4 and the standard deviation is 1.69. Furthermore, the increase in the time of working monotonically increases the number of completed envelopes.

[22] Please see Appendix B.

evaluation for the envelope work, represented by *Fatigue* and *Unit reward*, does not also influence the egalitarianism, the argument of Result 4 may be further accepted. The number of completed envelope, which represents the achievement of RET, does not affect the taste of egalitarian, corresponding to the argument in Almås et al (2010) that *(egalitarian) view is hard to explain by cognitive maturation.*

With respect to the personal characters, both the variable *Conscientiousness* and *Intellect* have significantly negative impacts on the egalitarianism. That is, people who think things carefully and broadly tend to select unequal distributions; however, considering that the working conditions *URD* and *WTD* and the subjective evaluation for the envelope work *Fatigue* and *Unit reward* do not have significant impacts, it is likely that they did not care about the working conditions seriously to select the equal distributions, but they are just intellectual and conscientious. In particular, with respect to *Intellect*, this opinion may be supported. We can confirm that the variable *Uni* (KSU=1 and KU=0) has the significantly positive effect in the column (2). That is, the subjects in KU are more non-egalitarian than those in KSU, which reflects the academic level of each university in Japan.[23] This finding means that whether the subjects are intellectual or not in the academic viewpoint is critical role for the selection of equal

[23]We notice that two universities are very similar except for the academic level, and the setting is also very similar in BAW experiment. Both universities are apart about five kilometer and very near, coeducational and have various academic departments. Moreover, the ratio of males and females between BAW (KU) and BAW (KSU) in our experiments was almost the same, the age of participants were around twenty, and the experiment was conducted in the same period. Instead, one of the noticeable differences is unquestionably the academic level, that is, KU is a top national university in Kyushu island, and one of top universities in Japan; KSU is a private university in Kyushu island, not over the standard-academic level of the university education in Japan.

distributions.

Result 8: *The subjects who are more intellectual and more conscientiousness are non-egalitarian in RET.*

Finally, we can confirm the negatively significant impact of *Gain* on the egalitarianism in the column (2); however, *Gain* in (3) does not have any impact on the egalitarianism, alternatively, *Egalitarianism (non-RET)* positively impacts on the egalitarianism at the 1% significance level. In addition, notice that pseudo R-square is 0.22 in (3) higher than 0.09 in (2). Based on these findings, we may argue that the important element to select the egalitarianism in RET is not the amount of monetary rewards in non-RET but the preference types in non-RET where we notice that *Gain* indicates not only the monetary rewards in non-RET but also reveals the other-regarding preference types in non-RET to some extent.

4.2 The other-regarding preferences except for the egalitarianism

With respect to the other-regarding preferences except for the egalitarianism, our interests are composed of three points. First, from the columns (4)–(6), *WTD* has the negative impact on *Aheadness*, implying that the subjects who worked shorter time relative to the matched partner tended to select the distributions of aheadness aversion. This is because the subjects who worked in a short time could not complete many envelopes so their reward would be smaller, thereby presuming they wanted the greater amount of monetary rewards of the matched partner. For instance, some subjects who worked shorter wrote the impression 'My partner is pity' for

the equal distributions in Table 5.

Next, turning our interests to the effects of achievement in RET shown in *Envelopes (Num)*, we find that *Envelopes (Num)* significantly affect *Behindness* and *Welfare*.[24] Concretely, as the subjects completed more envelopes, they preferred the unequal distribution of the behindness aversion but avoided the welfare-maximizing distribution. That is, the subjects who completed more envelopes did not like the more of pie to themselves and disliked the maximizing distribution of both pies.[25]

We now confirm the impacts of *Gain* as well as the other-regarding preferences in non-RET on each preference type in RET. From the columns (5), (6), (8) and (9) we can argue that the subjects tended to select the same other-regarding preferences in the case of aheadness and behindness averse.[26] In the cases of Welfare and Egoism, we can see that the welfare-maximizing or the egoistical distribution in RET are significantly affected by *Gain* but not by *Welfare (non-RET)* and *Egoism (non-RET)* at 5 percent significant levels. Therefore, we may argue that the subjects who pursue own monetary rewards or aggregate ones tended to select the unequal distributions of welfare maximization and egoism.

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[24]Because *Envelopes (Num)* in AW experiment has more dispersion than in BAW experiment, we omitted the data of upper and lower bounds of *Envelopes (Num)*; however, this significant effect still remained.

[25]Following Erkal et al (2011), this result may not be seen if subjects are informed of the existence of choice problems *before* exerting their effort; however, because our main purpose is to examine the egalitarianism, further analysis is beyond the current interest.

[26]With respect to the behindness aversion, notice that *Aheadness (non-RET)* has the negative sign in (9), implying that the subjects who do not want to be superior to the partners in wealth in non-RET (i.e., behindness averse) tend to select the behindness averse distributions in RET.

5 Concluding remarks

We present results from non-RET and RET investigating the egalitarianism. Our main finding is that giving the opportunity to work itself makes people un-egalitarian. As we know, the merit of laboratory experiment is that, in principle, the experimental method provides *ceteris paribus* observations of individual economic agents, which are otherwise difficult to obtain like the egalitarianism. As a result, our set-up of laboratory experiment gives us a better sight of egalitarianism. Alternatively, we need to be careful for whether our finding is consistent in the field experiment. People would not encounter the opportunities to determine the money of others such as the salary at large. Needless to say, because our subjects are university students, they would not face such opportunities in their lives. However, even if the field experiment could be designed, the reduction in the egalitarianism in RET would intuitively arise under our society with scarcity.

We consider that the results in our experiment would lead to some important implications in this field. First, our findings can help us to understand why quite a few people are opposed to the redistribution policies to be more equal society. Following our results, the cause is to give the opportunities to work to people itself, rather than the relative working conditions, the visible achievement and the fatigue, which implies that it is difficult for a lot of people to approve of the redistribution policies. Second, it may be important to re-confirm the development of egalitarianism under RET because a lot of children all over the world still work, implying that the development of other-regarding preferences may differ between the developed

and undeveloped countries because of child labor.

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Figure 1: The ratio of egalitarianism where RET 1 (RET 2) shows RET at BAW experiment (AW experiment)

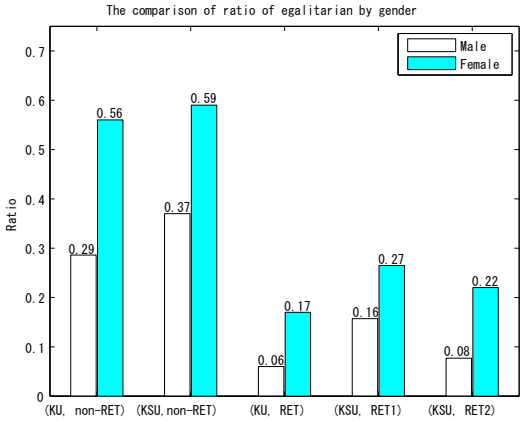

Table 1–Distribution tasks (YEN)

(a) non-RET	Distribution A self: partner	Distribution B self: partner	(b) RET	Distribution A self: partner	Distribution B self: partner
prosocial	500: 500	500: 300	prosocial	SE: SE	SE: SE-200
costly prosocial	500: 500	800: 300	costly prosocial	SE: SE	SE+300: SE-200
envy	500: 500	500: 800	envy	SE: SE	SE: SE+300
costly envy	500: 500	600: 1000	costly envy	SE: SE	SE+100: SE+500

Note: All payments were made in YEN (1 dollar is around 100 yen). SE is self-earn in the envelope work.

Table 2: Definition of other-regarding preference types

Type	pro-sociality	Costly pro-sociality	Envy	Costly envy
Egalitarian	equal	equal	equal	equal
Aheadness averse	equal	equal	(unequal at least one)	
Behindness averse	(unequal at least one)		equal	equal
Welfare	equal	unequal	unequal	unequal
Egoism		unequal		unequal

Note: First, the aheadness averse and the behindness averse types do not include the equalitarian type. Second, the set of Egoism type does not include that of Welfare type. That is, the egoism type selected (pro-sociality, costly pro-sociality, envy, costly envy)=(equal, unequal, equal, unequal), (unequal, unequal, equal, unequal) or (unequal, unequal, unequal, unequal). Finally, the rest type is called as other in this paper.

Table 3: A summary in RET

		UPD		
		zero	positive	negative
WTD	zero	(130, 53)	(65, 49)	(65, 53)
	positive	(65, 47)	(0, 53)	
	negative	(65, 46)		

Note: The round brackets shows the number of data in BAW experiment (left) and that in AW experiment (right). Furthermore, WTD (UPD) is the difference of working time (unit reward) between the decision pro-social and the matched partner.

Table 4: A summary at BAW and AW experiments

Experiment		Egalitarianism	Aheadness	Behindness	Welfare	Egoism	Other	SUM
BAW (KU)	non-RET	37 (0.41)	25 (0.28)	1 (0.01)	24 (0.27)	3 (0.03)	0 (0)	90 (1)
	RET	10 (0.11)	25 (0.28)	13 (0.14)	27 (0.3)	14 (0.16)	1 (0.01)	90 (1)
BAW(KSU)	non-RET	48 (0.48)	27 (0.27)	8 (0.08)	7 (0.07)	6 (0.06)	4 (0.04)	100 (1)
	RET (Total)	63 (0.21)	122 (0.41)	30 (0.1)	50 (0.17)	28 (0.09)	7 (0.02)	300 (1)
AW(KSU)	RET (Total)	36 (0.12)	102 (0.33)	41 (0.13)	74 (0.24)	45 (0.15)	8 (0.03)	306 (1)
	RET (no work)	4 (0.08)	11 (0.21)	16 (0.30)	8 (0.15)	14 (0.26)	0 (0)	53 (1)

Note: The number in the parentheses is the ratio of type in each experiment.

Table 5: The simple impression for the equal distribution

Type:	Egalitarianism	Aheadness	Behindness	Welfare	Egoism	Other
I am not interested in others.	9	23	2	5	8	2
	(3, 2, 2, 0, 1, 1)	(4, 3, 6, 6, 4, 0)	(0, 0, 0, 1, 0, 1)	(0, 3, 1, 0, 1, 0)	(1, 0, 1, 3, 2, 1)	(1, 0, 0, 0, 1, 0)
I accept the equal distribution.	7	24	4	11	9	1
	(1, 0, 1, 0, 4, 1)	(6, 3, 0, 3, 8, 4)	(2, 1, 0, 0, 0, 1)	(4, 1, 2, 1, 2, 1)	(5, 0, 1, 0, 0, 3)	(0, 0, 1, 0, 0, 0)
I think that my partner is lucky (or unlucky).	1	9	6	6	3	0
	(0, 0, 0, 0, 1, 0)	(0, 0, 3, 3, 3, 0)	(0, 0, 2, 0, 1, 3)	(1, 0, 3, 0, 0, 2)	(1, 0, 0, 0, 1, 1)	(0, 0, 0, 0, 0, 0)
Please forgive me because your gain would decrease.	3	10	2	12	3	0
	(1, 2, 0, 0, 0, 0)	(5, 2, 1, 2, 0, 0)	(0, 0, 1, 1, 0, 0)	(6, 2, 0, 3, 0, 1)	(1, 1, 0, 1, 0, 0)	(0, 0, 0, 0, 0, 0)
I am dissatisfied with the equal distribution.	6	7	18	7	8	2
	(2, 0, 1, 0, 1, 2)	(1, 0, 0, 0, 0, 6)	(0, 1, 3, 0, 4, 10)	(0, 0, 2, 0, 2, 3)	(0, 0, 1, 0, 0, 7)	(0, 0, 1, 1, 0, 0)
My partner is pity.	0	5	1	13	2	0
	(0, 0, 0, 0, 0, 0)	(0, 4, 0, 0, 1, 0)	(1, 0, 0, 0, 0, 0)	(2, 5, 1, 4, 1, 0)	(0, 0, 0, 2, 0, 0)	(0, 0, 0, 0, 0, 0)
My impression depends on your gain.	0	4	0	3	4	1
	(0, 0, 0, 0, 0, 0)	(3, 0, 1, 0, 0, 0)	(0, 0, 0, 0, 0, 0)	(1, 0, 1, 1, 0, 0)	(2, 1, 1, 0, 0, 0)	(0, 0, 0, 0, 1, 0)
Others	10	19	8	17	8	3
	(0, 2, 3, 4, 1, 0)	(2, 6, 3, 5, 2, 1)	(2, 0, 0, 2, 3, 1)	(0, 6, 2, 7, 1, 1)	(0, 0, 2, 2, 2, 2)	(1, 1, 0, 1, 0, 0)
SUM	36	102	41	74	45	12

The numbers in the parentheses show the cases that (WTD, UPD)=(0, 0), (0, negative), (0, positive), (negative, 0), (positive, 0) and (positive, positive) from left to right.

Table 6: A summary of preference types at BAW experiment

non-RET	Egalitarianism	Aheadness	Behindness	Welfare	Egoism	Other	
RET							SUM1
Egalitarianism	66	4	0	0	1	2	73
	(27, 6, 11, 9, 13)	(2, 1, 0, 1, 0)	(0, 0, 0, 0, 0)	(0, 0, 0, 0, 0)	(0, 0, 0, 1, 0)	(1, 0, 0, 1, 0)	(30, 7, 11, 12, 13)
Aheadness	59	73	3	5	5	2	147
	(17, 15, 7, 11, 9)	(22, 17, 9, 13, 12)	(0, 0, 1, 1, 1)	(2, 1, 0, 0, 2)	(2, 2, 1, 0, 0)	(0, 0, 2, 0, 0)	(43, 35, 20, 25, 24)
Behindness	27	1	8	2	1	4	43
	(11, 1, 7, 6, 2)	(0, 0, 1, 0, 0)	(3, 1, 1, 2, 1)	(1, 0, 1, 0, 0)	(1, 0, 0, 0, 0)	(2, 0, 2, 0, 0)	(18, 2, 12, 8, 3)
Welfare	13	18	6	31	7	2	77
	(3, 4, 2, 0, 4)	(6, 2, 3, 2, 5)	(1, 1, 1, 1, 2)	(9, 8, 5, 4, 5)	(5, 0, 1, 1, 0)	(0, 0, 0, 2, 0)	(24, 15, 12, 10, 16)
Egoism	15	8	5	6	7	1	42
	(4, 1, 6, 1, 3)	(0, 1, 2, 3, 2)	(2, 3, 0, 0, 0)	(3, 0, 1, 1, 1)	(0, 1, 1, 4, 1)	(0, 0, 0, 0, 1)	(9, 6, 10, 9, 8)
Other	1	2	3	1	0	1	8
	(1, 0, 0, 0, 0)	(1, 0, 0, 0, 1)	(2, 0, 0, 1, 0)	(1, 0, 0, 0, 0)	(0, 0, 0, 0, 0)	(1, 0, 0, 0, 0)	(6, 0, 0, 1, 1)
SUM2	181	106	25	45	21	12	390
	(63, 27, 33, 27, 31)	(31, 21, 15, 19, 20)	(8, 5, 3, 5, 4)	(16, 9, 7, 5, 8)	(8, 3, 3, 6, 1)	(4, 0, 4, 3, 1)	(130, 65, 65, 65, 65)

The numbers in the parentheses show the cases that (WTD, UPD)=(0, 0), (0, negative), (0, positive), (negative, 0) and (positive, 0) from left to right. Note that there were no subjects who matched the unworked partner in Table 6, and thus we omitted the case.

Table 7: A summary of AW experiment where the partner works

AW	Egalitarianism	Aheadness	Behindness	Welfare	Egoism	Other	SUM
Obs.	36	101	41	74	45	9	306
	(7, 6, 7, 4, 8, 4)	(21, 18, 14, 19, 18, 11)	(5, 2, 6, 4, 8, 16)	(14, 17, 12, 16, 7, 8)	(10, 2, 6, 8, 5, 14)	(2, 1, 2, 2, 2, 0)	(59, 46, 47, 53, 48, 53)

The numbers in the parentheses show the cases that (WTD, UPD)=(0, 0), (0, negative), (0, positive), (negative, 0), (positive, 0) and (positive, positive) from left to right.

Table 8: The results of logit regression

	Egalitarianism			Aheadness			Behindness			Welfare			Egoism		
Experiment	AW	BAW		AW	BAW		AW	BAW		AW	BAW		AW	BAW	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Envelops	0.02	0.07	0.04	0.07	−0.09	−0.10	0.47***	0.43***	0.39***	−0.43***	−0.33***	−0.32**	0.08	0.15	0.19
(Num)	(0.16)	(0.73)	(0.39)	(0.76)	(−1.08)	(−1.07)	(3.36)	(3.45)	(2.90)	(−3.60)	(−3.00)	(−2.52)	(0.65)	(1.23)	(1.42)
Sex	0.98**	0.58**	0.23	−0.72**	−0.15	0.02	0.52	−0.17	−0.28	−0.23	−0.22	−0.01	0.38	−0.01	−0.12
	(2.33)	(2.12)	(0.76)	(−2.23)	(−0.68)	(0.08)	(1.21)	(−0.50)	(−0.73)	(−0.65)	(−0.82)	(−0.05)	(0.97)	(−0.02)	(−0.33)
URD	−0.02	0.06	−0.00	−0.20	−0.08	−0.09	1.03	−0.37	−0.41	−0.45	0.34	0.35	−0.17	−0.01	0.06
	(−0.03)	(0.23)	(−0.00)	(−0.48)	(−0.42)	(−0.46)	(1.60)	(−1.22)	(−1.30)	(−1.01)	(1.46)	(1.34)	(−0.31)	(−0.03)	(0.22)
WTD	−0.03	0.01	0.01	−0.03**	−0.04**	−0.04**	0.04*	0.02	0.03	−0.02	0.03	0.03	0.05**	0.02	0.02
	(−1.11)	(0.48)	(0.59)	(−1.90)	(−2.17)	(−2.02)	(1.68)	(0.86)	(0.96)	(−0.84)	(1.45)	(1.04)	(2.36)	(0.76)	(0.66)
Fatigue	−0.05			−0.00			0.00			−0.05			0.06		
	(−0.37)			(−0.02)			(0.03)			(−0.59)			(0.56)		
Unit price	−0.01			0.20			−0.03			−0.03			−0.24		
	(−0.05)			(1.57)			(−0.19)			(−0.24)			(−1.53)		
Extraversion	0.04			−0.03**			−0.05*			0.01			0.05*		
	(1.42)			(−1.82)			(−1.86)			(0.65)			(1.86)		
Agreeableness	0.01			0.04			0.02			−0.03			−0.05		
	(0.15)			(1.45)			(0.42)			(−0.89)			(−1.22)		
Conscientiousness	−0.13***			0.00			0.04			0.04			0.01		
	(−2.99)			(0.12)			(1.03)			(1.20)			(0.16)		
Emotional	0.00			−0.04**			0.03			0.01			0.03		
Stability	(0.07)			(−2.18)			(1.14)			(0.32)			(1.27)		
Intellect	−0.16***			−0.03			0.08*			0.06*			0.01		
	(−3.24)			(−0.90)			(1.91)			(1.84)			(0.23)		
Purpose	−0.13	0.37	0.28	0.20	−0.34	−0.36	−0.27	0.67*	0.41	0.04	−0.39	−0.34	−0.16	−0.01	0.04
(1=yes)	(−0.27)	(1.28)	(0.90)	(0.67)	(−1.49)	(−1.40)	(−0.59)	(1.80)	(1.03)	(0.13)	(−1.36)	(−1.05)	(−0.42)	(−0.04)	(0.10)
Uni		0.91**	0.81*		0.58**	0.61*		0.09	−0.48		−1.29***	−0.67*		−0.49	−0.51
		(2.32)	(1.89)		(1.99)	(1.82)		(0.22)	(−1.05)		(−3.90)	(−1.68)		(−1.25)	(−1.18)
Gain		−1.01***	0.14		−0.26*	−0.15		0.22	0.29		0.39***	−0.16		0.46***	0.21
		(−3.06)	(0.39)		(−1.94)	(−0.76)		(1.12)	(1.15)		(2.71)	(−0.90)		(2.67)	(0.97)
Egalitarianism			2.78***			0.60			−0.19			−1.69*			0.43
(non-RET)			(3.55)			(0.71)			(−0.24)			(−1.85)			(0.38)
Aheadness			0.12			2.21***			−3.30***			−0.69			0.23
(non-RET)			(0.14)			(2.64)			(−2.68)			(−0.79)			(0.20)
Behindness			(omitted)			−0.70			0.86			−0.04			1.39
(non-RET)						(−0.68)			(1.01)			(−0.04)			(1.17)
Welfare			(omitted)			−0.58			−1.98*			1.70*			0.64
(non-RET)						(−0.60)			(−1.86)			(1.88)			(0.53)
Egoism			0.07			0.26			−1.72			0.53			2.03*
(non-RET)			(0.06)			(0.27)			(−1.37)			(0.55)			(1.70)
cons	1.72	2.31	−5.15**	−0.12	1.00	−0.53	−7.59***	−5.40***	−4.35**	−0.32	−1.19	1.67	−2.68	−4.86***	−4.16**
	(0.80)	(1.27)	(−2.13)	(−0.09)	(1.15)	(−0.34)	(−3.88)	(−3.95)	(−2.19)	(−0.23)	(−1.26)	(1.06)	(−1.61)	(−3.97)	(−2.19)
R-square	0.13	0.09	0.21	0.06	0.05	0.18	0.17	0.10	0.23	0.10	0.07	0.23	0.06	0.05	0.08