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**Working Paper**

## State or nature? Formal vs. informal sanctioning in the voluntary provision of public goods

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**Appendix to Kamei, Putterman and Tyran, 2011**  
**“State or Nature? Formal vs. Informal Sanctioning**  
**in the Voluntary Provision of Public Goods”**

**Overview**

Appendix A: Instructions

Appendix B: Additional Tables and Figures

**Appendix A: Instructions**

**A.1. Main Part of Experiments**

**(a) BASELINE treatment**

At the beginning of the session, the experimenter said to all subjects present: “Today you will take part in one main experiment and two shorter tasks, and we expect the whole thing to take less than two hours. The main experiment is divided into six phases of four periods each. So, in total, there are 24 periods. We will now read the instructions for the main part of today’s experiment.” Then the experimenter began to read aloud the following instructions, of which the subjects also had printed copies:

**Welcome**

You are now taking part in a decision-making experiment. Depending on your decisions and the decisions of other participants, you will be able to earn money in addition to the \$5 guaranteed for your participation. Please read the following instructions carefully.

During the experiment you are not allowed to communicate with other participants. If you have a question, raise your hand. One of us will come to answer your question.

During the experiment your earnings will be calculated in points. At the end of the experiment, points will be converted to U.S. dollars at the following rate:

**34 points = \$1**

This means each point will exchange for just under 3 cents of real money. At the end of the experiment your total earnings (including the \$5 participation fee) will be paid out to you in cash.

The experiment has six phases each consisting of 4 periods (in total, 24 periods).

# Instructions

In the experiment, each participant is randomly assigned to a **group of 5**. This means that you are in a group with four other participants. **You will be part of the same group throughout the entire experiment.** Nobody knows which other participants are in their group, and nobody will be informed who was in which group after the experiment.

Phase 1 is divided into 4 periods. In each period, each group member, yourself included, will be given an **endowment of 20 points**. In each period you will have to make one decision.

## *Your decision*

You and the four others in your group simultaneously decide how to use the endowment. There are two possibilities:

1. **You can allocate points to a group account.**
2. **You can allocate points to a private account.**

You will be asked to indicate the number of points you want to allocate to the group account. Only integers between 0 and 20 are allowed for this purpose. The remaining points will automatically be allocated to your private account. Your earnings depend on the total number of points in the group account, and the number of points in your private account.

## *How to calculate your earnings*

Your earnings from your private account are equal to the number of points you allocate to it. That is, **for each point you allocate to your private account you get 1 point as earnings**. For example, your earnings from the private account equal 3 points if you allocate 3 points to it. The points you allocate to your private account do not affect the earnings of the others in your group.

Your earnings from the group account equal the **sum** of points allocated to the group account by all 5 group members multiplied by 0.4. **For each point you allocate to the group account you and all others in your group each get 0.4 points as earnings**. For example, if the sum of points in the group account is 30, then your earnings from the group account and the earnings of each of the others in your group from the group account are equal to 12 points.

Your earnings can be calculated with the following formula:

$$20 - (\text{points you allocated to the group account}) + 0.4 * (\text{sum of points allocated by all group members to the group account})$$

Note that you get 1 point as earnings for each point you allocate to your private account. If you instead allocate 1 extra point to the group account, your earnings from the group account increase by  $0.4 * 1 = 0.4$  points and your earnings from your private account decrease by 1 point. However, by allocating 1 extra point to the group account, the earnings of each of the other 4 group members also increase by 0.4 points. Therefore, the total group earnings increase by  $0.4 * 5 = 2$  points.

5 = 2 points. Note that you also obtain earnings from points allocated to the group account by others. You obtain  $0.4 * 1 = 0.4$  points for each point allocated to the group account by another member.

### Example

Suppose you allocate 15 points to the group account, the second and third members of your group each allocate 20 points to the group account, and the remaining two individuals allocate 0 points each. In this case, the sum of points in the group account is  $15 + 20 + 20 + 0 + 0 = 55$  points. Each group member gets earnings of  $0.4 * 55 = 22$  points from the group account. Your total earnings are:  $20 - 15 + (0.4 * 55) = 5 + 22 = 27$  points.

The second and third members' earnings are:  $20 - 20 + (0.4 * 55) = 0 + 22 = 22$  points.

The fourth and fifth members' earnings are:  $20 - 0 + (0.4 * 55) = 20 + 22 = 42$  points.

### An additional decision

There is an additional decision for you to make in this part of the experiment that may also impact your earnings. At the start of the experiment, you will be asked to enter numbers into a form of the kind shown below, by which you will indicate how many of 20 points you want to allocate to the group account assuming that the others in your group, on average, allocate the amount shown. For example, in the top box, you'll enter the number of points you want to allocate if the others all allocate 0 to the group account; in the middle box, the number of points you want to allocate if the others allocate an average of 10; and in the last box, the number you want to allocate if they allocate an average of 20. The completed form is called a "conditional allocation schedule." In this schedule as well, you can only enter integers between 0 and 20.

Period
1 out of 24
Remaining time [sec]: 118

**Please begin by filling in your conditional allocation schedule**

If others on average choose 0, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 1, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 2, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 3, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 4, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 5, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 6, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 7, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 8, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 9, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 10, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 11, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 12, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 13, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 14, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 15, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 16, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 17, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 18, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 19, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 20, I choose	<input style="width: 50px;" type="text"/>

The choices you will enter in it will affect your earnings in the following way: after you and the others in your group fill in this decision form, you will be asked to make the first of the four allocation decisions in the manner described in the first part of these instructions. This first set of decisions will determine your earnings and those of the others in your group in the first period in the way already described. The first set of decisions will also influence your earnings in a second way: there will be an extra allocation period between period 1 and period 2 in which the payment is determined by one randomly selected group member's conditional allocation schedule and the other four individuals' ordinary first-period allocations.

For example, suppose that you allocate 5 to the group account in period 1 and that the others in your group allocate 0, 10, 15, and 20, respectively. Also suppose that you are the group member who is randomly selected as the one whose conditional allocation schedule is used. Then, the average unconditional allocation decisions by the four others is 11 (rounded from 11.25). Suppose that your conditional allocation schedule says that if others allocate an average of 11, you will allocate 6. Then, your payment in the extra period is  $(20 - 6) + 0.4 \cdot (6 + 0 + 10 + 15 + 20) = 14 + 20.4 = 34.4$ . On the other hand, the others in your group earn  $(20 - 0) + 0.4 \cdot (0 + 6 + 10 + 15 + 20) = 20 + 20.4 = 40.4$ ,  $(20 - 10) + 20.4 = 30.4$ ,  $(20 - 15) + 20.4 = 25.4$  and  $(20 - 20) + 20.4 = 20.4$ , respectively. As you can see, the others' earnings in the extra period are determined by their first period decisions and by your conditional allocation schedule given their first period decisions. Note that each individual in the group has the same likelihood of being the one whose conditional allocation schedule is used. The extra period between periods 1 and 2 is the only period in the experiment in which earnings are affected by one of the schedules that you or another person in your group submits in this additional decision task.

The first phase will be followed by a 40 second break and then by five phases, each separated by a break of the same duration, and each having the same structure, except that the additional decision part is not repeated.

### *Comprehension questions*

Please answer following questions. Raise your hand if you need help. A member of the experiment team will come to help you and will check your answers when you are done.

**1.** Suppose all five individuals in your group allocate 0 points to the group account.

a) How much do you earn? \_\_\_\_\_

b) How much do the others each earn? \_\_\_\_\_

**2.** Suppose all five allocate 20 points to the group account.

a) How much do you earn? \_\_\_\_\_

b) How much do the others each earn? \_\_\_\_\_

3. Suppose the others in your group allocate 40 points in total to the group account.

a) How much do you earn if you allocate 0 points to the group account? \_\_\_\_\_

b) How much do you earn if you allocate 10 points to the group account? \_\_\_\_\_

c) How much do you earn if you allocate 20 points to the group account? \_\_\_\_\_

4. In how many periods of this experiment will conditional allocation schedules affect earnings? \_\_\_\_\_

[When the comprehension questions were reached, experimenter asked subjects to try to answer on their own and said members of the experiment team would come around to check that participants had correctly answered all questions, and that if any had any questions about the questions they should raise their hand and one of us would come to help them.]

### **(b) 3-Vote treatments**

At the beginning of the session, the experimenter said to all subjects present: “Today you will take part in one main experiment and two shorter tasks, and we expect the whole thing to take less than two and a half hours. The main experiment is divided into six phases of four periods each. So, in total, there are 24 periods. We will now read the instructions for the first four periods. Once phase 1 is over you will receive further instructions.” Then the experimenter began to read aloud the following instructions, of which the subjects also had printed copies:

## **Welcome**

You are now taking part in a decision-making experiment. Depending on your decisions and the decisions of other participants, you will be able to earn money in addition to the \$5 guaranteed for your participation. Please read the following instructions carefully.

During the experiment you are not allowed to communicate with other participants. If you have a question, raise your hand. One of us will come to answer your question.

During the experiment your earnings will be calculated in points. At the end of the experiment points will be converted to U.S. dollars at the following rate:

**34 points = \$1**

(This means each point will exchange for just under 3 cents of real money.) At the end of the experiment your total earnings (including the \$5 participation fee) will be paid out to you in cash.

The experiment has six phases each consisting of 4 periods (in total, 24 periods). The following instructions explain the details of phase 1. The details of the subsequent phases will be explained later.

## Instructions for Phase 1

In the experiment, each participant is randomly assigned to a **group of 5**. This means that you are in a group with four other participants. **You will be part of the same group throughout the entire experiment.** Nobody knows which other participants are in their group, and nobody will be informed who was in which group after the experiment.

Phase 1 is divided into 4 periods. In each period, each group member, yourself included, will be given an **endowment of 20 points**. In each period you will have to make one decision.

### *Your decision*

You and the four others in your group simultaneously decide how to use the endowment. There are two possibilities:

- 1. You can allocate points to a group account.**
- 2. You can allocate points to a private account.**

You will be asked to indicate the number of points you want to allocate to the group account. Only integers between 0 and 20 are allowed for this purpose. The remaining points will automatically be allocated to your private account. Your earnings depend on the total number of points in the group account, and the number of points in your private account.

### *How to calculate your earnings*

Your earnings from your private account are equal to the number of points you allocate to it. That is, **for each point you allocate to your private account you get 1 point as earnings**. For example, your earnings from the private account equal 3 points if you allocate 3 points to it. The points you allocate to your private account do not affect the earnings of the others in your group.

Your earnings from the group account equal the **sum** of points allocated to the group account by all 5 group members multiplied by 0.4. **For each point you allocate to the group account you and all others in your group each get 0.4 points as earnings**. For example, if the sum of points in the group account is 30, then your earnings from the group account and the earnings of each of the others in your group from the group account are equal to 12 points.

Your earnings can be calculated with the following formula:

$$20 - (\text{points you allocated to the group account}) + 0.4 * (\text{sum of points allocated by all group members to the group account})$$

Note that you get 1 point as earnings for each point you allocate to your private account. If you instead allocate 1 extra point to the group account, your earnings from the group account increase by  $0.4 * 1 = 0.4$  points and your earnings from your private account decrease by 1 point. However, by allocating 1 extra point to the group account, the earnings of each of the other 4 group members also increase by 0.4 points. Therefore, the total group earnings increase by  $0.4 * 5 = 2$  points. Note that you also obtain earnings from points allocated to the group account by others. You obtain  $0.4 * 1 = 0.4$  points for each point allocated to the group account by another member.

### *Example*

Suppose you allocate 15 points to the group account, the second and third members of your group each allocate 20 points to the group account, and the remaining two individuals allocate 0 points each. In this case, the sum of points in the group account is  $15 + 20 + 20 + 0 + 0 = 55$  points. Each group member gets earnings of  $0.4 * 55 = 22$  points from the group account. Your total earnings are:  $20 - 15 + (0.4 * 55) = 5 + 22 = 27$  points. The second and third members' earnings are:  $20 - 20 + (0.4 * 55) = 0 + 22 = 22$  points. The fourth and fifth members' earnings are:  $20 - 0 + (0.4 * 55) = 20 + 22 = 42$  points.

### *An additional decision*

There is an additional decision for you to make in this part of the experiment that may also impact your earnings. At the start of the experiment, you will be asked to enter numbers into a form of the kind shown below, by which you will indicate how many of 20 points you want to allocate to the group account assuming that the others in your group, on average, allocate the amount shown. For example, in the top box, you'll enter the number of points you want to allocate if the others all allocate 0 to the group account; in the middle box, the number of points you want to allocate if the others allocate an average of 10; and in the last box, the number you want to allocate if they allocate an average of 20. The completed form is called a "conditional allocation schedule." In this schedule as well, you can only enter integers between 0 and 20.



Period
1 out of 24
Remaining time [sec]: 118

**Please begin by filling in your conditional allocation schedule**

If others on average choose 0, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 1, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 2, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 3, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 4, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 5, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 6, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 7, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 8, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 9, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 10, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 11, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 12, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 13, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 14, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 15, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 16, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 17, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 18, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 19, I choose	<input style="width: 100%;" type="text"/>
If others on average choose 20, I choose	<input style="width: 100%;" type="text"/>

The choices you will enter in it will affect your earnings in the following way: after you and the others in your group fill in this decision form, you will be asked to make the first of the four allocation decisions in the manner described in the first part of these instructions. This first set of decisions will determine your earnings and those of the others in your group in the first period in the way already described. The first set of decisions will also influence your earnings in a second way: there will be an extra allocation period between period 1 and period 2 in which the payment is determined by one randomly selected group member's conditional allocation schedule and the other four individuals' ordinary first-period allocations.

For example, suppose that you allocate 5 to the group account in period 1 and that the others in your group allocate 0, 10, 15, and 20, respectively. Also suppose that you are the group member who is randomly selected as the one whose conditional allocation schedule is used. Then, the average unconditional allocation decisions by the four others is 11 (rounded from 11.25). Suppose that your conditional allocation schedule says that if others allocate an average of 11, you will allocate 6. Then, your payment in the extra period is  $(20 - 6) + 0.4 \cdot (6 + 0 + 10 + 15 + 20) = 14 + 20.4 = 34.4$ . On the other hand, the others in your group earn  $(20 - 0) + 0.4 \cdot (0 + 6 + 10 + 15 + 20) = 20 + 20.4 = 40.4$ ,  $(20 - 10) + 20.4 = 30.4$ ,  $(20 - 15) + 20.4 = 25.4$  and  $(20 - 20) + 20.4 = 20.4$ , respectively. As you can see, the others' earnings in the extra period are determined by their first period decisions and by your conditional allocation schedule given their first period decisions. Note that each individual in the group has the same likelihood of being the one whose conditional allocation schedule is used. The extra period between periods 1 and 2 is the only period in the experiment in which earnings are affected by one of the schedules that you or another person in your group submits in this additional decision task.

### *Comprehension questions*

Please answer the following questions. Raise your hand if you need help. A member of the experiment team will come to help you and will check your answers when you are done.

1. Suppose all five individuals in your group allocate 0 points to the group account.

a) How much do you earn? \_\_\_\_\_

b) How much do the others each earn? \_\_\_\_\_

2. Suppose all five allocate 20 points to the group account.

a) How much do you earn? \_\_\_\_\_

b) How much do the others each earn? \_\_\_\_\_

3. Suppose the others in your group allocate 40 points in total to the group account.

a) How much do you earn if you allocate 0 points to the group account? \_\_\_\_\_

b) How much do you earn if you allocate 10 points to the group account? \_\_\_\_\_

c) How much do you earn if you allocate 20 points to the group account? \_\_\_\_\_

4. In how many periods will conditional allocation schedules affect earnings? \_\_\_\_\_

[When the comprehension questions were reached, experimenter asked subjects to try to answer on their own and said that members of the experiment team would come around to check that participants had correctly answered all questions, and that if any had any questions about the questions they should raise their hand and one of us would come to help them.]

[When every subject solved all questions, an experimenter explained answers using the white board.]

[After Phase 1, the following instructions were read:]

“We’ve just completed phase 1 and will now begin phase 2, which also consists of four periods of play. Phase 2 is different from phase 1, and now, we will distribute a new instruction. I will read the instructions.”

[In the **3(FI)-N** treatment, the experimenter began to read aloud the following instructions, of which the subjects also had printed copies:]

## Instructions for Phase 2

The next four periods are like the previous four in that you continue to interact with the same four individuals and in each period you make a decision about allocating 20 points to either a private account or a group account. The earnings consequences of your decisions are also as before. But this time, there is no additional period in which the conditional schedule plays a role, and there is a significant difference in that each period consists of two stages. In the first stage, you make your allocation decision and learn the decisions of the other group members along with your earnings. In the second stage, your earnings from the allocation stage can be reduced. Whether or not your earnings are reduced and the amount of the reduction is determined by a fine rule that your group decides through voting. Your group chooses a rule by voting at the beginning of each period. When a rule is in place, the fines specified are automatically imposed, dependent on your allocation to the group account. Here is how it will work.

A fine rule consists of two parts. The first part is a decision on whether it is allocations to the **private** account or to the **group** account that are subject to a fine. The second part is a decision on the amount of the **fine per point** allocated to the account in question. Possible fine rates are 0, 0.4, 0.8 and 1.2 points per point allocated.

For each point that is lost by a subject who is fined, the group also incurs a cost of 1/3 point to impose that fine. For example, if an individual is fined a total of 3 points, this costs the group 1 point, with each group member (including the fine recipient) being charged 0.2 points (1/5 of 1 point) as his or her share of that cost. More generally, for each 1 point of fines imposed on any group member, each group member pays  $(1/3) * (1/5) =$  one fifteenth of a point as his or her per capita cost of imposing the fine. In the example of an individual fined 3 points, that individual thus loses both the 3 points and his or her per capita share of the cost, 0.2 points, for a total loss of 3.2 points. Notice that since the person fined loses a total of 3.2 points while the other group members pay 0.8 points in the aggregate (i.e.,  $4 \times 0.2$ ), the ultimate cost ratio is 1:4 ( $= 0.8:3.2$ ).

Fines in the present phase cannot bring an individual’s earnings for a period to less than zero. However, the per capita share of the cost of imposing fines is always fully born, even if it brings one’s earnings for the period to less than zero. This means that your earnings for a period can be calculated as follows:

$$\begin{aligned} & \{ \text{The greater of } [20 - (\text{points you allocate to group account}) \\ & + 0.4 * (\text{sum of points allocated by all group members to group account}) \end{aligned}$$

$$- (\text{your fine}) \text{ and } 0\}$$

$$- (\text{your per capita share of the cost of all fines imposed}),$$

where your fine = (per-unit fine rate)\*(points you allocated to group account)  
 if allocations to the **group** account are fined  
 OR (per-unit fine rate)\*(points you allocated to private account)  
 if allocations to the **private** account are fined  
 and  
 your per capita share of fine cost = (sum of fines in your group)\*(1/3)\*(1/5)  
 “ “ “ “ \*(1/15)

Your group selects which allocations are subject to fine by majority vote (3 votes or more). The fine rate selected will be the median of the preferred levels entered by individual group members. For example, if individuals enter choices of 0, 0, 0.4, 0.4 and 1.2 as their preferred fine rates, the group's choice is 0.4. If choices entered are 0, 0, 0, 0.8 and 1.2, the group's choice is 0.

Note that there is effectively no fine if your group chooses a fine rate of 0. Also, if the fine rate is positive, earnings at the end of a period may be unchanged from those at the end of the allocation stage if no member allocates points to the account that is subject to a fine.

In each period of this phase, your group will first vote on which account (**group** or **private**) will be subject to a fine. You will then see a report regarding which option was chosen, and will vote on the fine rate. You will know both parts of the rule before making your decision on allocating points to your private or group account.

### *Comprehension questions*

Please answer the following questions. Raise your hand if you need help. A member of the experiment team will come to help you and will check your answers when you are done. When we confirm that everyone has answered the questions correctly, we will start Phase 2.

1. Suppose the votes in your group are:  
 Step 1: Group, Private, Group, Private, Group

Which allocations are subject to a fine? \_\_\_\_\_ account

2. Suppose the votes in your group are:  
 Step 2: 0.4, 1.2, 0.8, 0.4, 0.8

What is the fine per point in your group? \_\_\_\_\_

3. Suppose that your group votes to fine allocations to the **private** accounts at a rate of 1.2 points per point allocated, and suppose you allocate 15 points to the group account.
- a) What fine will you be assessed? \_\_\_\_\_ points
  - b) How many points will you be charged as your share of the cost of imposing that fine? \_\_\_\_\_ points

[In the **3(IF)-N** treatment, the experimenter began to read aloud the following instructions, of which the subjects also had printed copies:]

## Instructions for Phase 2

The next four periods are like the previous four in that you continue to interact with the same four individuals and in each period you make a decision about allocating 20 points to either a private account or a group account. The earnings consequences of your decisions are also as before. But this time, there is no additional period in which the conditional schedule plays a role, and there is a significant difference in that each period consists of two stages. In the first stage, you make your allocation decision and learn the decisions of the other group members along with your earnings. In the second stage, you have an opportunity to reduce the earnings of others in your group at a cost to your own earnings. Here is how it will work.

After the first stage of each period, you will be shown the amount allocated to the group account by each of the others in your group, **in a random order**, and in a box below that information you will be asked to enter a whole number of points (if any) that you wish to use to reduce the earnings of the individual who made that allocation decision (see below). Each point you allocate to reducing another's earnings **reduces your own earnings by 1 point and reduces that individual's earnings by 4 points**. Your own earnings can be reduced in the same way by the decisions of others in your group. You are free to leave any or all others' earnings unchanged by entering 0's in the relevant boxes.

Period		Remaining time [sec]: 59			
6 out of 24					
<b>Allocation and deduction decisions</b>	<b>Your result</b>	<b>Other members' allocations to group account</b>			
Allocation to the group account:	10	15	12	3	7
Your points for reduction:	-	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 50px; height: 20px; position: relative;"> <div style="position: absolute; left: 5px; top: 5px;">1</div> </div> <div style="border: 1px solid black; width: 50px; height: 20px;"></div> <div style="border: 1px solid black; width: 50px; height: 20px;"></div> <div style="border: 1px solid black; width: 50px; height: 20px;"></div> </div>			
Your Earning in the current period	28.80				
Remember that the earnings of the group members are reduced by 4 times the amounts you enter. To leave an individual's earnings unchanged, enter 0.					
<div style="border: 1px solid black; padding: 2px 10px;">OK</div>					

Note: Numbers shown are for illustration only.

Earnings Reductions directed at you in the present phase (Phase 2) cannot bring your earnings for the period to less than zero. However, the cost of giving reductions to others is always fully born even if it makes your period earnings negative. (If you lose points in a period, they are deducted from those you accumulate in other periods.) Thus, earnings in each period of this phase can be calculated as follows:

$$\left\{ \begin{aligned} &\text{The greater of } [20 - (\text{points you allocate to group account}) + 0.4 * (\text{sum of points allocated by all} \\ &\quad \text{in group to group account}) - \\ &\quad 4 * (\text{sum of reduction points directed at you by others in your group})] \text{ and } 0 \} \\ &- (\text{points you use to reduce others' earnings}) \end{aligned} \right.$$

For example, suppose that you use 0 points to reduce the earnings of the first and second group members whose allocations appear on the screen, you use 1 point to reduce the earnings of the third, and you use 2 points to reduce the earnings of the fourth. Suppose further that these individuals use 0, 1, 0 and 3 points to reduce your earnings. Then the third and fourth individuals' earnings for the period will be reduced by 4 and by 8 points, respectively, in addition to any reductions due to the decisions of others, although these reductions cannot bring their earnings below zero. Your own earnings for the period will be reduced by 3 points, your cost to impose reductions on others, plus  $(1 \times 4) + (3 \times 4) = 16$  points, the reductions imposed on your earnings by others. At the end of the reduction stage, you will learn that others decided to reduce your earnings by a total of 16 points although your actual earnings reduction will be less

if your allocation stage earnings are less than 16, but you will not be told which individuals reduced your earnings or by how much any given individual reduced your earnings. Others will also not know who in particular reduced their earnings by how much.

In addition to the fact that earnings from the allocation stage and reductions received cannot go below zero, the earnings reduction process is subject to two limits. First, your reduction points must be an integer. Second, you cannot assign more than 10 reduction points to any one individual in your group.

Remember that if no reductions are imposed (the reduction boxes are filled in with 0's), earnings after the reduction stage are the same as those before it.

### *Comprehension questions*

Please answer the following questions. Raise your hand if you need help. A member of the experiment team will come to help you and will check your answers when you are done.

- 1) How much does it cost you to reduce the earnings of another group member by 8 points?  
\_\_\_\_\_ points
- 2) Suppose that an individual earns 10 points from the allocation stage, spends 2 points on reducing others' earnings, and incurs no earnings reductions from others. What are the individual's earnings for this period? \_\_\_\_\_ points
- 3) Suppose that an individual earns 14 points from the allocation stage, spends 1 point on reducing others' earnings, and that others spend a total of 4 points to reduce her earnings. What are the individual's earnings for this period?  
\_\_\_\_\_

[In the **3(FI)-C** treatment, the experimenter began to read aloud the following instructions, of which the subjects also had printed copies:]

## Instructions for Phase 2

The next four periods are like the previous four in that you continue to interact with the same four individuals and in each period you make a decision about allocating 20 points to either a private account or a group account. The earnings consequences of your decisions are also as before. But this time, there is no additional period in which the conditional schedule plays a role, and there is a significant difference in that each period consists of two stages. In the first stage, you make your allocation decision and learn the decisions of the other group members along with your earnings. In the second stage, your earnings from the allocation stage can be reduced. Whether or not your earnings are reduced and the amount of the reduction is determined by a fine rule that your group decides through voting. Your group chooses a rule by voting at the beginning of each period. When a rule is in place, the fines specified are automatically imposed, dependent on your allocation to the group account. Here is how it will work.

A fine rule consists of two parts. The first part is a decision on whether it is allocations to the **private** account or to the **group** account that are subject to a fine. The second part is a decision on the amount of the **fine per point** allocated to the account in question. Possible fine rates are 0, 0.4, 0.8 and 1.2 points per point allocated.

For each point that is lost by a subject who is fined, the group also incurs a cost of  $1/3$  point to impose that fine. For example, if an individual is fined a total of 3 points, this costs the group 1 point, with each group member (including the fine recipient) being charged 0.2 points ( $1/5$  of 1 point) as his or her share of that cost. More generally, for each 1 point of fines imposed on any group member, each group member pays  $(1/3) \cdot (1/5) =$  one fifteenth of a point as his or her per capita cost of imposing the fine. In the example of an individual fined 3 points, that individual thus loses both the 3 points and his or her per capita share of the cost, 0.2 points, for a total loss of 3.2 points. Notice that since the person fined loses a total of 3.2 points while the other group members pay 0.8 points in the aggregate (i.e.,  $4 \times 0.2$ ), the ultimate cost ratio is 1:4 ( $= 0.8:3.2$ ).

In addition to the fines dependent on a rule that your group chooses, at the end of a period, a fixed cost of 5 points is also deducted from the earnings of each group member. This can be thought of as the fixed administrative cost of having a fine scheme in operation, a cost that doesn't depend on how frequently or infrequently fines are in fact imposed.

Once a fine rule is decided, you make an allocation decision, given your endowment of 20.

Fines in the present phase cannot bring an individual's earnings for a period to less than zero. However, the per capita share of the cost of imposing fines as well as a fixed cost of 5 points is always fully born, even if it brings one's earnings for the period to less than zero.

Your earnings can be thought of as having two parts:

Part 1: Earnings from the allocation stage minus your fine, or 0 if the latter is negative

-- minus --

Part 2: Your part of the cost of administering the fine scheme.



Note that you incur the cost of Part 2 even if it causes your net earnings for the period to be negative.

Restated, your earnings are:

Part 1 =  $\{20 - (\text{points you allocate to group account}) + 0.4 * (\text{sum of points allocated by all group members to group account}) - \text{the fine paid by you}\}$ , if the expression in brackets is  $\geq 0$ , otherwise 0.

-- minus --

Part 2 = fixed cost of 5 points + your per capita share of  $(1/3) * \text{total fines imposed}$   
= 5 points +  $(1/15) * \text{total fines imposed}$

Your group selects which allocations are subject to fine by majority vote (3 votes or more). The fine rate selected will be the median of the preferred levels entered by individual group members. For example, if individuals enter choices of 0, 0, 0.4, 0.4 and 1.2 as their preferred fine rates, the group's choice is 0.4. If choices entered are 0, 0, 0, 0.8 and 1.2, the group's choice is 0.

Note that there is effectively no fine if your group chooses a fine rate of 0, although earnings in this phase will nevertheless differ from those in Phase 1 due to the 5 point fixed administrative charge that is deducted from each individual's earnings at the end of each period. Also, even if the fine rate is positive, only the 5 point fixed administrative charge may be deducted from each individual's earnings at the end of a period if no member allocates points to the account that is subject to a fine.

In each period of this phase, your group will first vote on which account (**group or private**) will be subject to a fine. You will then see a report regarding which option was chosen, and will vote on the fine rate. You will know both parts of the rule before making your decision on allocating points to your private or group account.

### *Comprehension questions*

Please answer the following questions. Raise your hand if you need help. A member of the experiment team will come to help you and will check your answers when you are done. When we confirm that everyone has answered the questions correctly, we will start Phase 2.

1. Suppose the votes in your group are:  
Step 1: Group, Private, Group, Private, Group

Which allocations are subject to a fine? \_\_\_\_\_ account

2. Suppose the votes in your group are:  
Step 2: 0.4, 1.2, 0.8, 0.4, 0.8

What is the fine per point in your group? \_\_\_\_\_

3. What is the fixed charge each period for operating the fine scheme? \_\_\_\_\_  
(Remember that this charge is deducted from earnings at the end of the period, so you still have 20 points to allocate to your group and private accounts.)

4. Suppose that your group votes to fine allocations to the **private** accounts at a rate of 1.2 points per point allocated, and suppose you allocate 15 points to the group account.
- a) How many points will you lose in the form of a fine? \_\_\_\_\_ points
  - b) How many points will you be charged as your share of the cost of imposing that fine? \_\_\_\_\_ points

[In the **3(IF)-C** treatment, the experimenter began to read aloud the following instructions, of which the subjects also had printed copies:]

## Instructions for Phase 2

The next four periods are like the previous four in that you continue to interact with the same four individuals and in each period you make a decision about allocating 20 points to either a private account or a group account. The earnings consequences of your decisions are also as before. But this time, there is no additional period in which the conditional schedule plays a role, and there is a significant difference in that each period consists of two stages. In the first stage, you make your allocation decision and learn the decisions of the other group members along with your earnings. In the second stage, you have an opportunity to reduce the earnings of others in your group at a cost to your own earnings. Here is how it will work.

After the first stage of each period, you will be shown the amount allocated to the group account by each of the others in your group, **in a random order**, and in a box below that information you will be asked to enter a whole number of points (if any) that you wish to use to reduce the earnings of the individual who made that allocation decision (see below). Each point you allocate to reducing another's earnings **reduces your own earnings by 1 point and reduces that individual's earnings by 4 points**. Your own earnings can be reduced in the same way by the decisions of others in your group. You are free to leave any or all others' earnings unchanged by entering 0's in the relevant boxes.

Period		Remaining time [sec]: 59			
6 out of 24					
<b>Allocation and deduction decisions</b>	<b>Your result</b>	<b>Other members' allocations to group account</b>			
Allocation to the group account:	10	15	12	3	7
Your points for reduction:	-	<input style="width: 50px; height: 20px; border: 1px solid black;" type="text"/> <input style="width: 50px; height: 20px; border: 1px solid black;" type="text"/> <input style="width: 50px; height: 20px; border: 1px solid black;" type="text"/> <input style="width: 50px; height: 20px; border: 1px solid black;" type="text"/>			
Your Earning in the current period	28.80				
Remember that the earnings of the group members are reduced by 4 times the amounts you enter. To leave an individual's earnings unchanged, enter 0.					
<input style="border: 1px solid black; padding: 5px 10px;" type="button" value="OK"/>					

Note: Numbers shown are for illustration only.

Earnings reductions directed at you in the present phase cannot bring your earnings for the period to less than zero. However, the cost of giving reductions to others is always fully born even if it makes your period earnings negative. (If you lose points in a period, they are deducted from those you accumulate in other periods.) Thus, your earnings can be thought of as having two parts:

**Part 1:** Earnings from the allocation stage minus reductions by others in your group, or 0 if the latter is negative

-- minus --

**Part 2:** Points you use to reduce others' earnings

Note that you incur the cost in Part 2 even if it causes your net earnings for the period to be negative.

Restated, your earnings are:

{the greater of [20 – (points you allocate to group account) + 0.4\*(sum of points allocated by all in group to group account) – 4\*(sum of reduction points directed at you by others in your group)] and 0} – points you use to reduce others' earnings.

For example, suppose that you use 0 points to reduce the earnings of the first and second group members whose allocations appear on the screen, you use 1 point to reduce the earnings of the third, and you use 2 points to reduce the earnings of the fourth. Suppose further that these individuals use 0, 1, 0 and 3 points to reduce your earnings. Then the third and fourth individuals' earnings for the period will be reduced by 4 and by 8 points, respectively, in addition to any reductions due to the decisions of others, although these reductions cannot bring their earnings below zero. Your own earnings for the period will be reduced by 3 points, your cost to impose reductions on others, plus  $(1 \times 4) + (3 \times 4) = 16$  points, the reductions imposed on your earnings by others. At the end of the reduction stage, you will learn that others decided to reduce your earnings by a total of 16 points although your actual earnings reduction will be less if your allocation stage earnings are less than 16, but you will not be told which individuals reduced your earnings or by how much any given individual reduced your earnings. Others will also not know who in particular reduced their earnings by how much.

In addition to the fact that earnings from the allocation stage and reductions received cannot go below zero, the earnings reduction process is subject to two limits. First, your reduction points must be an integer. Second, you cannot assign more than 10 reduction points to any one individual in your group.

Remember that if no reductions are imposed (the reduction boxes are filled in with 0's), earnings after the reduction stage are the same as those before it.

### *Comprehension questions*

Please answer the following questions. Raise your hand if you need help. A member of the experiment team will come to help you and will check your answers when you are done.

- 1) How much does it cost you to reduce the earnings of another group member by 8 points?  
\_\_\_\_\_ points
- 2) Suppose that an individual earns 10 points from the allocation stage, spends 2 points on reducing others' earnings, and incurs no earnings reductions from others. What are the individual's earnings for this period? \_\_\_\_\_ points
- 3) Suppose that an individual earns 14 points from the allocation stage, spends 1 point on reducing others' earnings, and that others spend a total of 4 points to reduce her earnings. What are the individual's earnings for this period?  
\_\_\_\_\_

[Both in the **3(FI)-N**, **3(IF)-N**, **3(FI)-C** and **3(IF)-C** treatments, like the instruction of phase 1, when the comprehension questions were reached, experimenter asked subjects to try to answer on their own. Our experiment team came around to check that participants had correctly answered all questions. When every subject solved all questions, the experimenter explained answers using the white board. Then, experimenter said “If you have any questions about phase 2, please raise your hand. If not, we’ll begin Phase 2 now.”

[The following instructions were read after Phase 2:]

“We’ve just completed Phase 2 and will now begin Phase 3, which also consists of four periods of play but is different from phases 1 and 2. We will now distribute a new instruction, and I will read the instructions.”

[Then, in the **3(FI)-N** treatment, the experimenter began to read aloud the following instructions, of which the subjects also had printed copies:]

## Instructions for Phase 3

The four periods of Phase 3 are like the previous eight periods in that you continue to be grouped with the same four individuals and each period begins with an allocation phase having the same consequences for your earnings. As in Phase 2, your earnings from the allocation stages of the periods in Phase 3 can be reduced. This time, however, the reductions depend on decisions made by individuals in your group. In the first stage, you make your allocation decision and learn the decisions of the other group members along with your earnings. In the second stage, you have an opportunity to reduce the earnings of others in your group at a cost to your own earnings. Here is how it will work.

After the first stage of each period, you will be shown the amount allocated to the group account by each of the others in your group, **in a random order**, and in a box below that information you will be asked to enter a whole number of points (if any) that you wish to use to reduce the earnings of the individual who made that allocation decision (see below). Each point you allocate to reducing another’s earnings **reduces your own earnings by 1 point and reduces that individual’s earnings by 4 points**. (Note that the ratio of cost to the recipient versus cost to other(s) is thus the same as in phase 2.) Your own earnings can be reduced in the same way by the decisions of others in your group. You are free to leave any or all others’ earnings unchanged by entering 0’s in the relevant boxes.

Period		Remaining time [sec]: 59			
6 out of 24					
<b>Allocation and deduction decisions</b>		<b>Your result</b>		<b>Other members' allocations to group account</b>	
Allocation to the group account:		10		15      12      3      7	
Your points for reduction:		-		<input style="width: 50px; height: 20px; border: 1px solid black;" type="text"/> <input style="width: 50px; height: 20px; border: 1px solid black;" type="text"/> <input style="width: 50px; height: 20px; border: 1px solid black;" type="text"/> <input style="width: 50px; height: 20px; border: 1px solid black;" type="text"/>	
Your Earning in the current period		28.80			
Remember that the earnings of the group members are reduced by 4 times the amounts you enter. To leave an individual's earnings unchanged, enter 0.					
<input style="border: 1px solid black; padding: 2px 10px;" type="button" value="OK"/>					

Note: Numbers shown are for illustration only.

As with fines in Phase 2, earnings reductions directed at you in the present phase (Phase 3) cannot bring your earnings for the period to less than zero. However, like Phase 2, the cost of giving reductions to others is always fully born even if it makes your period earnings negative. (If you lose points in a period, they are deducted from those you accumulate in other periods.) Thus, your earnings in each period of this phase can be calculated as follows:

$$\left\{ \begin{aligned} &\text{The greater of } [20 - (\text{points you allocate to group account}) + 0.4 * (\text{sum of points allocated by all} \\ &\quad \text{in group to group account}) - \\ &\quad 4 * (\text{sum of reduction points directed at you by others in your group})] \text{ and } 0 \} \\ &- (\text{points you use to reduce others' earnings}) \end{aligned} \right.$$

For example, suppose that you use 0 points to reduce the earnings of the first and second group members whose allocations appear on the screen, you use 1 point to reduce the earnings of the third, and you use 2 points to reduce the earnings of the fourth. Suppose further that these individuals use 0, 1, 0 and 3 points to reduce your earnings. Then the third and fourth individuals' earnings for the period will be reduced by 4 and by 8 points, respectively, in addition to any reductions due to the decisions of others, although these reductions cannot bring their earnings below zero. Your own earnings for the period will be reduced by 3 points, your cost to impose reductions on others, plus  $(1 \times 4) + (3 \times 4) = 16$  points, the reductions imposed on your earnings by others. At the end of the reduction stage, you will learn that others decided to reduce your earnings by a total of 16 points although your actual earnings reduction will be less

if your allocation stage earnings are less than 16, but you will not be told which individuals reduced your earnings or by how much any given individual reduced your earnings. Others will also not know who in particular reduced their earnings by how much.

In addition to the fact that earnings from the allocation stage and reductions received cannot go below zero, the earnings reduction process is subject to two limits. First, your reduction points must be an integer. Second, you cannot assign more than 10 reduction points to any one individual in your group.

Remember that if no reductions are imposed (the reduction boxes are filled in with 0's), earnings after the reduction stage are the same as those before it.

### *Comprehension questions*

Please answer the following questions. Raise your hand if you need help. A member of the experiment team will come to help you and will check your answers when you are done.

- 1) How much does it cost you to reduce the earnings of another group member by 8 points?  
\_\_\_\_\_ points
- 2) Suppose that an individual earns 10 points from the allocation stage, spends 2 points on reducing others' earnings, and incurs no earnings reductions from others. What are the individual's earnings for this period? \_\_\_\_\_ points
- 3) Suppose that an individual earns 14 points from the allocation stage, spends 1 point on reducing others' earnings, and that others spend a total of 4 points to reduce her earnings. What are the individual's earnings for this period?  
\_\_\_\_\_

[In the **3(IF)-N** treatment, the experimenter began to read aloud the following instructions, of which the subjects also had printed copies:]

# Instructions for Phase 3

The four periods of Phase 3 are like the previous eight periods in that you continue to be grouped with the same four individuals and each period begins with an allocation phase having the same consequences for your earnings. As in Phase 2, your earnings from the allocation stages of the periods in Phase 3 can be reduced. This time, however the reductions depends on rules decided by your group as a whole, rather than being the result of decisions made by individual group members. Your group decides on a fine rule by voting, and when a rule is in place, the fines specified are automatically imposed.

A fine rule consists of two parts. The first part is a decision on whether it is allocations to the **private** account or to the **group** account that are subject to a fine. The second part is a decision on the amount of the **fine per point** allocated to the account in question. Possible fine rates are 0, 0.4, 0.8 and 1.2 points per point allocated.

For each point that is lost by a subject who is fined, the group also incurs a cost of 1/3 point to impose that fine. For example, if an individual is fined a total of 3 points, this costs the group 1 point, with each group member (including the fine recipient) being charged 0.2 points (1/5 of 1 point) as his or her share of that cost. More generally, for each 1 point of fines imposed on some group member, each group member pays  $(1/3) * (1/5) =$  one fifteenth of a point as his or her per capita cost of imposing the fine. In the example of an individual fined 3 points, that individual thus loses both the 3 points and his or her per capita share of the cost, 0.2 points, for a total loss of 3.2 points. Notice that since the person fined loses a total of 3.2 points while the other group members pay 0.8 points in the aggregate (i.e.,  $4 \times 0.2$ ), the ultimate cost ratio is 1:4 ( $= 0.8:3.2$ ), the same as the ratio of cost to reduce earnings and cost to person whose earnings were reduced, in Phase 2.

As with reductions in Phase 2, fines in the present phase cannot bring an individual's earnings for a period to less than zero. However, similar to Phase 2, the per capita share of the cost of imposing fines is always fully born, even if it brings one's earnings for the period to less than zero. This means that your earnings for a period can be calculated as follows:

$$\begin{aligned} & \{ \text{The greater of } [20 - (\text{points you allocate to group account}) \\ & + 0.4 * (\text{sum of points allocated by all group members to group account}) \\ & \quad - (\text{your fine})] \text{ and } 0 \} \\ & - (\text{your per capita share of the cost of all fines imposed}), \end{aligned}$$

where your fine = (per-unit fine rate)\*(points you allocated to group account)

if allocations to the **group** account are fined

OR (per-unit fine rate)\*(points you allocated to private account)

if allocations to the **private** account are fined

and



your per capita share of fine cost = (sum of fines in your group)\*(1/3)\*(1/5)  
 “ “ “ “ \*(1/15)

Your group selects which allocations are subject to fine by majority vote (3 votes or more). The fine rate selected will be the median of the preferred levels entered by individual group members. For example, if individuals enter choices of 0, 0, 0.4, 0.4 and 1.2 as their preferred fine rates, the group's choice is 0.4. If choices entered are 0, 0, 0, 0.8 and 1.2, the group's choice is 0.

Note that there is effectively no fine if your group chooses a fine rate of 0. Also, if the fine rate is positive, earnings at the end of a period may be unchanged from those at the end of the allocation stage if no member allocates points to the account that is subject to a fine.

In each period of this phase, your group will first vote on which account (**group** or **private**) will be subject to a fine. You will then see a report regarding which option was chosen, and will vote on the fine rate. You will know both parts of the rule before making your decision on allocating points to your private or group account.

### Comprehension questions

Please answer the following questions. Raise your hand if you need help. A member of the experiment team will come to help you and will check your answers when you are done. When we confirm that everyone has answered the questions correctly, we will start Phase 3.

1. Suppose the votes in your group are:  
Step 1: Group, Private, Group, Private, Group

Which allocations are subject to a fine? \_\_\_\_\_ account

2. Suppose the votes in your group are:  
Step 2: 0.4, 1.2, 0.8, 0.4, 0.8

What is the fine per point in your group?

3. Suppose that your group votes to fine allocations to the **private** accounts at a rate of 1.2 points per point allocated, and suppose you allocate 15 points to the group account.
- What fine will you be assessed? \_\_\_\_\_ points
  - How many points will you be charged as your share of the cost of imposing that fine? \_\_\_\_\_ points

[In the **3(FI)-C** treatment, the experimenter began to read aloud the following instructions, of which the subjects also had printed copies:]

## Instructions for Phase 3

The four periods of Phase 3 are like the previous eight periods in that you continue to be grouped with the same four individuals and each period begins with an allocation phase having the same consequences for your earnings. As in Phase 2, your earnings from the allocation stages of the periods in Phase 3 can be reduced. This time, however, the reductions depend on decisions made by individuals in your group. In the first stage, you make your allocation decision and learn the decisions of the other group members along with your earnings. In the second stage, you have an opportunity to reduce the earnings of others in your group at a cost to your own earnings. Here is how it will work.

After the first stage of each period, you will be shown the amount allocated to the group account by each of the others in your group, **in a random order**, and in a box below that information you will be asked to enter a whole number of points (if any) that you wish to use to reduce the earnings of the individual who made that allocation decision (see below). Each point you allocate to reducing another's earnings **reduces your own earnings by 1 point and reduces that individual's earnings by 4 points**. (Note that the ratio of cost to the recipient versus cost to other(s) is thus the same as in phase 2.) Your own earnings can be reduced in the same way by the decisions of others in your group. You are free to leave any or all others' earnings unchanged by entering 0's in the relevant boxes.

Period		Remaining time [sec]: 59					
6 out of 24							
<table style="width: 100%; border: none;"> <tr> <td style="width: 35%; vertical-align: top;"> <b>Allocation and deduction decisions</b>  Allocation to the group account:  Your points for reduction:  Your Earning in the current period </td> <td style="width: 15%; vertical-align: top; text-align: center;"> <b>Your result</b>  10  -  28.80 </td> <td style="width: 40%; vertical-align: top;"> <b>Other members' allocations to group account</b>  <div style="display: flex; justify-content: space-around; margin-bottom: 5px;"> <span>15</span><span>12</span><span>3</span><span>7</span> </div> <div style="display: flex; justify-content: space-around;"> <input style="width: 40px; height: 20px;" type="text"/> <input style="width: 40px; height: 20px;" type="text"/> <input style="width: 40px; height: 20px;" type="text"/> <input style="width: 40px; height: 20px;" type="text"/> </div> </td> <td style="width: 10%; vertical-align: top; color: red; font-size: small;"> Remember that the earnings of the group members  are reduced by 4 times the amounts you enter.  To leave an individual's earnings unchanged, enter 0. </td> </tr> </table>				<b>Allocation and deduction decisions</b> Allocation to the group account: Your points for reduction: Your Earning in the current period	<b>Your result</b> 10 - 28.80	<b>Other members' allocations to group account</b> <div style="display: flex; justify-content: space-around; margin-bottom: 5px;"> <span>15</span><span>12</span><span>3</span><span>7</span> </div> <div style="display: flex; justify-content: space-around;"> <input style="width: 40px; height: 20px;" type="text"/> <input style="width: 40px; height: 20px;" type="text"/> <input style="width: 40px; height: 20px;" type="text"/> <input style="width: 40px; height: 20px;" type="text"/> </div>	Remember that the earnings of the group members are reduced by 4 times the amounts you enter. To leave an individual's earnings unchanged, enter 0.
<b>Allocation and deduction decisions</b> Allocation to the group account: Your points for reduction: Your Earning in the current period	<b>Your result</b> 10 - 28.80	<b>Other members' allocations to group account</b> <div style="display: flex; justify-content: space-around; margin-bottom: 5px;"> <span>15</span><span>12</span><span>3</span><span>7</span> </div> <div style="display: flex; justify-content: space-around;"> <input style="width: 40px; height: 20px;" type="text"/> <input style="width: 40px; height: 20px;" type="text"/> <input style="width: 40px; height: 20px;" type="text"/> <input style="width: 40px; height: 20px;" type="text"/> </div>	Remember that the earnings of the group members are reduced by 4 times the amounts you enter. To leave an individual's earnings unchanged, enter 0.				
<input style="border: 1px solid black; padding: 2px 10px;" type="button" value="OK"/>							

Note: Numbers shown are for illustration only.

As with fines in Phase 2, earnings reductions directed at you in the present phase (Phase 3) cannot bring your earnings for the period to less than zero. However, like Phase 2, the cost of giving reductions to others is always fully born even if it makes your period earnings negative. (If you lose points in a period, they are deducted from those you accumulate in other periods.) Thus, your earnings in each period of this phase can be calculated as follows:

$$\left\{ \begin{aligned} &\text{The greater of } [20 - (\text{points you allocate to group account}) + 0.4 * (\text{sum of points allocated by all} \\ &\quad \text{in group to group account}) - \\ &\quad 4 * (\text{sum of reduction points directed at you by others in your group})] \text{ and } 0 \} \\ &- (\text{points you use to reduce others' earnings}). \end{aligned} \right.$$

where, to maintain parallelism with Phase 2, we could also have called the quantity in the large curly brackets “Part 1” of your payment and the amount in parentheses in the last line “Part 2”, noting that Part 1 must be greater than or equal to zero and that Part 2 is subtracted from it.

For example, suppose that you use 0 points to reduce the earnings of the first and second group members whose allocations appear on the screen, you use 1 point to reduce the earnings of the third, and you use 2 points to reduce the earnings of the fourth. Suppose further that these individuals use 0, 1, 0 and 3 points to reduce your earnings. Then the third and fourth individuals' earnings for the period will be reduced by 4 and by 8 points, respectively, in addition to any reductions due to the decisions of others, although these reductions cannot bring

their earnings below zero. Your own earnings for the period will be reduced by 3 points, your cost to impose reductions on others, plus  $(1 \times 4) + (3 \times 4) = 16$  points, the reductions imposed on your earnings by others. At the end of the reduction stage, you will learn that others decided to reduce your earnings by a total of 16 points although your actual earnings reduction will be less if your allocation stage earnings are less than 16, but you will not be told which individuals reduced your earnings or by how much any given individual reduced your earnings. Others will also not know who in particular reduced their earnings by how much.

In addition to the fact that earnings from the allocation stage and reductions received cannot go below zero, the earnings reduction process is subject to two limits. First, your reduction points must be an integer. Second, you cannot assign more than 10 reduction points to any one individual in your group.

Remember that if no reductions are imposed (the reduction boxes are filled in with 0's), earnings after the reduction stage are the same as those before it.

### *Comprehension questions*

Please answer the following questions. Raise your hand if you need help. A member of the experiment team will come to help you and will check your answers when you are done.

- 1) How much does it cost you to reduce the earnings of another group member by 8 points?  
\_\_\_\_\_ points
- 2) Suppose that an individual earns 10 points from the allocation stage, spends 2 points on reducing others' earnings, and incurs no earnings reductions from others. What are the individual's earnings for this period? \_\_\_\_\_ points
- 3) Suppose that an individual earns 14 points from the allocation stage, spends 1 point on reducing others' earnings, and that others spend a total of 4 points to reduce her earnings. What are the individual's earnings for this period?  
\_\_\_\_\_

[In the **3(IF)-C** treatment, the experimenter began to read aloud the following instructions, of which the subjects also had printed copies:]

## Instructions for Phase 3

The four periods of Phase 3 are like the previous eight periods in that you continue to be grouped with the same four individuals and each period begins with an allocation phase having the same consequences for your earnings. As in Phase 2, your earnings from the allocation stages of the periods in Phase 3 can be reduced. This time, however the reductions depends on rules decided by your group as a whole, rather than being the result of decisions made by individual group members. Your group decides on a fine rule by voting, and when a rule is in place, the fines specified are automatically imposed.

A fine rule consists of two parts. The first part is a decision on whether it is allocations to the **private** account or to the **group** account that are subject to a fine. The second part is a decision on the amount of the **fine per point** allocated to the account in question. Possible fine rates are 0, 0.4, 0.8 and 1.2 points per point allocated.

For each point that is lost by a subject who is fined, the group also incurs a cost of  $1/3$  point to impose that fine. For example, if an individual is fined a total of 3 points, this costs the group 1 point, with each group member (including the fine recipient) being charged 0.2 points ( $1/5$  of 1 point) as his or her share of that cost. More generally, for each 1 point of fines imposed on any group member, each group member pays  $(1/3)*(1/5) =$  one fifteenth of a point as his or her per capita cost of imposing the fine. In the example of an individual fined 3 points, that individual thus loses both the 3 points and his or her per capita share of the cost, 0.2 points, for a total loss of 3.2 points. Notice that since the person fined loses a total of 3.2 points while the other group members pay 0.8 points in the aggregate (i.e.,  $4 \times 0.2$ ), the ultimate cost ratio is 1:4 ( $= 0.8:3.2$ ), the same as the ratio of cost to reduce earnings and cost to person whose earnings were reduced, in Phase 2.

In addition to the fines dependent on a rule that your group chooses, at the end of a period, a fixed cost of 5 points is also deducted from the earnings of each group member. This can be thought of as the fixed administrative cost of having a fine scheme in operation, a cost that doesn't depend on how frequently or infrequently fines are in fact imposed.

Once a fine rule is decided, as in previous phases, you make an allocation decision, given your endowment of 20.

Fines in the present phase cannot bring an individual's earnings for a period to less than zero, as in Phase 2. However, the per capita share of the cost of imposing fines as well as a fixed cost of 5 points is always fully born, even if it brings one's earnings for the period to less than zero.

Your earnings can be thought of as having two parts:

**Part 1:** Earnings from the allocation stage minus your fine, or 0 if the latter is negative  
-- minus --

**Part 2:** Your part of the cost of administering the fine scheme = fixed cost of 5 points + your per capita share of  $(1/3)*\text{total fines imposed} = 5 + (1/15)*(\text{total fines imposed})$ .

Note that you incur the cost of Part 2 even if it causes your net earnings for the period to be negative.

Restated, your earnings are:

{the greater of  $[20 - (\text{points you allocate to group account}) + 0.4 * (\text{sum of points allocated by all group members to group account}) - \text{the fine paid by you}]$  and 0}  
-  $[(5 \text{ points} + (1/15) * (\text{total fines imposed}))]$

Your group selects which allocations are subject to fine by majority vote (3 votes or more). The fine rate selected will be the median of the preferred levels entered by individual group members. For example, if individuals enter choices of 0, 0, 0.4, 0.4 and 1.2 as their preferred fine rates, the group's choice is 0.4. If choices entered are 0, 0, 0, 0.8 and 1.2, the group's choice is 0.

Note that there is effectively no fine if your group chooses a fine rate of 0, although earnings in this phase will nevertheless differ from those in Phase 1 due to the 5 point fixed administrative charge that is deducted from each individual's earnings at the end of each period. Also, even if the fine rate is positive, only the 5 point fixed administrative charge may be deducted from each individual's earnings at the end of a period if no member allocates points to the account that is subject to a fine.

In each period of this phase, your group will first vote on which account (**group** or **private**) will be subject to a fine. You will then see a report regarding which option was chosen, and will vote on the fine rate. You will know both parts of the rule before making your decision on allocating points to your private or group account.

### *Comprehension questions*

Please answer the following questions. Raise your hand if you need help. A member of the experiment team will come to help you and will check your answers when you are done. When we confirm that everyone has answered the questions correctly, we will start Phase 3.

1. Suppose the votes in your group are:  
Step 1: Group, Private, Group, Private, Group

Which allocations are subject to a fine? \_\_\_\_\_ account

2. Suppose the votes in your group are:  
Step 2: 0.4, 1.2, 0.8, 0.4, 0.8

What is the fine per point in your group? \_\_\_\_\_

3. What is the fixed charge each period for operating the fine scheme? \_\_\_\_\_

(Remember that this charge is deducted from earnings at the end of the period, so you still have 20 points to allocate to your group and private accounts.)

4. Suppose that your group votes to fine allocations to the **private** accounts at a rate of 1.2 points per point allocated, and suppose you allocate 15 points to the group account.
- a) How many points will you lose in the form of a fine? \_\_\_\_\_ points
  - b) How many points will you be charged as your share of the cost of imposing that fine? \_\_\_\_\_ points

[Both in the (3FI)-N, 3(IF)-N, 3(FI)-C and 3(IF)-C treatment, like the instruction of phase 1 and phase 2, when the comprehension questions were reached, experimenter asked subjects to try to answer on their own. Our experiment team came around to check that participants had correctly answered all questions. When every subject solved all questions, the experimenter explained answers using the white board. Then, experimenter said “If you have any questions about phase 3, please raise your hand. If not, we’ll begin Phase 3 now.”

[The following instructions were read after Phase 3:]

“We’ve just completed Phase 3. There is one final set of instructions which cover phases 4, 5 and 6. These will now be distributed and I ask you to read along with me as before.”

[Then the experimenter began to read aloud the following instructions, of which the subjects also had printed copies:]

## Instructions for Phases 4, 5 and 6

The next three phases of the experiment, which will also be the last phases of the main portion of the experiment, will resemble either Phase 2 or Phase 3, depending on which of the two schemes your group chooses to follow in each phase. You will remain in a group with the same four others and will make four allocation decisions in a given phase. At the beginning of each phase, you will vote on whether to use the scheme in which the group votes on the rules of a fine (which will be referred to on the voting screen as “Group-determined fines”) or the scheme in which individuals can reduce others’ earnings after learning of their allocations (which will be referred to on the voting screen as “Individual reduction decisions”). Whichever scheme gets the most votes will be in effect for four periods of allocation decisions. You can select different schemes in different phases (4 periods = a phase).

The way to calculate your earnings is exactly the same as in Phases 2 or 3, depending on which scheme your group chooses.

### *Comprehension questions*

Please answer the following questions. Raise your hand if you need help. A member of the experiment team will come to help you and will check your answers when you are done.

1. How many periods are left in the main portion of the experiment? \_\_\_\_\_
2. How many times do you have the opportunity to vote on whether to use the scheme in which the group votes on the rules of a fine or the scheme in which individuals can reduce others' earnings after learning of their allocations?  
\_\_\_\_\_
3. If your group selects the scheme of individual reductions in Phase 4, can it select a different scheme in Phase 5?  
\_\_\_\_\_

[Like the instruction of phases 1, 2 and 3, when the comprehension questions were reached, experimenter asked subjects to try to answer on their own. Our experiment team came around to check that participants had correctly answered all questions. When every subject solved all questions, the experimenter explained answers. Then, experimenter said "If you have any questions about phases 4 – 6, please raise your hand. If not, we'll begin Phase 4 now."

### **(c) 6-Vote treatments**

At the beginning of the session, the experimenter said to all subjects present: "Today you will take part in one main experiment and two shorter tasks, and we expect the whole thing to take less than two and a half hours. The main experiment is divided into 7 phases, where phase 1 consists of one regular period and one additional period and phases 2 – 7 consist of six sets of 4 periods. So, in total, there are 25 periods. We will now read the instructions for the first phase. Once phase 1 is over you will receive further instructions." Then the experimenter began to read aloud the following instructions, of which the subjects also had printed copies:



# Welcome

You are now taking part in a decision-making experiment. Depending on your decisions and the decisions of other participants, you will be able to earn money in addition to the \$5 guaranteed for your participation. Please read the following instructions carefully.

During the experiment you are not allowed to communicate with other participants. If you have a question, raise your hand. One of us will come to answer your question.

During the experiment your earnings will be calculated in points. At the end of the experiment points will be converted to U.S. dollars at the following rate:

**34 points = \$1**

(This means each point will exchange for just under 3 cents of real money.) At the end of the experiment your total earnings (including the \$5 participation fee) will be paid out to you in cash.

The experiment has seven phases, where phase 1 consists of one regular period and one additional period and phases 2 – 7 consist of six sets of 4 periods (in total, 24 periods in phases 2 - 7). The following instructions explain the details of phase 1. The details of the subsequent phases will be explained after phase 1.

## Instructions for Phase 1

In the experiment, each participant is randomly assigned to a **group of 5**. This means that you are in a group with four other participants. **You will be part of the same group throughout the entire experiment.** Nobody knows which other participants are in their group, and nobody will be informed who was in which group after the experiment.

Phase 1 consists of one regular period and one additional period. In the regular period, each group member, yourself included, will be given an **endowment of 20 points**, and you will have to make a decision on how to allocate the endowment between two accounts.

### *Your decision*

There are two possibilities:

- 1. You can allocate points to a group account.**
- 2. You can allocate points to a private account.**

You will be asked to indicate the number of points you want to allocate to the group account. Only integers between 0 and 20 are allowed for this purpose. The remaining points will automatically be allocated to your private account. Your earnings depend on the total number of points in the group account, and the number of points in your private account.

### *How to calculate your earnings*

Your earnings from your private account are equal to the number of points you allocate to it. That is, **for each point you allocate to your private account you get 1 point as earnings**. For example, your earnings from the private account equal 3 points if you allocate 3 points to it. The points you allocate to your private account do not affect the earnings of the others in your group.

Your earnings from the group account equal the **sum** of points allocated to the group account by all 5 group members multiplied by 0.4. **For each point you allocate to the group account you and all others in your group each get 0.4 points as earnings**. For example, if the sum of points in the group account is 30, then your earnings from the group account and the earnings of each of the others in your group from the group account are equal to 12 points.

Your earnings can be calculated with the following formula:

$$20 - (\text{points you allocated to the group account}) + 0.4 * (\text{sum of points allocated by all group members to the group account})$$

Note that you get 1 point as earnings for each point you allocate to your private account. If you instead allocate 1 extra point to the group account, your earnings from the group account increase by  $0.4 * 1 = 0.4$  points and your earnings from your private account decrease by 1 point. However, by allocating 1 extra point to the group account, the earnings of each of the other 4 group members also increase by 0.4 points. Therefore, the total group earnings increase by  $0.4 * 5 = 2$  points. Note that you also obtain earnings from points allocated to the group account by others. You obtain  $0.4 * 1 = 0.4$  points for each point allocated to the group account by another member.

### *The additional period and conditional allocation decision*

Before making your first allocation decision as described above, you will be asked to make a set of conditional allocation decisions, which may also impact your earnings. At the start of the experiment, you will be asked to enter numbers into a form of the kind shown below, by which you will indicate how many of 20 points you want to allocate to the group account assuming that the others in your group, on average, allocate the amount shown. For example, in the top box, you'll enter the number of points you want to allocate if the others all allocate 0 to the group account; in the middle box, the number of points you want to allocate if the others allocate an average of 10; and in the last box, the number you want to allocate if they allocate an average of 20. The completed form is called a "conditional allocation schedule." In this schedule as well, you can only enter integers between 0 and 20.

Period
1 out of 24
Remaining time [sec]: 118

**Please begin by filling in your conditional allocation schedule**

If others on average choose 0, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 1, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 2, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 3, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 4, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 5, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 6, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 7, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 8, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 9, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 10, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 11, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 12, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 13, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 14, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 15, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 16, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 17, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 18, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 19, I choose	<input style="width: 50px;" type="text"/>
If others on average choose 20, I choose	<input style="width: 50px;" type="text"/>

The choices you will enter in it will affect your earnings in the following way: after you and the others in your group fill in this decision form, you will be asked to make the unconditional allocation decision and payments for period 1 will be determined as described above. Then, one subject in your group will be **randomly** selected as the one whose conditional allocation schedule is used, and that subject's allocation for an additional period will be determined by his/her conditional allocation schedule and the average of the other four individuals' unconditional allocation decisions. In the additional period, allocations of the four group members whose conditional allocation schedules are not selected are the same as in period one (the regular period).

For example, suppose that you allocate 5 points to the group account in period 1 and that the others in your group allocate 0, 10, 15, and 20 points, respectively. Also suppose that you are the group member who is randomly selected as the one whose conditional allocation schedule is used. Then, the average unconditional allocation decisions by the four others is 11 (rounded from 11.25). Suppose that your conditional allocation schedule says that if others allocate an average of 11, you will allocate 6. Then, your allocation in the additional period is 6. So in the additional period, you will earn  $(20 - 6) + 0.4 \cdot (6 + 0 + 10 + 15 + 20) = 14 + .4 \cdot (51) = 14 + 20.4 = 34.4$ . The earnings of the individual who assigned 15 to the group account in period 1 will be  $(20 - 15) + .4 \cdot (51) = 5 + 20.4 = 25.4$  in the additional period. And so on. Note that each member of the group has an equal chance of being the one whose conditional schedule is used. Also note that the additional period in Phase 1 is the only time during the experiment that a conditional schedule affects earnings.

### *Comprehension questions*

Please answer the following questions. Raise your hand if you need help. A member of the experiment team will come to help you and will check your answers when you are done.

1. Suppose allocations to the group account by all five individuals in your group are 0 points.

a) How much do you earn? \_\_\_\_\_ points

b) How much do the others each earn? \_\_\_\_\_ points

2. Suppose allocations to the group account by all five are 20 points.

a) How much do you earn? \_\_\_\_\_ points

b) How much do the others each earn? \_\_\_\_\_ points

3. Suppose allocations to the group account by the others in your group are 40 points in total.

a) How much do you earn if your allocation to the group account is 0 points? \_\_\_\_\_ points

b) How much do you earn if your allocation to the group account is 10 points? \_\_\_\_\_ points

c) How much do you earn if your allocation to the group account is 20 points? \_\_\_\_\_ points

4. Suppose that you enter 10 in all blanks of the conditional allocation schedule. Also, suppose that in the first regular decision you allocate 0 to the group account and others in your group allocate 3, 6, 9 and 20, respectively, to the group account. If you are chosen as the subject whose conditional allocation schedule is used, how much do you earn in the additional period?  
\_\_\_\_\_ points

5. Using the same information as question 4, how much does the subject who allocates 9 to the group account in period 1 earn in the additional period? \_\_\_\_\_ points

[When every subject solved all questions, an experimenter explained answers using the white board.]

[After Phase 1, the following instructions were read:]

“We’ve just completed phase 1 and will now move on to phases 2 – 7, and we will distribute a new instruction. I will read the instructions.”

[In the **6-N** treatment, the experimenter began to read aloud the following instructions, of which the subjects also had printed copies:]

## Instructions for Phases 2 – 7

The next six phases each consist of 4 periods resembling period 1 of Phase 1. You will continue to interact with the same four individuals and in each period you will make a decision about allocating 20 points to either a private account or a group account, with the same immediate payment consequence (you earn 1 point for each point you allocate to your private account, and each group member earns 0.4 points for each point you or another member allocates to the group account). However, there will be no additional periods in which earnings are affected by the conditional allocation schedule you completed in Phase 1. Moreover, each period will now include a second stage in which your earnings from the first stage may be altered. There are two possible schemes governing the second stage of each period, which will be explained to you in these instructions. At the beginning of each phase, your group will determine by majority vote which of the two schemes will be used during the four periods of that phase. You can select different schemes in different phases. At the end of these six phases (24 periods), the main part of today’s experiment will be over.

Your allocation decision in stage 1 of each period is exactly as before, so we will focus now on the two schemes one of which you will choose to have in place for the second stage of each period.

Of the two possible schemes that your group may choose from, one is a scheme in which the group votes on the rules of a fine (which will be referred to on the voting screen as “**Group-determined fines**”); the other is a scheme in which individuals can reduce others’ earnings after learning of their allocations (which will be referred to on the voting screen as “**Individual reduction decisions**”).

### **Scheme (1): Group-determined fines**

In this scheme, earnings from the allocation stage can be reduced by a *fine rule* that your group chooses by voting *at the beginning of each period*. When a rule is in place, the fines specified are automatically imposed when triggered by an allocation decision, as explained presently.

A fine rule consists of two parts. The first part is a decision on whether it is allocations to the **private** account or to the **group** account that are subject to a fine. The second part is a decision on the amount of the **fine per point** allocated to the account in question. Possible fine rates are 0, 0.4, 0.8 and 1.2 points per point allocated.

For each point that is lost by a subject who is fined, the group also incurs a cost of **1/3** point to impose that fine. For example, if an individual is fined a total of 3 points, this costs the group 1 point, with each group member (including the fine recipient) being charged 0.2 points (1/5 of 1

point) as his or her share of that cost. More generally, for each 1 point of fines imposed on any group member, each group member pays  $(1/3)*(1/5)$  = one fifteenth of a point as his or her per capita cost of imposing the fine. In the example of an individual fined 3 points, that individual thus loses both the 3 points and his or her per capita share of the cost, 0.2 points, for a total loss of 3.2 points. Notice that since the person fined loses a total of 3.2 points while the other four group members pay 0.8 points in the aggregate (i.e.,  $4 \times 0.2$ ), the ultimate cost ratio is 4:1 (3.2:0.8).

Fines in the present stage cannot bring an individual's earnings for a period to less than zero. However, the per capita share of the cost of imposing fines *is* always fully born, even if it brings one's earnings for the period to less than zero. (If you lose points in a period, they are deducted from those you accumulate in other periods.) This means that your earnings for a period can be calculated as follows:

$$\begin{aligned} & \{ \text{The greater of } [20 - (\text{points you allocate to group account}) \\ & + 0.4 * (\text{sum of points allocated by all group members to group account}) \\ & \quad - (\text{your fine})] \text{ and } 0 \} \\ & - (\text{your per capita share of the cost of all fines imposed}), \end{aligned}$$

where your fine = (per-unit fine rate)\*(points you allocated to group account)  
if allocations to the **group** account are fined  
OR (per-unit fine rate)\*(points you allocated to private account)  
if allocations to the **private** account are fined

and

$$\begin{aligned} \text{your per capita share of fine cost} &= (\text{sum of fines in your group}) * (1/3) * (1/5) \\ &\quad \text{"} \quad \text{"} \quad \text{"} \quad \text{"} \quad * (1/15) \end{aligned}$$

Your group selects which allocations are subject to fine by majority vote (3 votes or more). The fine rate selected will be the median of the preferred levels entered by individual group members. For example, if individuals enter choices of 0, 0, 0.4, 0.4 and 1.2 as their preferred fine rates, the group's choice is 0.4. If choices entered are 0, 0, 0, 0.8 and 1.2, the group's choice is 0.

Note that there is effectively no fine if your group chooses a fine rate of 0. Also, if the fine rate is positive, earnings at the end of a period may be unchanged from those at the end of the allocation stage if no member allocates points to the account that is subject to a fine.

In each period of this phase, your group will first vote on which account (**group** or **private**) will be subject to a fine. You will then see a report regarding which option was chosen, and will vote on the fine rate. You will know both parts of the rule before making your decision on allocating points to your private or group account.

### Scheme (2): Individual reduction decisions

In this scheme, you have an opportunity in stage 2 of each period to reduce the earnings of others in your group at a cost to your own earnings. After you and others in your group make an allocation decision, you will see your earnings in the allocation stage and the amount allocated to the group account by each of the others in your group in a random order. Then, in boxes below the information on others' allocations you will be asked to enter the whole number of points (if any) that you wish to use to reduce the earnings of each individual (see below). Each point you allocate to reducing another's earnings **reduces your own earnings by 1 point and reduces that individual's earnings by 4 points**. Note that the ratio between the costs incurred by the person whose earnings are reduced and the costs to others (in this case, to the individual choosing to impose the reduction) is exactly the same as that in the "Group-determined fines" scheme—4:1. Your own earnings can be reduced in the same way by the decisions of others in your group. You are free to leave any or all others' earnings unchanged by entering 0's in the relevant boxes.

Period	6 out of 24	Remaining time [sec]: 59
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Allocation and deduction decisions	Your result	Other members' allocations to group account
Allocation to the group account:	<b>10</b>	<div style="display: flex; justify-content: space-around;"> <span>15</span> <span>12</span> <span>3</span> <span>7</span> </div> <div style="display: flex; justify-content: space-around;"> <input style="width: 80px; height: 30px;" type="text"/> <input style="width: 80px; height: 30px;" type="text"/> <input style="width: 80px; height: 30px;" type="text"/> <input style="width: 80px; height: 30px;" type="text"/> </div>
Your points for reduction:	-	
Your Earning in the current period	28.80	

Remember that the earnings of the group members are reduced by 4 times the amounts you enter.  
To leave an individual's earnings unchanged, enter 0.

OK

Note: Numbers shown are for illustration only.

Earnings reductions directed at you in stage 2 cannot bring your earnings for the period to less than zero. However, the cost of giving reductions to others is always fully born even if it makes your period earnings negative. (If you lose points in a period, they are deducted from those you accumulate in other periods.) Thus, your earnings in each period of this phase can be calculated as follows:

{The greater of  $[20 - (\text{points you allocate to group account}) + 0.4 * (\text{sum of points allocated by all in group to group account}) - 4 * (\text{sum of reduction points directed at you by others in your group})]$  and 0} - (points you use to reduce others' earnings).

For example, suppose that you use 0 points to reduce the earnings of the first and second individuals whose allocations appear on the screen, you use 1 point to reduce the earnings of the third, and you use 2 points to reduce the earnings of the fourth. Suppose further that these individuals use 0, 1, 0 and 3 points to reduce your earnings. Then the third and fourth individuals' earnings for the period will be reduced by 4 and by 8 points, respectively, in addition to any reductions due to the decisions of others, although these reductions cannot bring their earnings below zero. Your own earnings for the period will be reduced by 3 points, your cost to impose reductions on others, plus  $(1 \times 4) + (3 \times 4) = 16$  points, the reductions imposed on your earnings by others. At the end of the reduction stage, you will learn that others decided to reduce your earnings by a total of 16 points although your actual earnings reduction will be less if your allocation stage earnings are less than 16, but you will not be told which individuals reduced your earnings or by how much any given individual reduced your earnings. Others will also not know who in particular reduced their earnings and by how much.

In addition to the fact that earnings from the allocation stage and reductions received cannot go below zero, the earnings reduction process is subject to *two* limits. First, your reduction points must be an integer. Second, you cannot assign more than 10 reduction points to any one individual in your group.

Remember that if no reductions are imposed (the reduction boxes are filled in with 0's), earnings after the reduction stage are the same as those before it.

### **(3) Summary of phases 2 – 7**

The following is a summary of phases 2 – 7.

The 1st decision: At the beginning of the first period in every 4 period phase, you will vote on two schemes:

“Group-determined fines“ versus “Individual reduction decisions”

Whichever scheme gets the most votes ( $\geq 3$  votes) will be in effect for four periods.

#### **(i) When Group-determined fines is chosen**

In each period,

first, you will vote on whether it is allocations to the private account or to the group account that are subject to a fine.

Second, you will vote on the amount of the fine per point allocated to the account in question.

Third, under a chosen fine rule, you will make your decision on allocating points to your private or group account, and see earnings consequences along with fines and costs as well as the amount allocated to the group account by each of the others in your group in a random order.



Your group will vote on which allocation is subject to a fine and on the choice of fine rate in each of the four periods of each phase in which this scheme is used.

(ii) When Individual reduction decision is chosen

In each period,

first, you will make your decision on allocating points to your private or group account and see your earnings consequences along with the amount allocated to the group account by each of the others in your group in a random order.

Second, you will make a decision about whether to reduce the earnings of others or not and by what amount you reduce them if so. Each point you spend on reducing another's earnings reduces that person's earnings by four points.

Under both schemes, the earnings in a period due to the allocation stage and to any fines or reductions received cannot fall below zero. However, your share of the group cost of imposing fines, in Scheme (1), and your cost to reduce others' earnings, in Scheme (2), are born by you even if they cause your earnings in a given period to fall below zero, with the deduction coming from your accumulated earnings from other periods.

You will vote 6 times in total on the scheme to be used by your group—once for each of phases 2 – 7.

### *Comprehension questions*

Please answer the following questions. Raise your hand if you need help. A member of the experiment team will come to help you and will check your answers when you are done.

1. About voting between the two schemes:

- a) How many periods are left in the main portion of the experiment? \_\_\_\_\_
- b) How many times do you have the opportunity to vote on which scheme is used? \_\_\_\_\_
- c) If your group selects the scheme of group-determined fines in Phase 3 (that means, periods 10 – 13), can it select a different scheme in Phase 4 (that means, in periods 14 – 17)? \_\_\_\_\_

2. Suppose that the scheme of group-determined fines is in place.

a) Suppose the votes in your group are :

Step 1: Group, Private, Group, Private, Group

Which allocations are subject to a fine? Allocations to the \_\_\_\_\_ account

b) Suppose the votes in your group are:

Step 2: 0.4, 1.2, 0.8, 0.4, 0.8

What is the fine per point in your group? \_\_\_\_\_

- c) Suppose that your group votes to fine allocations to the private accounts at a rate of 1.2 points per point allocated, and suppose you allocate 15 points to the group account. How many points will you lose in the form of a fine\*? \_\_\_\_\_ points

\* Note: do not include your share of the cost of imposing this fine in your answer.

- d) Suppose that the fine scheme of c) is in place and that a group member allocates 20 points to the private account.

i) How much will that individual be fined? \_\_\_\_\_ points.

ii) What will be your share of the cost of imposing that fine? \_\_\_\_\_ points

3. Suppose that the scheme of individual reduction decisions is in place.

- a) How much does it cost you to reduce the earnings of another group member by 8 points?  
\_\_\_\_\_ points

- b) Suppose that an individual earns 10 points from the allocation stage, spends 2 points on reducing others' earnings, and incurs no earnings reductions from others. What are the individual's earnings for this period? \_\_\_\_\_ points

- c) Suppose that an individual earns 14 points from the allocation stage, spends 1 point on reducing others' earnings, and that others spend a total of 4 points to reduce her earnings. What are the individual's earnings for this period?  
\_\_\_\_\_

[In the **6-C** treatment, the experimenter began to read aloud the following instructions, of which the subjects also had printed copies:]

## Instructions for Phases 2 – 7

The next six phases each consist of 4 periods resembling period 1 of Phase 1. You will continue to interact with the same four individuals and in each period you will make a decision about allocating 20 points to either a private account or a group account, with the same immediate payment consequence (you earn 1 point for each point you allocate to your private account, and each group member earns 0.4 points for each point you or another member allocates to the group account). However, there will be no additional periods in which earnings are affected by the conditional allocation schedule you completed in Phase 1. Moreover, each period will now include a second stage in which your earnings from the first stage may be altered. There are two possible schemes governing the second stage of each period, which will be explained to you in these instructions. At the beginning of each phase, your group will determine by majority vote which of the two schemes will be used during the four periods of that phase. You can select different schemes in different phases. At the end of these six phases (24 periods), the main part of today's experiment will be over.

Your allocation decision in stage 1 of each period is exactly as before, so we will focus now on the two schemes one of which you will choose to have in place for the second stage of each period.

Of the two possible schemes that your group may choose from, one is a scheme in which the group votes on the rules of a fine (which will be referred to on the voting screen as “**Group-determined fines**”); the other is a scheme in which individuals can reduce others' earnings after learning of their allocations (which will be referred to on the voting screen as “**Individual reduction decisions**”).

### **Scheme (1): Group-determined fines**

In this scheme, earnings from the allocation stage can be reduced by a *fine rule* that your group chooses by voting *at the beginning of each period*. When a rule is in place, the fines specified are automatically imposed when triggered by an allocation decision, as explained presently.

A fine rule consists of two parts. The first part is a decision on whether it is allocations to the **private** account or to the **group** account that are subject to a fine. The second part is a decision on the amount of the **fine per point** allocated to the account in question. Possible fine rates are 0, 0.4, 0.8 and 1.2 points per point allocated.

For each point that is lost by a subject who is fined, the group also incurs a cost of **1/3** point to impose that fine. For example, if an individual is fined a total of 3 points, this costs the group 1 point, with each group member (including the fine recipient) being charged 0.2 points (1/5 of 1 point) as his or her share of that cost. More generally, for each 1 point of fines imposed on any group member, each group member pays  $(1/3) \cdot (1/5) =$  one fifteenth of a point as his or her per capita cost of imposing the fine. In the example of an individual fined 3 points, that individual thus loses both the 3 points and his or her per capita share of the cost, 0.2 points, for a total loss of 3.2 points. Notice that since the person fined loses a total of 3.2 points while the other four

group members pay 0.8 points in the aggregate (i.e.,  $4 \times 0.2$ ), the ultimate cost ratio is 4:1 (3.2:0.8).

In addition to the fines dependent on a rule that your group chooses, at the end of a period, a fixed cost of 5 points is also deducted from the earnings of each group member. This can be thought of as the fixed administrative cost of having a fine scheme in operation, a cost that doesn't depend on how frequently or infrequently fines are in fact imposed.

Fines in the present stage cannot bring an individual's earnings for a period to less than zero. However, the per capita share of the cost of imposing fines *is* always fully born, even if it brings one's earnings for the period to less than zero. (If you lose points in a period, they are deducted from those you accumulate in other periods.) Once a fine rule is decided, you make an allocation decision, given your endowment of 20.

Your earnings can be thought of as having two parts:

**Part 1:** Earnings from the allocation stage minus your fine, or 0 if the latter is negative  
-- minus --

**Part 2:** Your part of the cost of administering the fine scheme = fixed cost of 5 points + your per capita share of  $(1/3) \times \text{total fines imposed} = 5 + (1/15) \times (\text{total fines imposed})$ .

Note that you incur the cost of Part 2 even if it causes your net earnings for the period to be negative.

Restated, your earnings are:

{the greater of  $[20 - (\text{points you allocate to group account}) + 0.4 \times (\text{sum of points allocated by all group members to group account}) - \text{the fine paid by you}]$  and 0}  
-  $[5 \text{ points} + (1/15) \times (\text{total fines imposed})]$

Your group selects which allocations are subject to fine by majority vote (3 votes or more). The fine rate selected will be the median of the preferred levels entered by individual group members. For example, if individuals enter choices of 0, 0, 0.4, 0.4 and 1.2 as their preferred fine rates, the group's choice is 0.4. If choices entered are 0, 0, 0, 0.8 and 1.2, the group's choice is 0.

Note that there is effectively no fine if your group chooses a fine rate of 0, although earnings in this phase will nevertheless differ from those in Phase 1 due to the 5 point fixed administrative charge that is deducted from each individual's earnings at the end of each period. Also, if the fine rate is positive, only the 5 point fixed administrative charge may be deducted from each individual's earnings at the end of a period if no member allocates points to the account that is subject to a fine.

In each period of this phase, your group will first vote on which account (**group** or **private**) will be subject to a fine. You will then see a report regarding which option was chosen, and will vote on the fine rate. You will know both parts of the rule before making your decision on allocating points to your private or group account.

## Scheme (2): Individual reduction decisions

In this scheme, you have an opportunity in stage 2 of each period to reduce the earnings of others in your group at a cost to your own earnings. After you and others in your group make an allocation decision, you will see your earnings in the allocation stage and the amount allocated to the group account by each of the others in your group in a random order. Then, in boxes below the information on others' allocations you will be asked to enter the whole number of points (if any) that you wish to use to reduce the earnings of each individual (see below). Each point you allocate to reducing another's earnings **reduces your own earnings by 1 point** and **reduces that individual's earnings by 4 points**. Note that the ratio between the costs incurred by the person whose earnings are reduced and the costs to others (in this case, to the individual choosing to impose the reduction) is exactly the same as that in the "Group-determined fines" scheme—4:1. Your own earnings can be reduced in the same way by the decisions of others in your group. You are free to leave any or all others' earnings unchanged by entering 0's in the relevant boxes.

Period

6 out of 24

Remaining time [sec]: 59

Allocation and deduction decisions	Your result	Other members' allocations to group account
Allocation to the group account:	10	15    12    3    7
Your points for reduction:	-	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Your Earning in the current period	28.80	

Remember that the earnings of the group members are reduced by 4 times the amounts you enter.  
To leave an individual's earnings unchanged, enter 0.

OK

Note: Numbers shown are for illustration only.

Earnings reductions directed at you in stage 2 cannot bring your earnings for the period to less than zero. However, the cost of giving reductions to others is always fully born even if it makes your period earnings negative. (If you lose points in a period, they are deducted from those you accumulate in other periods.) Thus, your earnings can be thought of as having two parts:

**Part 1:** Earnings from the allocation stage minus reductions by others in your group, or 0 if the latter is negative

-- minus --

**Part 2:** Points you use to reduce others' earnings

Note that you incur the cost in Part 2 even if it causes your net earnings for the period to be negative.

Restated, your earnings are:

{the greater of  $[20 - (\text{points you allocate to group account}) + 0.4 * (\text{sum of points allocated by all in group to group account}) - 4 * (\text{sum of reduction points directed at you by others in your group})]$  and 0} - points you use to reduce others' earnings.

For example, suppose that you use 0 points to reduce the earnings of the first and second individuals whose allocations appear on the screen, you use 1 point to reduce the earnings of the third, and you use 2 points to reduce the earnings of the fourth. Suppose further that these individuals use 0, 1, 0 and 3 points to reduce your earnings. Then the third and fourth individuals' earnings for the period will be reduced by 4 and by 8 points, respectively, in addition to any reductions due to the decisions of others, although these reductions cannot bring their earnings below zero. Your own earnings for the period will be reduced by 3 points, your cost to impose reductions on others, plus  $(1 \times 4) + (3 \times 4) = 16$  points, the reductions imposed on your earnings by others. At the end of the reduction stage, you will learn that others decided to reduce your earnings by a total of 16 points although your actual earnings reduction will be less if your allocation stage earnings are less than 16, but you will not be told which individuals reduced your earnings or by how much any given individual reduced your earnings. Others will also not know who in particular reduced their earnings and by how much.

In addition to the fact that earnings from the allocation stage and reductions received cannot go below zero, the earnings reduction process is subject to *two* limits. First, your reduction points must be an integer. Second, you cannot assign more than 10 reduction points to any one individual in your group.

Remember that if no reductions are imposed (the reduction boxes are filled in with 0's), earnings after the reduction stage are the same as those before it.

### (3) Summary of phases 2 – 7

The following is a summary of phases 2 – 7.

The 1st decision: At the beginning of the first period in every 4 period phase, you will vote on two schemes:

“Group-determined fines” versus “Individual reduction decisions”

Whichever scheme gets the most votes ( $\geq 3$  votes) will be in effect for four periods.

(i) When Group-determined fines is chosen

In each period,

first, you will vote on whether it is allocations to the **private account** or to the **group account** that are subject to a fine.

Second, you will vote on the amount of the fine per point allocated to the account in question.

Third, under a chosen fine rule, you will make your decision on allocating points to your private or group account, and see earnings consequences along with fines and costs as well as the amount allocated to the group account by each of the others in your group in a random order. Your group will vote on which allocation subject to a fine and on the choice of fine rate in each of the four periods of each phase in which this scheme is used.

(ii) When Individual reduction decision is chosen

In each period,

first, you will make your decision on allocating points to your private or group account and see your earnings consequences along with the amount allocated to the group account by each of the others in your group in a random order.

Second, you will make a decision about whether to reduce the earnings of others or not and by what amount you reduce them if so. Each point you spend on reducing another's earnings reduces that person's earnings by four points.

Under both schemes, the earnings in a period due to the allocation stage and to any fines or reductions received cannot fall below zero. However, your share of the group cost of imposing fines, in Scheme (1), and your cost to reduce others' earnings, in Scheme (2), are born by you even if they cause your earnings in a given period to fall below zero, with the deduction coming from your accumulated earnings from other periods.

You will vote 6 times in total on the scheme to be used by your group—once for each of phases 2 – 7.

### *Comprehension questions*

Please answer the following questions. Raise your hand if you need help. A member of the experiment team will come to help you and will check your answers when you are done.

**1. About voting between the two schemes:**

a) How many periods are left in the main portion of the experiment? \_\_\_\_\_

b) How many times do you have the opportunity to vote on which scheme is used?  
\_\_\_\_\_

c) If your group selects the scheme of group-determined fines in Phase 3 (that means, periods 10 – 13), can it select a different scheme in Phase 4 (that means, in periods 14 – 17)?  
\_\_\_\_\_

2. Suppose that the scheme of group-determined fines is in place.

a) What is the fixed charge each period for operating the fine scheme? \_\_\_\_\_  
(Remember that this charge is deducted from earnings at the end of the period, so you still have 20 points to allocate to your group and private accounts.)

b) Suppose the votes in your group are :  
Step 1: Group, Private, Group, Private, Group

Which allocations are subject to a fine? Allocations to the \_\_\_\_\_ account

c) Suppose the votes in your group are:  
Step 2: 0.4, 1.2, 0.8, 0.4, 0.8

What is the fine per point in your group? \_\_\_\_\_

d) Suppose that your group votes to fine allocations to the private accounts at a rate of 1.2 points per point allocated, and suppose you allocate 15 points to the group account. How many points will you lose in the form of a fine\*? \_\_\_\_\_ points

\* Note: do not include your share of the cost of imposing this fine in your answer.

e) Suppose that the fine scheme of d) is in place and that a group member allocates 20 points to the private account.

i) How much will that individual be fined? \_\_\_\_\_ points.

ii) What will be your share of the cost of imposing that fine? \_\_\_\_\_ points

3. Suppose that the scheme of individual reduction decisions is in place.

a) How much does it cost you to reduce the earnings of another group member by 8 points?  
\_\_\_\_\_points

b) Suppose that an individual earns 10 points from the allocation stage, spends 2 points on reducing others' earnings, and incurs no earnings reductions from others. What are the individual's earnings for this period? \_\_\_\_\_points

c) Suppose that an individual earns 14 points from the allocation stage, spends 1 point on reducing others' earnings, and that others spend a total of 4 points to reduce her earnings. What are the individual's earnings for this period?  
\_\_\_\_\_



[In both in the **6-N** and **6-C** treatments, then, experimenter said: “If you have any questions about phases 2 – 7, please raise your hand. If not, we’ll begin Phase 2 now.”]

## **A.2. Intelligence test**

[After Phase 6 (7) of the main part of experiments in the BASELINE and 3-Vote treatments (6-Vote treatment), the following instructions were read:]

“We will now hand out and read the instructions for the second part of today’s experiments. As before, you are not allowed to communicate with other participants during this portion of the experiment.”

Then the experimenter began to read aloud the following instructions, of which the subjects also had printed copies:

# **Instructions**

In this experiment you will have to solve 15 tasks in which you can earn points (34points = \$1.00). Each task consists of a series of symbols and you are required to find the symbol that would come next in the series.

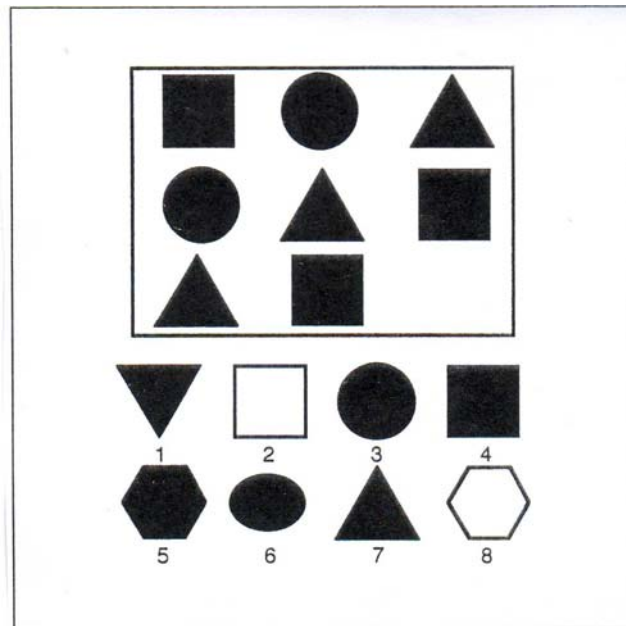
For each task you can choose between 8 possible symbols. Once you have located the symbol you think should be the next in the series, you indicate the number on your screen and continue to the next task. Once an answer is submitted you cannot go back and change your answer. All questions must be answered. If you fail to answer a question and confirm your answer within 40 seconds, this question will be counted as a wrong answer. You will have 40 seconds to solve each question before continuing to the next task.

### *How to calculate your earnings*

Your earnings depend on your answers. For each right answer you earn 15 points, for each wrong answer you lose 3 points.

### *Example of a question*

This is an example of a question. The correct answer is symbol 3. There has to be a square, a circle and a triangle in each line. In line three there is a triangle and a square but it is missing a circle and therefore symbol 3 is the correct answer.



[When there was no question, experiment teams started to hand out the questions for the test. Then, the experimenter said: "Please turn over your questionnaire and begin."]

### **A.3. Political Questionnaire, Exit and Open-ended questions**

[After the intelligence test the following instructions were read:]

This is the final task for today. Please listen to the instructions before beginning to answer the questions on your computer screen. In the following you are asked to indicate your views on various issues. How would you place your views on a scale from 1 to 10? 1 means you agree completely with the statement written on the left side of the screen; 10 means you agree completely with the statement on the right side of the screen; and if your views fall somewhere in between, you can choose any number in between, but, you can only choose integers between 1 and 10. There are no right or wrong answers to these questions, and your earnings in today's experiment are unaffected by how you answer. Please indicate in the white box on the left of your screen the number you choose and continue to the next question. There are in all 10 questions. Once a question is submitted you cannot go back and change your answer. All questions must be answered. If you have any questions please raise your hand and we will come and help you. You are still not allowed to communicate with other participants. Once you have

finished the questionnaire you will be asked a few last questions about your semester level, economics course experience, concentration, nationality and gender. After you have done this, your exact earnings will be calculated and shown to you. Then there will be a few open-ended questions to get your feedback about today's experiment while we prepare to give you your earnings. Any questions? Please begin.

[The following is the list of political survey questions and additional questions:]

### Points of view

We'd like you to tell us your views on various issues. How would you place your views on each of the scales below? Circle 1 if you agree completely with the position or statement on the left; circle 10 if you agree completely with the position or statement on the right; and if your views fall somewhere in between, you can circle any number in between. Select only one number for each issue.

Income should be made more equal

1      2      3      4      5      6

We need larger income differences as incentives for individual efforts

7      8      9      10

Private ownership of business and industry should be increased

1      2      3      4      5      6

Government ownership of business and industry should be increased

7      8      9      10

The government should take more responsibility to ensure that everyone is provided for

1      2      3      4      5      6

People should take more responsibility to provide for themselves

7      8      9      10

Competition is good. It stimulates people to work hard and develop new ideas

1      2      3      4      5      6

Competition is harmful. It brings out the worst in people

7      8      9      10

In the long run, hard work usually brings a better life

1      2      3      4      5      6

Hard work doesn't generally brings success – it's more a matter of luck and connections

7      8      9      10

People can only get rich At the expense of others

1      2      3      4      5      6

Wealth can grow so there's enough for everyone

7      8      9      10

In political matters, people talk of “the left” and “the right.” How would you place your views on this scale, generally speaking?

		Left						Right	
1	2	3	4	5	6	7	8	9	10

Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair? Please show your response in the spectrum between 0 and 10, where 1 means that “people would try to take advantage of you,” and 10 means that “people would try to be fair”

People would try to take advantage of you								People would try to be fair	
1	2	3	4	5	6	7	8	9	10

How important is it for you to live in a country that is governed democratically? On this scale where 1 means it is “not at all important” and 10 means “absolutely important” what position would you choose?

Not at all important								Absolutely important	
1	2	3	4	5	6	7	8	9	10

For the following organizations, how much confidence do you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence or none at all?

- |   |             |               |             |
|---|-------------|---------------|-------------|
| 1) The police                               |             |               |             |
| A great deal                                | Quite a lot | Not very much | None at all |
| 1   | 2           | 3             | 4           |
| 2) The courts                               |             |               |             |
| A great deal                                | Quite a lot | Not very much | None at all |
| 1   | 2           | 3             | 4           |
| 3) The government                           |             |               |             |
| A great deal                                | Quite a lot | Not very much | None at all |
| 1   | 2           | 3             | 4           |
| 4) Charitable or humanitarian organizations |             |               |             |
| A great deal                                | Quite a lot | Not very much | None at all |
| 1   | 2           | 3             | 4           |

### Exit Question

- 1) Please indicate your concentration or concentrations.
- 2) How many semesters of college or university have you completed?
- 3) How many economics courses have you taken?
- 4) What is your nationality?
- 5) Gender

### **Open-ended Question in the BASELINE treatment**

- 1) Please explain briefly what your strategy was in deciding how much to allocate to your group account.
- 2) Were you surprised by decisions that other group members made?
- 3) Did your strategy change much over time, and if so how and why?
- 4) Were the instructions clear enough?

### **Open-ended Question in the 3-Vote treatment**

- 1) Please explain briefly what your strategy was in deciding how much to allocate to your group account.
- 2) Please explain briefly your votes between the scheme of group-determined fines and the scheme of individual reduction decisions. Did your voting choices change much over time, and if so how and why?
- 3) When the scheme of group-determined fines was in place, on what basis did you decide how to vote regarding (a) whether allocations to the private or to the group account should be fined? (b) what the per unit fine rate should be?
- 4) When the scheme of individual reduction decisions was in place, how did you decide whose earnings, if any, to reduce?
- 5) Were the instructions clear enough?

### **Open-ended Question in the 6-Vote treatment**

- 1) Please explain briefly what your strategy was in deciding how much to allocate to your group account.
- 2) Please explain briefly your votes between the scheme of group-determined fines and the scheme of individual reduction decisions. Did your voting choices change much over time, and if so how and why?
- 3) When your group chose the group-determined fines, what kinds of strategies did you choose in deciding what to vote for in the fine scheme? (If your group never chose this scheme, please leave this question blank.)
- 4) When your group chose the individual reduction scheme, how did you decide whose earnings, if any, to reduce? (If your group never chose this scheme, please leave this question blank.)
- 5) Were the instructions clear enough?

## Appendix B: Additional Tables and Figures

**Table B.1:** Results of voting choice (account to be fined, fine rate) under formal scheme

(a) 3(FI)-N treatment

Phase	Period	Group 9			Group 10			Group 11			Group 12		
		Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate
2	5	-----	Private	1.2	-----	Private	1.2	-----	Private	1.2	-----	Private	0.8
	6		Private	1.2		Private	1.2		Private	1.2		Private	1.2
	7		Private	1.2		Private	1.2		Private	1.2		Private	1.2
	8		Private	1.2		Private	1.2		Private	0.8		Private	1.2
4	13	Formal	Private	1.2	Formal	Private	1.2	Informal	----	----	Formal	Private	1.2
	14		Private	1.2		Private	1.2		----	----		Private	1.2
	15		Private	1.2		Private	1.2		----	----		Private	1.2
	16		Private	1.2		Private	1.2		----	----		Private	1.2
5	17	Formal	Private	1.2	Formal	Private	1.2	Informal	----	----	Formal	Private	1.2
	18		Private	0.0		Private	1.2		----	----		Private	1.2
	19		Private	1.2		Private	1.2		----	----		Private	1.2
	20		Private	1.2		Private	1.2		----	----		Private	1.2
6	21	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2
	22		Private	1.2		Private	1.2		Private	1.2		Private	1.2
	23		Private	0.0		Private	1.2		Private	1.2		Private	0.8
	24		Private	1.2		Private	1.2		Private	1.2		Private	1.2

Phase	Period	Group 13			Group 14			Group 15		
		Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate
2	5	-----	Private	1.2	-----	Private	0.4	-----	Private	1.2
	6		Private	1.2		Private	1.2		Private	1.2
	7		Private	1.2		Private	1.2		Private	1.2
	8		Private	1.2		Private	1.2		Private	1.2
4	13	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2
	14		Private	1.2		Private	1.2		Private	1.2
	15		Private	1.2		Private	1.2		Private	1.2
	16		Private	1.2		Private	1.2		Private	1.2
5	17	Formal	Private	1.2	Informal	----	----	Formal	Private	1.2
	18		Private	1.2		----	----		Private	1.2
	19		Private	1.2		----	----		Private	1.2
	20		Private	1.2		----	----		Private	1.2
6	21	Informal	----	----	Informal	----	----	Formal	Private	1.2
	22		----	----		----	----		Private	1.2
	23		----	----		----	----		Private	1.2
	24		----	----		----	----		Private	1.2

## (b) 3(IF)-N treatment

Phase	Period	Group 16			Group 17			Group 18			Group 19		
		Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate
3	9	-----	Private	0.4	-----	Private	1.2	-----	Private	0.8	-----	Private	1.2
	10		Private	0.4		Private	1.2		Private	0.8		Private	1.2
	11		Private	0.8		Private	1.2		Private	1.2		Private	1.2
	12		Public	0.0		Private	1.2		Private	1.2		Private	1.2
4	13	Formal	Public	0.0	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2
	14		Public	0.0		Private	1.2		Private	1.2		Private	1.2
	15		Public	0.0		Private	1.2		Private	1.2		Private	1.2
	16		Private	0.4		Private	1.2		Private	1.2		Private	1.2
5	17	Formal	Public	0.0	Formal	Private	1.2	Formal	Private	1.2	Informal	----	----
	18		Public	0.0		Private	1.2		Private	1.2		----	----
	19		Public	0.0		Private	1.2		Private	1.2		----	----
	20		Public	0.0		Private	1.2		Private	1.2		----	----
6	21	Informal	----	----	Formal	Private	1.2	Formal	Private	0.0	Formal	Private	1.2
	22		----	----		Private	1.2		Private	1.2		Private	1.2
	23		----	----		Private	1.2		Private	1.2		Private	1.2
	24		----	----		Private	1.2		Private	1.2		Private	1.2

Phase	Period	Group 20			Group 21			Group 22			Group 23		
		Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate
3	9	-----	Private	1.2	-----	Private	1.2	-----	Private	0.8	-----	Private	1.2
	10		Private	1.2		Private	1.2		Private	1.2		Private	1.2
	11		Private	1.2		Private	1.2		Private	1.2		Private	1.2
	12		Private	1.2		Private	1.2		Private	1.2		Private	1.2
4	13	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2
	14		Private	1.2		Private	1.2		Private	1.2		Private	1.2
	15		Private	1.2		Private	1.2		Private	1.2		Private	1.2
	16		Private	1.2		Private	1.2		Private	1.2		Private	1.2
5	17	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2
	18		Private	1.2		Private	1.2		Private	1.2		Private	1.2
	19		Private	1.2		Private	1.2		Private	1.2		Private	1.2
	20		Private	1.2		Private	1.2		Private	1.2		Private	1.2
6	21	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2
	22		Private	1.2		Private	1.2		Private	1.2		Private	1.2
	23		Private	1.2		Private	1.2		Private	1.2		Private	1.2
	24		Private	1.2		Private	1.2		Private	1.2		Private	1.2

(c) 3(FI)-C treatment

Group 24					Group 25			Group 26			Group 27		
Phase	Period	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate
2	5	-----	Private	0.8	-----	Private	1.2	-----	Private	0.8	-----	Private	1.2
	6		Private	0.0		Private	1.2		Private	1.2		Private	1.2
	7		Private	0.8		Private	1.2		Private	1.2		Private	1.2
	8		Private	0.8		Private	1.2		Private	1.2		Private	1.2
4	13	Informal	----	----	Informal	----	----	Informal	----	----	Informal	----	----
	14		----	----		----	----		----	----		----	----
	15		----	----		----	----		----	----		----	----
	16		----	----		----	----		----	----		----	----
5	17	Informal	----	----	Informal	----	----	Informal	----	----	Informal	----	----
	18		----	----		----	----		----	----		----	----
	19		----	----		----	----		----	----		----	----
	20		----	----		----	----		----	----		----	----
6	21	Formal	Private	0.0	Informal	----	----	Informal	----	----	Informal	----	----
	22		Private	0.8		----	----		----	----		----	----
	23		Private	0.8		----	----		----	----		----	----
	24		Private	0.4		----	----		----	----		----	----

Group 28					Group 29			Group 30			Group 31		
Phase	Period	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate
2	5	-----	Private	1.2	-----	Private	1.2	-----	Private	1.2	-----	Private	0.8
	6		Private	1.2		Private	1.2		Private	1.2		Private	1.2
	7		Private	1.2		Private	1.2		Private	1.2		Private	1.2
	8		Private	1.2		Private	1.2		Private	1.2		Private	1.2
4	13	Formal	Private	1.2	Informal	----	----	Informal	----	----	Formal	Private	1.2
	14		Private	1.2		----	----		----	----		Private	1.2
	15		Private	1.2		----	----		----	----		Private	1.2
	16		Private	1.2		----	----		----	----		Private	1.2
5	17	Formal	Private	1.2	Informal	----	----	Informal	----	----	Informal	----	----
	18		Private	1.2		----	----		----	----		----	----
	19		Private	1.2		----	----		----	----		----	----
	20		Private	1.2		----	----		----	----		----	----
6	21	Formal	Private	1.2	Informal	----	----	Informal	----	----	Informal	----	----
	22		Private	1.2		----	----		----	----		----	----
	23		Private	1.2		----	----		----	----		----	----
	24		Private	1.2		----	----		----	----		----	----



(d) 3(IF)-C treatment

Phase	Period	Group 32			Group 33			Group 34			Group 35		
		Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate
3	9	-----	Private	0.4	-----	Private	0.4	-----	Private	0.8	-----	Private	1.2
	10		Private	0.4		Private	0.4		Private	0.8		Private	1.2
	11		Private	0.4		Private	0.4		Private	0.8		Private	1.2
	12		Private	1.2		Private	0.8		Private	0.8		Private	1.2
4	13	Informal	----	----	Formal	Private	0.8	Formal	Private	1.2	Informal	----	----
	14		----	----		Private	0.8		Private	1.2		----	----
	15		----	----		Private	0.8		Private	1.2		----	----
	16		----	----		Private	0.8		Private	1.2		----	----
5	17	Informal	----	----	Informal	----	----	Informal	----	----	Informal	----	----
	18		----	----		----	----		----	----		----	----
	19		----	----		----	----		----	----		----	----
	20		----	----		----	----		----	----		----	----
6	21	Informal	----	----	Informal	----	----	Informal	----	----	Informal	----	----
	22		----	----		----	----		----	----		----	----
	23		----	----		----	----		----	----		----	----
	24		----	----		----	----		----	----		----	----

Phase	Period	Group 36			Group 37			Group 38			Group 39		
		Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate
3	9	-----	Private	0.8	-----	Private	1.2	-----	Private	0.0	-----	Private	0.8
	10		Private	0.8		Private	1.2		Private	1.2		Private	0.4
	11		Private	1.2		Private	1.2		Private	1.2		Private	1.2
	12		Private	1.2		Private	1.2		Private	1.2		Private	0.0
4	13	Informal	----	----	Informal	----	----	Informal	----	----	Formal	Private	0.8
	14		----	----		----	----		----	----		Private	0.4
	15		----	----		----	----		----	----		Private	1.2
	16		----	----		----	----		----	----		Private	1.2
5	17	Informal	----	----	Informal	----	----	Informal	----	----	Formal	Private	1.2
	18		----	----		----	----		----	----		Private	0.8
	19		----	----		----	----		----	----		Private	1.2
	20		----	----		----	----		----	----		Private	1.2
6	21	Informal	----	----	Informal	----	----	Informal	----	----	Formal	Private	1.2
	22		----	----		----	----		----	----		Private	1.2
	23		----	----		----	----		----	----		Private	1.2
	24		----	----		----	----		----	----		Private	0.0

## (e) 6-N treatment

Phase	Period	Group 40			Group 41			Group 42		
		Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate
2	2	Formal	Private	0.0	Formal	Private	0.8	Formal	Private	0.0
	3		Private	0.0		Private	1.2		Private	0.0
	4		Private	0.4		Private	1.2		Private	0.4
	5		Private	1.2		Private	1.2		Private	0.0
3	6	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2
	7		Private	1.2		Private	1.2		Private	1.2
	8		Private	1.2		Private	1.2		Private	1.2
	9		Private	1.2		Private	1.2		Private	1.2
4	10	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2
	11		Private	1.2		Private	1.2		Private	1.2
	12		Private	1.2		Private	1.2		Private	1.2
	13		Private	1.2		Private	1.2		Private	1.2
5	14	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2
	15		Private	1.2		Private	1.2		Private	1.2
	16		Private	1.2		Private	1.2		Private	1.2
	17		Private	1.2		Private	1.2		Private	1.2
6	18	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2
	19		Private	1.2		Private	1.2		Private	1.2
	20		Private	1.2		Private	1.2		Private	1.2
	21		Private	1.2		Private	1.2		Private	1.2
7	22	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2
	23		Private	1.2		Private	1.2		Private	1.2
	24		Private	1.2		Private	1.2		Private	1.2
	25		Private	1.2		Private	1.2		Private	1.2

Phase	Period	Group 43			Group 44			Group 45			Group 46		
		Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate
2	2	Formal	Private	1.2	Formal	Private	0.4	Formal	Private	1.2	Formal	Private	0.0
	3		Private	0.0		Private	0.4		Private	1.2		Private	0.0
	4		Private	1.2		Private	0.8		Private	1.2		Private	0.0
	5		Private	1.2		Private	1.2		Private	1.2		Private	0.0
3	6	Formal	Private	1.2	Formal	Private	1.2	Formal	Public	0.0	Informal	----	----
	7		Private	1.2		Private	1.2		Private	1.2		----	----
	8		Private	1.2		Private	1.2		Private	1.2		----	----
	9		Private	1.2		Private	1.2		Private	1.2		----	----
4	10	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2	Informal	----	----
	11		Private	1.2		Private	1.2		Private	1.2		----	----
	12		Private	1.2		Private	1.2		Private	1.2		----	----
	13		Private	1.2		Private	1.2		Private	1.2		----	----
5	14	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2	Informal	----	----
	15		Private	1.2		Private	1.2		Private	1.2		----	----
	16		Private	1.2		Private	1.2		Private	1.2		----	----
	17		Private	1.2		Private	1.2		Private	1.2		----	----
6	18	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2	Informal	----	----
	19		Private	1.2		Private	1.2		Private	1.2		----	----
	20		Private	1.2		Private	1.2		Private	1.2		----	----
	21		Private	1.2		Private	1.2		Private	1.2		----	----
7	22	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2	Informal	----	----
	23		Private	1.2		Private	1.2		Private	1.2		----	----
	24		Private	1.2		Private	1.2		Private	1.2		----	----
	25		Private	1.2		Private	1.2		Private	1.2		----	----

## (f) 6-C treatment

Phase	Period	Group 47			Group 48			Group 49			Group 50		
		Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate
2	2	Informal	----	----	Informal	----	----	Informal	----	----	Informal	----	----
	3		----	----		----	----		----	----		----	----
	4		----	----		----	----		----	----		----	----
	5		----	----		----	----		----	----		----	----
3	6	Informal	----	----	Informal	----	----	Informal	----	----	Formal	Private	0.4
	7		----	----		----	----		----	----		Private	0.4
	8		----	----		----	----		----	----		Private	0.8
	9		----	----		----	----		----	----		Private	1.2
4	10	Informal	----	----	Informal	----	----	Informal	----	----	Informal	----	----
	11		----	----		----	----		----	----		----	----
	12		----	----		----	----		----	----		----	----
	13		----	----		----	----		----	----		----	----
5	14	Informal	----	----	Informal	----	----	Informal	----	----	Informal	----	----
	15		----	----		----	----		----	----		----	----
	16		----	----		----	----		----	----		----	----
	17		----	----		----	----		----	----		----	----
6	18	Informal	----	----	Informal	----	----	Informal	----	----	Informal	----	----
	19		----	----		----	----		----	----		----	----
	20		----	----		----	----		----	----		----	----
	21		----	----		----	----		----	----		----	----
7	22	Informal	----	----	Informal	----	----	Informal	----	----	Informal	----	----
	23		----	----		----	----		----	----		----	----
	24		----	----		----	----		----	----		----	----
	25		----	----		----	----		----	----		----	----

Phase	Period	Group 51			Group 52			Group 53			Group 54		
		Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate	Formal or Informal	Public or Private	fine rate
2	2	Informal	----	----	Informal	----	----	Formal	Private	1.2	Formal	Private	0.4
	3		----	----		----	----		Private	0.8		Private	0.4
	4		----	----		----	----		Private	1.2		Private	0.4
	5		----	----		----	----		Private	1.2		Private	0.4
3	6	Informal	----	----	Formal	Public	0.0	Formal	Private	1.2	Formal	Private	0.4
	7		----	----		Public	0.0		Private	1.2		Private	0.4
	8		----	----		Public	0.0		Private	1.2		Private	0.4
	9		----	----		Private	0.4		Private	1.2		Private	0.4
4	10	Informal	----	----	Informal	----	----	Formal	Private	1.2	Formal	Private	0.4
	11		----	----		----	----		Private	1.2		Private	0.4
	12		----	----		----	----		Private	1.2		Private	0.4
	13		----	----		----	----		Private	1.2		Private	0.4
5	14	Informal	----	----	Formal	Private	0.0	Formal	Private	1.2	Formal	Private	0.4
	15		----	----		Private	0.8		Private	1.2		Private	0.4
	16		----	----		Private	1.2		Private	1.2		Private	0.8
	17		----	----		Private	1.2		Private	1.2		Private	1.2
6	18	Informal	----	----	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2
	19		----	----		Private	1.2		Private	1.2		Private	1.2
	20		----	----		Private	1.2		Private	1.2		Private	1.2
	21		----	----		Private	1.2		Private	1.2		Private	1.2
7	22	Informal	----	----	Formal	Private	1.2	Formal	Private	1.2	Formal	Private	1.2
	23		----	----		Private	1.2		Private	1.2		Private	1.2
	24		----	----		Private	1.2		Private	1.2		Private	1.2
	25		----	----		Private	1.2		Private	1.2		Private	1.2

### Notes on Voting on formal scheme parameters in Section 4.3

(a) For exogenous formal scheme only:

In the 3-Vote treatment, there were 124 periods in which groups voted on the parameters of an exogenous formal sanction scheme (phase 2 or 3), with 620 individual votes on whether to penalize contributions to the private or public account and the same number of individual votes for penalty rate 0.0, 0.4, 0.8 or 1.2 per point assigned to the account selected. Only 1 out of 124 group votes selected to penalize allocations to the public accounts (see Appendix Table B1). A total of 34 out of the 155 subjects (21.9%) who had four opportunities to vote on the issue voted one or more times to penalize allocations to the public accounts, with 12.6% of individual votes (78 votes) cast being for this inefficient option.

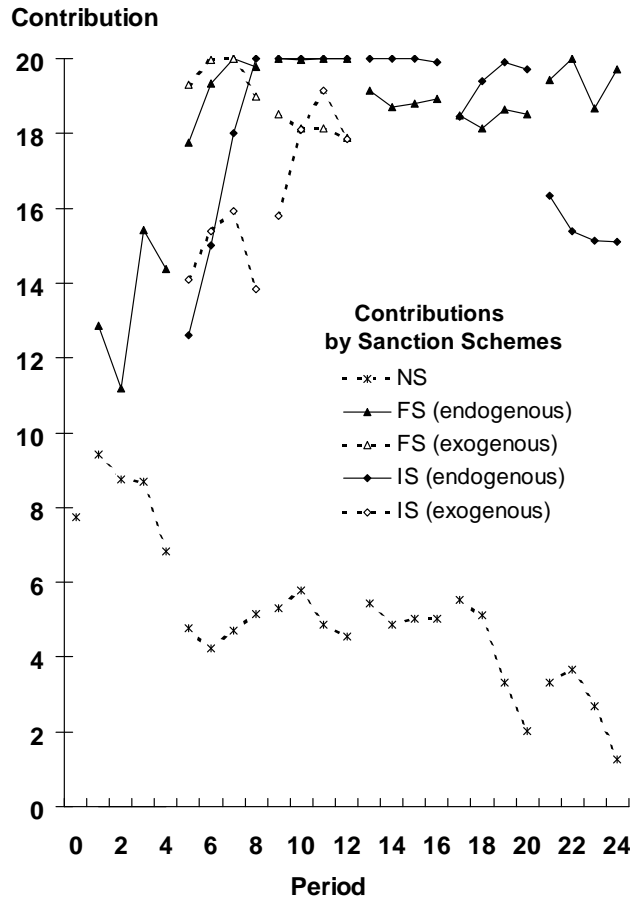
Following the 123 group votes for penalty rates under the rule of penalizing allocations to the private accounts, 27 groups chose penalty rate 1.2 (in total, 91 votes), 12 rate 0.8 (in total 19 votes), so that in 89.4 % of the 123 cases (88.7 % of the 124 group-periods with exogenous formal sanctions) a binding, efficient sanction was put in place. The non-binding 0.4 rate was selected in 10 cases, 0.0 in 3. Of the individual votes under exogenous formal sanctions for contributing to the private accounts (615 votes), 390 (63.4 %) were for 1.2, 60 (9.8 %) for 0.8, 43 (7.0 %) for 0.4 and 122 (19.8 %) for 0.0.

(b) For endogenous formal scheme only:

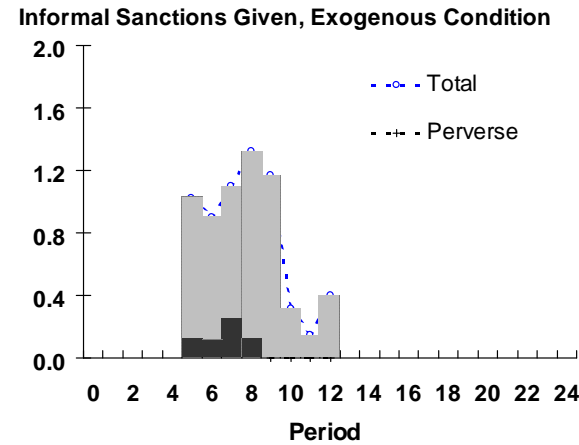
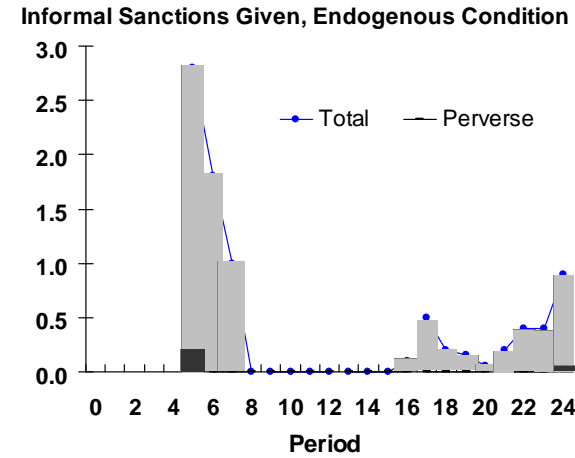
With 102 group votes in favor of formal sanctions, there were 408 periods in which groups voted on the parameters of a formal sanction scheme, with 2,040 individual votes on whether to penalize contributions to the private or public account and the same number of individual votes for penalty rate 0.0, 0.4, 0.8 or 1.2 per point assigned to the account selected. Only 11 out of 408 group votes selected to penalize allocations to the public accounts, and these inefficient choices were made by just 3 out of the 31 groups that chose to use formal sanctions some time in their session (see Appendix Table B1). A total of 49 out of the 160 subjects (31%) who had at least four opportunities to vote on the issue voted one or more times to penalize allocations to the public accounts, with 13.6% of individual votes (277 votes) cast being for this inefficient option.

Following the 397 group votes for penalty rates under the rule of penalizing allocations to the private accounts, 28 groups chose penalty rate 1.2 (in total, 342 votes), 10 rate 0.8 (in total 15 votes), so that in 89.9 % of the 397 cases (87.5 % of the 408 group-periods with formal sanctions) a binding, efficient sanction was put in place. The non-binding 0.4 rate was selected in 24 cases, 0.0 in 16. Of the individual votes under formal sanctions for contributing to the private accounts (1,985 votes), 1,464 (73.8 %) were for 1.2, 79 (4.0 %) for 0.8, 73 (3.6 %) for 0.4 and 369 (18.6 %) for 0.0.

**Figure B.1:** The trends of average contribution to the public account and average amount of informal sanctions given in treatments without administrative cost (combined)



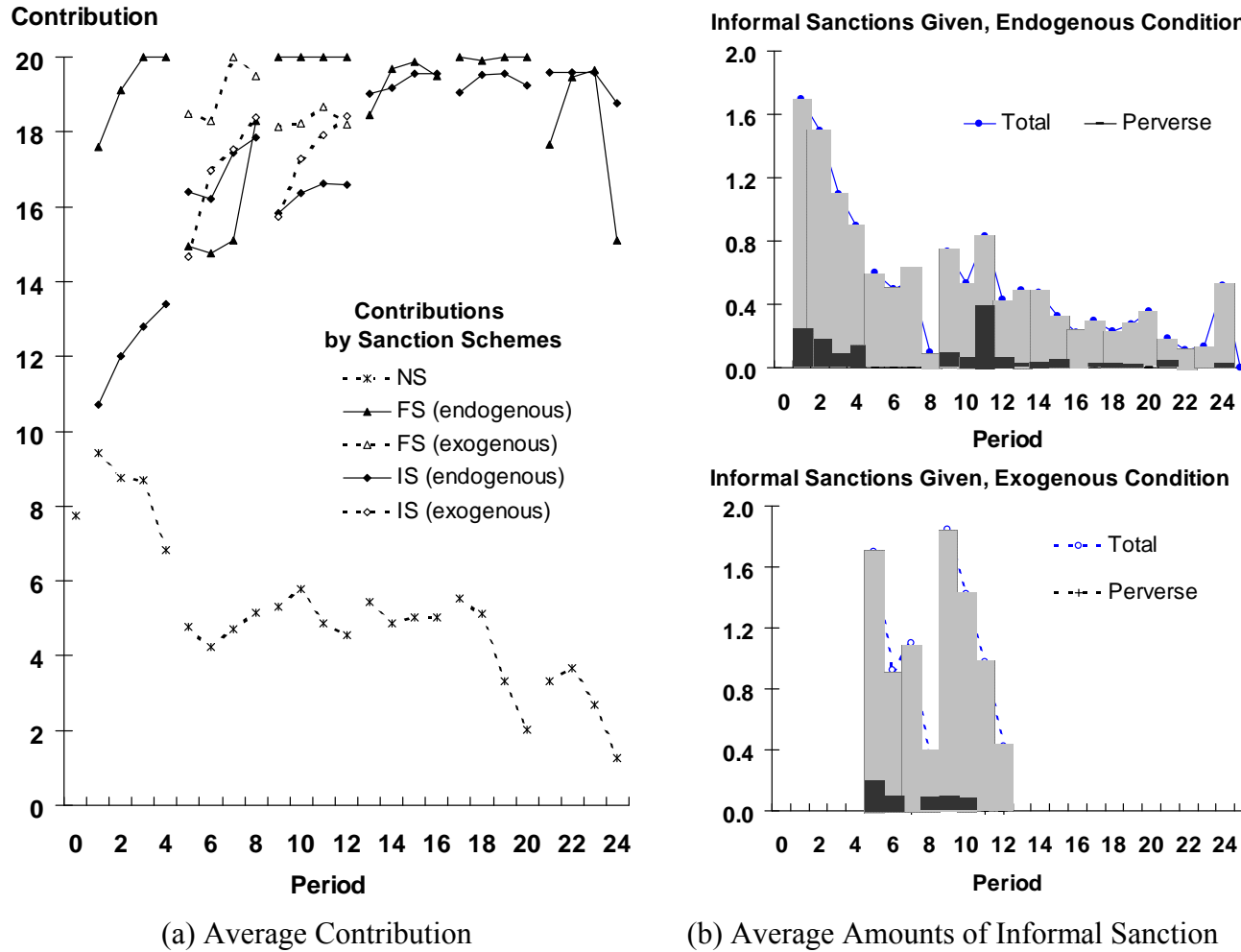
(a) Average Contribution



(b) Average Amounts of Informal Sanction

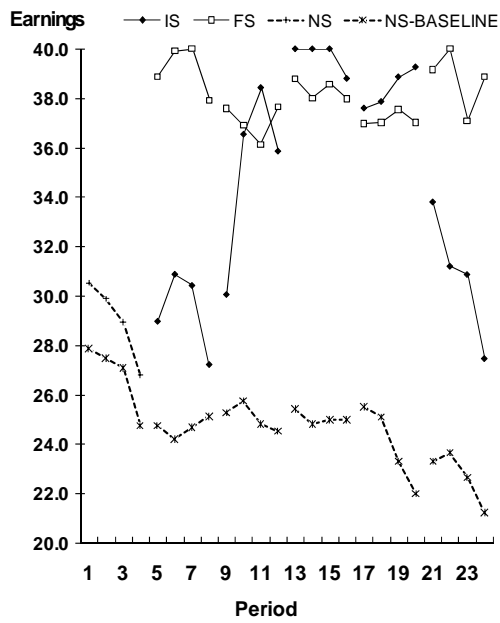
Notes: 1. NS in (a) is the average of contributions in the BASELINE treatment and those in periods 1 – 4 in the 3(FI)-N, 3(IF)-N, 3(FI)-C and 3(IF)-C treatments.  
2. No group chose informal scheme in phase 1 (periods 1 – 4) in the choice between formal vs. informal schemes.

**Figure B.2:** The trends of average contribution to the public account and average amount of informal sanctions given in treatments with administrative cost (combined)

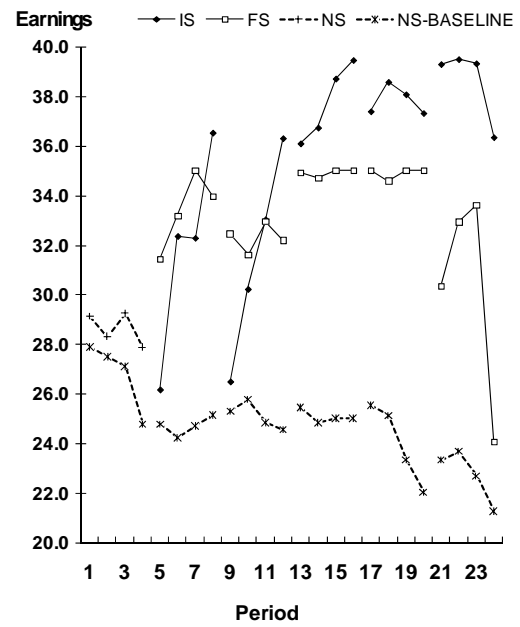


Note: 1. NS in (a) is the average of contributions in the BASELINE treatment and those in periods 1 – 4 in the 3(FI)-N, 3(IF)-N, 3(FI)-C and 3(IF)-C treatments.

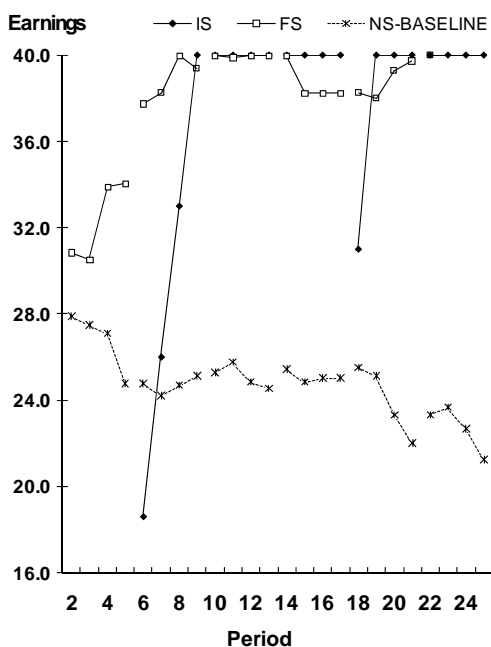
**Figure B.3:** The trends of average earnings



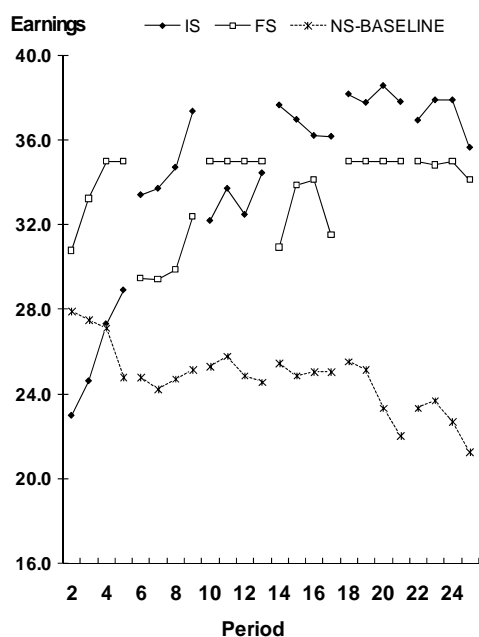
(a) 3-Vote without administrative cost



(b) 3-Vote with administrative cost<sup>1</sup>



(c) 6-N treatment<sup>2</sup>



(d) 6-C treatment

*Notes:*

1. In the 3-Vote with administrative cost, in phase 6 only 3 groups chose formal scheme, and one of them chose nonbinding sanction rate in periods 21 and 24 (See Appendix Table B.1)
2. In the 6-N treatment, no (1) group chose informal scheme in phase 1 (in phases 2 – 6)



**Table B.2:** Group-level Phase-by-phase Mann-Whitney Tests of difference of contributions without sanction scheme and with sanction scheme

1) All 3-Vote and 6-Vote treatments vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, FS (endogenous)	14.73(9)	17.84(10)	20.00(8)	19.03(28)	18.77(23)	19.09(24)
p-value	[0.0063]	[0.0008]	[0.0005]	[0.0000]	[0.0000]	[0.0000]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	---	4.71(8)	5.12(8)	---	---	---
Average Contribution, FS (exogenous)	---	19.30(15)	18.24(16)	---	---	---
p-value	---	[0.0001]	[0.0001]	---	---	---

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, IS (endogenous)	12.23(6)	17.58(5)	16.88(7)	19.39(18)	19.35(23)	18.68(22)
p-value	[0.0488]	[0.0034]	[0.0025]	[0.0000]	[0.0000]	[0.0000]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	---	4.71(8)	5.12(8)	---	---	---
Average Contribution, IS (exogenous)	---	15.85(16)	17.52(15)	---	---	---
p-value	---	[0.0001]	[0.0001]	---	---	---

2) All 3-Vote and 6-Vote treatments without administrative cost vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, FS (endogenous)	13.46(7)	19.22(6)	19.99(6)	18.89(20)	18.44(18)	19.46(18)
p-value	[0.0485]	[0.0017]	[0.0015]	[0.0000]	[0.0001]	[0.0000]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	---	4.71(8)	5.12(8)	---	---	---
Average Contribution, FS (exogenous)	---	19.57(7)	18.17(8)	---	---	---
p-value	---	[0.0011]	[0.0011]	---	---	---

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, IS (endogenous)	--- (0)	16.40(1)	20.00(1)	19.98(2)	19.36(4)	15.5(4)
p-value	---	[0.1213]	[0.1213]	[0.0367]	[0.0066]	[0.0401]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	---	4.71(8)	5.12(8)	---	---	---
Average Contribution, IS (exogenous)	---	14.81(8)	17.73(7)	---	---	---
p-value	---	[0.0016]	[0.0012]	---	---	---

3) All 3-Vote and 6-Vote treatments with administrative cost vs. BASELINE treatment  
(including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, FS (endogenous)	19.18(2)	15.78(4)	20.00(2)	19.38(8)	19.98(5)	17.97(6)
p-value	[0.0182]	[0.0270]	[0.0361]	[0.0006]	[0.0030]	[0.0019]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	---	4.71(8)	5.12(8)	---	---	---
Average Contribution, FS (exogenous)	---	19.07(8)	18.31(8)	---	---	---
p-value	---	[0.0008]	[0.0008]	---	---	---

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, IS (endogenous)	12.23(6)	16.98(4)	16.36(6)	19.32(16)	19.34(19)	19.38(18)
p-value	[0.0488]	[0.0066]	[0.0045]	[0.0001]	[0.0000]	[0.0000]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	---	4.71(8)	5.12(8)	---	---	---
Average Contribution, IS (exogenous)	---	16.89(8)	17.33(8)	---	---	---
p-value	---	[0.0008]	[0.0008]	---	---	---

4) 3(FI)-N treatment vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2 (FS)	Phase 3 (IS)	Phase 4	Phase 5	Phase 6
Average Contribution, NS	---	4.71(8)	5.12(8)	---	---	---
Average Contribution, FS or IS (exogenous)	---	19.57(7)	17.73(7)	---	---	---
p-value	---	[0.0011]	[0.0012]	---	---	---

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, FS or IS (endogenous)	---	---	---	19.99(7)	19.66(7)	19.29(7)
p-value	---	---	---	[0.0008]	[0.0010]	[0.0010]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, FS (endogenous)	---	---	---	20.00(6)	19.54(5)	19.00(5)
p-value	---	---	---	[0.0013]	[0.0030]	[0.0032]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, IS (endogenous)	---	---	---	20.00(1)	19.95(2)	20.00(2)
p-value	---	---	---	[0.1213]	[0.0367]	[0.0361]

5) 3(IF)-N treatment vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2 (IS)	Phase 3 (FS)	Phase 4	Phase 5	Phase 6
Average Contribution, NS	---	4.71(8)	5.12(8)	---	---	---
Average Contribution, FS or IS (exogenous)	---	14.81(8)	18.17(8)	---	---	---
p-value	---	[0.0016]	[0.0011]	---	---	---

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, FS or IS (endogenous)	---	---	---	17.61(8)	16.93(8)	17.15(8)
p-value	---	---	---	[0.0056]	[0.0059]	[0.0028]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, FS (endogenous)	---	---	---	17.61(8)	15.58(7)	19.04(7)
p-value	---	---	---	[0.0056]	[0.0102]	[0.0010]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, IS (endogenous)	---	---	---	--- (0)	18.55(1)	2.00(1)
p-value	---	---	---	---	[0.1213]	[1.000]

6) 3(FI)-C treatment vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2 (FS)	Phase 3 (IS)	Phase 4	Phase 5	Phase 6
Average Contribution, NS	---	4.71(8)	5.12(8)	---	---	---
Average Contribution, FS, or IS (exogenous)	---	17.33(8)	19.07(8)	---	---	---
p-value	---	[0.0008]	[0.0008]	---	---	---

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	---	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, FS or IS (endogenous)	---	---	---	19.87(8)	19.99(8)	19.02(8)
p-value	---	---	---	[0.0006]	[0.0005]	[0.0006]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, FS (endogenous)	---	---	---	20.00(2)	20.00(1)	16.58(2)
p-value	---	---	---	[0.0361]	[0.1213]	[0.0367]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, IS (endogenous)	---	---	---	19.83(6)	19.99(7)	19.83(6)
p-value	---	---	---	[0.0019]	[0.0008]	[0.0015]

7) 3(IF)-C treatment vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2 (IS)	Phase 3 (FS)	Phase 4	Phase 5	Phase 6
Average Contribution, NS	---	4.71(8)	5.12(8)	---	---	---
Average Contribution, IS (exogenous)	---	16.89(8)	18.31(8)	---	---	---
p-value	---	[0.0008]	[0.0008]	---	---	---

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, FS or IS (endogenous)	---	---	---	19.59(8)	19.24(8)	18.93(8)
p-value	---	---	---	[0.0007]	[0.0008]	[0.0008]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, FS (endogenous)	---	---	---	19.90(3)	19.90(1)	15.00(1)
p-value	---	---	---	[0.0141]	[0.1213]	[0.1213]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, IS (endogenous)	---	---	---	19.40(5)	19.14(7)	19.49(7)
p-value	---	---	---	[0.0034]	[0.0012]	[0.0011]

8) 6-N treatment vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, FS or IS (endogenous)	13.46(7)	18.81(7)	19.99(7)	19.57(7)	19.47(7)	20.00(7)
p-value	[0.0485]	[0.0011]	[0.0008]	[0.0008]	[0.0010]	[0.0006]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, FS (endogenous)	13.46(7)	19.22(6)	19.99(6)	19.50(6)	19.55(6)	20.00(6)
p-value	[0.0485]	[0.0017]	[0.0015]	[0.0015]	[0.0015]	[0.0013]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, IS (endogenous)	--- (0)	16.4(1)	20.00(1)	20.00(1)	19.00(1)	20.00(1)
p-value	---	[0.1213]	[0.1213]	[0.1213]	[0.1213]	[0.1213]

9) 6-C treatment vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, FS or IS (endogenous)	13.96(8)	16.38(8)	17.27(8)	18.56(8)	19.20(8)	19.14(8)
p-value	[0.0055]	[0.0023]	[0.0015]	[0.0006]	[0.0005]	[0.0006]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, FS (endogenous)	19.18(2)	15.78(4)	20.00(2)	18.43(3)	20.00(3)	19.90(3)
p-value	[0.0182]	[0.0270]	[0.0361]	[0.0141]	[0.0134]	[0.0141]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, NS	8.42(39)	4.71(8)	5.12(8)	5.09(8)	4.00(8)	2.73(8)
Average Contribution, IS (endogenous)	12.23(6)	16.98(4)	16.36(6)	18.64(5)	18.72(5)	18.68(5)
p-value	[0.0488]	[0.0066]	[0.0045]	[0.0030]	[0.0030]	[0.0030]

**Table B.3:** Effects of informal sanction received at  $t$  on the change of contributions,  $C(t+1) - C(t)$ .

(a) For combined data

Independent variable	All Periods	Exogenous informal scheme	Endogenous informal scheme
Informal sanction received in period $t$	0.20*** (0.047)	0.24** (0.10)	0.20*** (0.050)
(Informal sanction received)*(Below median dummy) in period $t$	0.090* (0.052)	0.078 (0.11)	0.14 (0.095)
(Informal sanction received)*(Above median dummy) in period $t$	-0.27*** (0.067)	-0.31* (0.16)	-0.28*** (0.067)
Below median dummy in period $t$	1.37*** (0.42)	2.41* (1.20)	0.70 (0.63)
Above median dummy in period $t$	-1.20*** (0.40)	-2.93** (1.20)	-1.05** (0.40)
Period within phase	-0.29*** (0.10)	-0.70** (0.30)	-0.11 (0.083)
Constant	0.22 (0.21)	0.80 (0.76)	-0.075 (0.18)
Test of joint effect, below median contributors <sup>7</sup> (p-value)	(0.000)	(0.000)	(0.000)
Test of joint effect, above median contributors <sup>8</sup>	(0.199)	(0.451)	(0.207)
Number of observations	1680	465	1215
F	28.18	33.94	19.83
Prob > F	0.0000	0.0000	0.0000

(b) For treatments with (without) administrative cost only

Independent variable	All treatments <i>without</i> administrative cost			All treatments <i>with</i> administrative cost		
	All periods	exogeno us	endogeno us	All periods	exogeno us	endogeno us
Informal sanction received at period $t$	0.32** (0.13)	0.35** (0.12)	0.49 (0.27)	0.16*** (0.040)	0.16* (0.076)	0.16*** (0.038)
(Informal sanction received)*(Below median dummy) at period $t$	-0.0085 (0.14)	-0.081 (0.15)	-0.27 (0.32)	0.12** (0.049)	0.16* (0.078)	0.18* (0.098)
(Informal sanction received)*(Above median dummy) at period $t$	-0.40** (0.16)	-0.53*** (0.13)	1.67** (0.52)	-0.22*** (0.069)	0.034 (0.16)	-0.28*** (0.072)
Below median dummy at period $t$	1.51 (1.29)	1.13 (1.78)	4.14 (2.05)	1.29*** (0.42)	4.06*** (1.36)	0.50 (0.63)
Above median dummy at period $t$	-2.04 (1.64)	-3.30 (2.14)	-9.27*** (1.08)	-1.10*** (0.34)	-3.53** (1.30)	-0.80*** (0.21)
Period within phase	-0.70* (0.34)	-1.44** (0.53)	0.17 (0.18)	-0.16* (0.090)	0.056 (0.17)	-0.15 (0.096)
Constant	0.95 (0.80)	2.65* (1.26)	-0.61 (0.52)	0.0048 (0.17)	-1.00** (0.44)	0.018 (0.20)
Test of joint effect, below median contributors <sup>7</sup>	(.000)	(.003)	(.032)	(.000)	(.000)	(.001)
Test of joint effect, above median contributors <sup>8</sup>	(.537)	(.089)	(.000)	(.310)	(.167)	(.100)
Number of observations	405	225	180	1275	240	1035
F	33.68	89.46	10730	34.63	38.72	34.22
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Notes:

1. Fixed effects Linear regressions with robust standard error clustered by group. The dependent variable is the difference of contribution between  $t$  and  $t+1$  while all independent variables are evaluated at period  $t$ . Data include both 3-Vote and 6-Vote treatments.
2. The number in the parenthesis is the standard deviation.
3. \*, \*\*, and \*\*\* indicate significance at the .10 level, the .05 level and the .01 level, respectively.
4. Below (above) median dummy equals 1 if an individual's contribution is below (above) the median of his or her group.
5. Period within phase = {1, 2, 3}. No data in period within phase = 4 is not included since each phase has 4 periods.
6. This is a test of the hypothesis that the coefficient on Informal sanctions received in period  $t$  plus the coefficient on informal sanctions \* below median dummy = 0.
7. This is a test of the hypothesis that the coefficient on Informal sanctions received in period  $t$  plus the coefficient on informal sanctions \* above median dummy = 0.



**Table B.4:** Group-level Phase-by-phase Mann-Whitney Tests between earnings without sanction scheme and with sanction scheme

1) All 3-Vote and 6-Vote treatments vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	28.42(39)	24.71(8)	25.12(8)	25.09(8)	24.00(8)	22.73(8)
Average Earnings, FS (endogenous)	32.60(9)	35.43(10)	38.73(8)	37.19(28)	37.11(23)	37.52(24)
p-value	[0.0335]	[0.0042]	[0.0006]	[0.0000]	[0.0001]	[0.0000]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	24.71(8)	25.12(8)	---	---	---
Average Earnings, FS (exogenous)	---	36.10(15)	34.69(16)	---	---	---
p-value	---	[0.0001]	[0.0012]	---	---	---

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	28.42(39)	24.71(8)	25.12(8)	25.09(8)	24.00(8)	22.73(8)
Average Earnings, IS (endogenous)	25.95(6)	33.71(5)	34.17(7)	37.70(18)	37.96(23)	37.27(22)
p-value	[0.1373]	[0.0084]	[0.0631]	[0.0002]	[0.0000]	[0.0001]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	24.71(8)	25.12(8)	---	---	---
Average Earnings, IS (exogenous)	---	30.60(16)	33.24(15)	---	---	---
p-value	---	[0.0048]	[0.0016]	---	---	---

2) All 3-Vote and 6-Vote treatments without administrative cost vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	28.42(39)	24.71(8)	25.12(8)	25.09(8)	24.00(8)	22.73(8)
Average Earnings, FS (endogenous)	32.34(7)	38.86(6)	39.98(6)	38.45(20)	37.71(18)	39.19(18)
p-value	[0.0955]	[0.0017]	[0.0015]	[0.0000]	[0.0001]	[0.0000]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	24.71(8)	25.12(8)	---	---	---
Average Earnings, FS (exogenous)	---	39.19(7)	37.09(8)	---	---	---
p-value	---	[0.0011]	[0.0115]	---	---	---

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	28.42(39)	24.71(8)	25.12(8)	25.09(8)	24.00(8)	22.73(8)
Average Earnings, IS (endogenous)	--- (0)	29.4(1)	40.00(1)	39.85(2)	38.24(4)	33.13(4)
p-value	---	[0.2453]	[0.1213]	[0.0367]	[0.0066]	[0.1742]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	24.71(8)	25.12(8)	---	---	---
Average Earnings, IS (exogenous)	---	29.38(8)	35.22(7)	---	---	---
p-value	---	[0.0742]	[0.0018]	---	---	---

3) All 3-Vote and 6-Vote treatments with administrative cost vs. BASELINE treatment  
(including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	28.42(39)	24.71(8)	25.12(8)	25.09(8)	24.00(8)	22.73(8)
Average Earnings, FS (endogenous)	33.51(2)	30.30(4)	35(2)	34.05(8)	34.96(5)	32.49(6)
p-value	[0.1155]	[0.1735]	[0.0361]	[0.0008]	[0.0030]	[0.0029]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	24.71(8)	25.12(8)	---	---	---
Average Earnings, FS (exogenous)	---	33.39(8)	32.29(8)	---	---	---
p-value	---	[0.0011]	[0.0023]	---	---	---

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	28.42(39)	24.71(8)	25.12(8)	25.09(8)	24.00(8)	22.73(8)
Average Earnings, IS (endogenous)	25.95(6)	34.79(4)	33.20(6)	37.43(16)	37.90(19)	38.19(18)
p-value	[0.1373]	[0.0108]	[0.1209]	[0.0003]	[0.0000]	[0.0000]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	24.71(8)	25.12(8)	---	---	---
Average Earnings, IS (exogenous)	---	31.83(8)	31.50(8)	---	---	---
p-value	---	[0.0023]	[0.0209]	---	---	---

4) 3(FI)-N treatment vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2 (FS)	Phase 3 (IS)	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	24.71(8)	25.12(8)	---	---	---
Average Earnings, FS or IS (exogenous)	---	39.19(7)	35.22(7)	---	---	---
p-value	---	[0.0011]	[0.0018]	---	---	---

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	---	---	25.09(8)	24.00(8)	22.73(8)
Average Earnings, FS or IS (endogenous)	---	---	---	39.96(7)	39.48(7)	38.31(7)
p-value	---	---	---	[0.0008]	[0.0011]	[0.0011]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	---	---	25.09(8)	24.00(8)	22.73(8)
Average Earnings, FS (endogenous)	---	---	---	40.00 (6)	39.54 (5)	38.79 (5)
p-value	---	---	---	[0.0013]	[0.0030]	[0.0032]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	---	---	25.09(8)	24.00(8)	22.73(8)
Average Earnings, IS (endogenous)	---	---	---	39.70(1)	39.33(2)	37.13(2)
p-value	---	---	---	[0.1213]	[0.0367]	[0.0367]

5) 3(IF)-N treatment vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2 (IS)	Phase 3 (FS)	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	24.71(8)	25.12(8)	---	---	---
Average Earnings, FS or IS (exogenous)	---	31.42(8)	39.54(8)	---	---	---
p-value	---	[0.0742]	[0.0115]	---	---	---

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	---	---	25.09(8)	24.00(8)	22.73(8)
Average Earnings, FS or IS (endogenous)	---	---	---	37.10(8)	35.58(8)	36.22(8)
p-value	---	---	---	[0.0105]	[0.0082]	[0.0105]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	---	---	25.09(8)	24.00(8)	22.73(8)
Average Earnings, FS (endogenous)	---	---	---	37.10(8)	35.44(7)	38.79(7)
p-value	---	---	---	[0.0105]	[0.0142]	[0.0010]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	---	---	25.09(8)	24.00(8)	22.73(8)
Average Earnings, IS (endogenous)	---	---	---	--- (0)	36.55(1)	18.25(1)
p-value	---	---	---	---	[0.1213]	[0.1213]

6) 3(FI)-C treatment vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2 (FS)	Phase 3 (IS)	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	24.71(8)	25.12(8)	---	---	---
Average Earnings, FS, or IS (exogenous)	---	33.39(8)	31.50(8)	---	---	---
p-value	---	[0.0011]	[0.0209]	---	---	---

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	---	---	25.09(8)	24.00(8)	22.73(8)
Average Earnings, FS or IS (endogenous)	---	---	---	37.62(8)	38.74(8)	37.24(8)
p-value	---	---	---	[0.0007]	[0.0006]	[0.0010]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	---	---	25.09(8)	24.00(8)	22.73(8)
Average Earnings, FS (endogenous)	---	---	---	35.00(2)	35.00(1)	30.35(2)
p-value	---	---	---	[0.0361]	[0.1213]	[0.0676]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	---	---	25.09(8)	24.00(8)	22.73(8)
Average Earnings, IS (endogenous)	---	---	---	38.49(6)	39.28(7)	39.54(6)
p-value	---	---	---	[0.0019]	[0.0010]	[0.0017]

7) 3(IF)-C treatment vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2 (IS)	Phase 3 (FS)	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	24.71(8)	25.12(8)	---	---	---
Average Earnings, IS (exogenous)	---	31.83(8)	32.29(8)	---	---	---
p-value	---	[0.0023]	[0.0023]	---	---	---

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	---	---	25.09(8)	24.00(8)	22.73(8)
Average Earnings, FS or IS (endogenous)	---	---	---	36.10(8)	36.19(8)	36.84(8)
p-value	---	---	---	[0.0008]	[0.0008]	[0.0008]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	---	---	25.09(8)	24.00(8)	22.73(8)
Average Earnings, FS (endogenous)	---	---	---	34.84(3)	34.79(1)	30.00(1)
p-value	---	---	---	[0.0141]	[0.1213]	[0.1213]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	---	---	---	25.09(8)	24.00(8)	22.73(8)
Average Earnings, IS (endogenous)	---	---	---	36.85(5)	36.39(7)	37.81(7)
p-value	---	---	---	[0.0034]	[0.0012]	[0.0011]

8) 6-N treatment vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	28.42(39)	24.71(8)	25.12(8)	25.09(8)	24.00(8)	22.73(8)
Average Earnings, FS or IS (endogenous)	32.34(7)	37.51(7)	39.98(7)	38.89(7)	38.68(7)	40.00(7)
p-value	[0.0955]	[0.0016]	[0.0008]	[0.0008]	[0.0010]	[0.0006]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	28.42(39)	24.71(8)	25.12(8)	25.09(8)	24.00(8)	22.73(8)
Average Earnings, FS (endogenous)	32.34 (7)	38.86(6)	39.98(6)	38.70(6)	38.83(6)	40.00(6)
p-value	[0.0955]	[0.0017]	[0.0015]	[0.0015]	[0.0015]	[0.0013]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	28.42(39)	24.71(8)	25.12(8)	25.09(8)	24.00(8)	22.73(8)
Average Earnings, IS (endogenous)	--- (0)	29.40(1)	40.00(1)	40.00(1)	37.75(1)	40.00(1)
p-value	---	[0.2453]	[0.1213]	[0.1213]	[0.1213]	[0.1213]

9) 6-C treatment vs. BASELINE treatment (including Phase 1 in the 3-Vote treatment)

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	28.42(39)	24.71(8)	25.12(8)	25.09(8)	24.00(8)	22.73(8)
Average Earnings, FS or IS (endogenous)	27.84(8)	32.54(8)	33.65(8)	35.20(8)	36.92(8)	36.20(8)
p-value	[0.6004]	[0.0156]	[0.0354]	[0.0081]	[0.0007]	[0.0007]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	28.42(39)	24.71(8)	25.12(8)	25.09(8)	24.00(8)	22.73(8)
Average Earnings, FS (endogenous)	33.51(2)	30.30(4)	35.00(2)	32.62(3)	35.00(3)	34.74(3)
p-value	[0.1155]	[0.1735]	[0.0361]	[0.0244]	[0.0134]	[0.0141]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, NS	28.42(39)	24.71(8)	25.12(8)	25.09(8)	24.00(8)	22.73(8)
Average Earnings, IS (endogenous)	25.95(6)	34.79(4)	33.20(6)	36.74(5)	38.07(5)	37.08(5)
p-value	[0.1373]	[0.0108]	[0.1209]	[0.0377]	[0.0030]	[0.0032]

**Table B.5:** Group-level Phase-by-phase Mann-Whitney Tests between earnings with formal sanction scheme and with informal sanction scheme

1) All 3-Vote and 6-Vote treatments (combined)

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, IS (endogenous)	25.95(6)	33.71(5)	34.17(7)	37.70(18)	37.96(23)	37.27(22)
Average Earnings, FS (endogenous)	32.60(9)	35.43(10)	38.73(8)	37.19(28)	37.11(23)	37.52(24)
p-value	[0.0771]	[0.3866]	[0.3460]	[1.0000]	[0.9906]	[0.9330]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, IS (exogenous)	---	30.60(16)	33.24(15)	---	---	---
Average Earnings, FS (exogenous)	---	36.10(15)	34.69(16)	---	---	---
p-value	---	[0.0044]	[0.3733]	---	---	---

2) All 3-Vote and 6-Vote treatments without administrative cost

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, IS (endogenous)	--- (0)	29.4(1)	40.00(1)	39.85(2)	38.24(4)	33.13(4)
Average Earnings, FS (endogenous)	32.34(7)	38.86(6)	39.98(6)	38.45(20)	37.71(18)	39.19(18)
p-value	---	[0.0979]	[0.6831]	[0.4368]	[0.0856]	[0.0348]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, IS (exogenous)	---	29.38(8)	35.22(7)	---	---	---
Average Earnings, FS (exogenous)	---	39.19(7)	37.09(8)	---	---	---
p-value	---	[0.0024]	[0.0366]	---	---	---

3) All 3-Vote and 6-Vote treatments with administrative cost

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, IS (endogenous)	25.95(6)	34.79(4)	33.20(6)	37.43(16)	37.90(19)	38.19(18)
Average Contribution, FS (endogenous)	33.51(2)	30.30(4)	35(2)	34.05(8)	34.96(5)	32.49(6)
p-value	[0.1824]	[0.1465]	[0.4998]	[0.0068]	[0.0162]	[0.0008]

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, IS (endogenous)	---	33.39(8)	32.29(8)	---	---	---
Average Contribution, FS (exogenous)	---	31.83(8)	31.50(8)	---	---	---
p-value	---	[0.3442]	[0.8336]	---	---	---

4) 3-Vote treatment without administrative cost

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, IS (endogenous)	---	---	---	39.70(1)	38.40(3)	30.83(3)
Average Earnings, FS (endogenous)	---	---	---	38.34(14)	37.15(12)	38.79(12)
p-value	---	---	---	[0.1375]	[0.2104]	[0.0344]

5) 3-Vote treatment with administrative cost

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, IS (endogenous)	---	---	---	37.75(11)	37.84(14)	38.61(13)
Average Earnings, FS (endogenous)	---	---	---	34.90(5)	34.90(2)	30.23(3)
p-value	---	---	---	[0.0334]	[0.1030]	[0.0062]

6) 6-N treatment

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, IS (endogenous)	--- (0)	29.4(1)	40.00(1)	40.00(1)	37.75(1)	40.00(1)
Average Earnings, FS (endogenous)	32.34(7)	38.86(6)	39.98(6)	38.70(6)	38.83(6)	40.00(6)
p-value	---	[0.0979]	[0.6831]	[0.6831]	[0.2123]	[----]

7) 6-C treatment

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, IS (endogenous)	25.95(6)	34.79(4)	33.20(6)	36.74(5)	38.07(5)	37.08(5)
Average Earnings, FS (endogenous)	33.51(2)	30.30(4)	35.00(2)	32.62(3)	35.00(3)	34.74(3)
p-value	[0.1824]	[0.1465]	[0.4998]	[0.1501]	[0.1416]	[0.2726]



**Table B.6:** The Relationship between Earnings and Contributions under informal sanction scheme

(1) Earnings and Contributions under informal sanction scheme

(a) For all treatments (combined)

Independent variable	All treatments	All treatments <i>without</i> administrative charge			All treatments <i>with</i> administrative charge		
		All periods	exogenous	endogenous	All periods	exogenous	endogenous
Contribution	0.95*** (0.16)	0.45*** (0.29)	0.57*** (0.18)	0.78* (0.38)	1.18*** (0.14)	1.13*** (0.21)	1.11*** (0.16)
Constant	18.1*** (2.77)	26.2*** (4.98)	22.9*** (2.87)	22.2** (6.83)	13.9*** (2.53)	12.4*** (3.52)	15.8*** (2.89)
Number of observations	2240	540	300	240	1700	320	1380
F	37.61	2.44	10.31	4.18	71.74	30.01	49.96
Prob > F	0.0000	0.1394	0.0063	0.0963	0.0000	0.0001	0.0000

(b) For 3-Vote treatments only

Independent variable	All treatments	All treatments <i>without</i> administrative charge			All treatments <i>with</i> administrative charge		
		All periods	exogenous	endogenous	All periods	exogenous	endogenous
Contribution	0.85*** (0.20)	0.31*** (0.29)	0.57*** (0.18)	-0.16 (0.098)	1.18*** (0.19)	1.13*** (0.21)	0.98*** (0.22)
Constant	19.9*** (3.65)	28.1*** (4.85)	22.9*** (2.87)	38.2*** (1.68)	13.9*** (3.58)	12.4*** (3.52)	18.9*** (4.28)
Number of observations	1520	440	300	140	1080	320	760
F	17.75	1.10	10.31	2.79	38.65	30.01	20.18
Prob > F	0.0002	0.3129	0.0063	0.1699	0.0000	0.0001	0.0006

(c) For 6-Vote treatments only

Independent variable	(1) All treatments	(2) 6-N treatment	(3) 6-C treatment
Contribution	1.18*** (0.17)	1.14*** (0.31)	1.19*** (0.22)
Constant	14.2*** (2.98)	15.6*** (6.12)	14.0** (3.62)
Number of observations	720	100	620
F	46.01	13.66	30.48
Prob > F	0.0005	0.0004	0.0027

*Notes:*

1. Fixed effects Linear regressions with robust standard error clustered by group for all columns except the column (2) in the (c), and Fixed effect Linear regression with robust standard error in column (2) in the table (c); In column (2) in the table (c), error terms are not adjusted for clustering on group since robust covariance is not full rank if we use the clustering. Data include both 3-Vote and 6-Vote treatments.
2. The number in the parenthesis is the standard deviation.
3. \*, \*\* and \*\*\* indicate significance at the .10 level, the 0.05 level and the .01 level, respectively.

(2) Earnings and the positive or negative deviation of contributions from group median of contributions under informal sanction scheme

(a) For all treatments (combined)

Independent variable	All treatments	All treatments <i>without</i> administrative charge			All treatments <i>with</i> administrative charge		
		All periods	exogenous	endogenous	All periods	exogenous	endogenous
Positive deviation from the median of contributions in his or her group	-1.42*** (0.24)	-1.09*** (0.25)	-1.26*** (0.23)	-0.61 (0.34)	-1.84*** (0.20)	-1.47*** (0.32)	-1.79*** (0.26)
Negative deviation from the median of contributions in his or her group	1.17*** (0.16)	0.74*** (0.20)	0.72** (0.27)	0.86*** (0.21)	1.35*** (0.21)	1.31*** (0.22)	1.25*** (0.23)
Constant	36.2*** (0.14)	35.3*** (0.22)	34.3*** (0.37)	36.7*** (0.13)	36.6*** (0.13)	34.3*** (0.37)	37.0*** (0.11)
Number of observations	2240	540	300	240	1700	320	1380
F	41.35	20.08	23.35	13.03	58.80	27.55	31.79
Prob > F	0.0000	0.0001	0.0000	0.0104	0.0000	0.0000	0.0000

Notes:

1. Fixed effects Linear regressions with robust standard error clustered by group. Data include both 3-Vote and 6-Vote treatments.
2. The number in the parenthesis is the standard deviation.
3. \*\* and \*\*\* indicate significance at the .05 level and the .01 level, respectively.

## (b) For 3-Vote treatments only

Independent variable	All treatments	All treatments <i>without</i> administrative charge			All treatments <i>with</i> administrative charge		
		All periods	exogen ous	endoge nous	All periods	exogeno us	endogen ous
Positive deviation from the median of contributions in his or her group	-1.26*** (0.25)	-1.06*** (0.24)	-1.26*** (0.23)	-0.38*** (0.085)	-1.90*** (0.33)	-1.47*** (0.32)	-1.33** (0.49)
Negative deviation from the median of contributions in his or her group	1.09*** (0.18)	0.64*** (0.24)	0.72** (0.27)	-0.18 (0.24)	1.25*** (0.23)	1.31*** (0.22)	0.98*** (0.21)
Constant	36.5*** (0.16)	34.6*** (0.26)	34.3*** (0.37)	35.4*** (0.044)	37.3*** (0.16)	34.3*** (0.37)	38.4*** (0.077)
Number of observations	1520	440	300	140	1080	320	760
F	31.14	16.98	23.35	11.78	34.01	27.55	19.17
Prob > F	0.0000	0.0002	0.0000	0.0211	0.0000	0.0000	0.0001

*Notes:*

1. Fixed effects Linear regressions with robust standard error clustered by group.
2. The number in the parenthesis is the standard deviation.
3. \*\* and \*\*\* indicate significance at the .05 level and the .01 level, respectively.

(c) For 6-Vote treatments only

Independent variable	(1) All treatments	(2) 6-N treatment	(3) 6-C treatment
Positive deviation from the median of contributions in his or her group	-1.86*** (0.27)	-3.75*** (0.15)	-1.83*** (0.27)
Negative deviation from the median of contributions in his or her group	1.51*** (0.33)	1.03*** (0.33)	1.82*** (0.43)
Constant	35.7*** (0.18)	38.4*** (0.44)	35.4*** (0.22)
Number of observations	720	100	620
F	29.59	389.67	25.17
Prob > F	0.0008	0.0000	0.0025

*Notes:*

1. Fixed effects Linear regressions with robust standard error clustered by group (Column (1) and (3)) and Fixed effect Linear regression with robust standard error (Column (2)). In column (2), error terms are not adjusted for clustering on group since robust covariance is not full rank if we use the clustering.
2. The number in the parenthesis is the standard deviation.
3. \*\*\* indicate significance at the .01 level, respectively.

**Table B.7: Determinants of Votes between Formal vs. Informal Schemes, 6 Vote Treatments**

Independent variable	6-N treatment			6-C treatment		
	(1) Pooled	(2) 1 <sup>st</sup> vote	(3) 2 <sup>nd</sup> -5 <sup>th</sup> votes	(4) Pooled	(5) 1 <sup>st</sup> vote	(6) 2 <sup>nd</sup> -5 <sup>th</sup> votes
Avg. Conditional Contribution	-0.033 (0.060)	-0.0071 (0.051)	-0.044 (0.10)	-0.086 (0.077)	-0.021 (0.051)	-0.16* (0.087)
IQ	0.27* (0.15)	0.072 (0.12)	0.53* (0.30)	0.0057 (0.15)	-0.023 (0.10)	0.030 (0.15)
Gender	-0.24 (0.61)	-0.42 (0.53)	0.13 (1.01)	0.47 (0.68)	0.43 (0.46)	0.41 (0.69)
General Political Orientation	-0.13 (1.39)	-0.0033 (0.15)	-0.32 (0.31)	-0.0098 (0.16)	0.16 (0.12)	-0.15 (0.17)
Fraction of IS (history)	---	---	-2.46** (1.21)	---	---	-2.22*** (0.67)
Vote number	-0.060 (0.074)	---	0.044 (0.15)	- 0.14** (0.068)	---	-0.27*** (0.11)
Constant	0.63 (1.39)	0.70 (1.17)	0.12 (2.51)	0.19 (1.78)	-0.82 (1.23)	3.03 (1.94)
Number of observations	210	35	175	240	40	200
Log likelihood	-84.2	-16.8	-50.5	-113.5	-25.1	-81.6
Wald (LR) $\chi^2$	5.81	1.34	10.6	6.05	4.28	15.4
Prob > $\chi^2$	.325	.855	.100	.301	.370	.017
Pseudo R <sup>2</sup>	---	.0382	---	---	.0784	---

Notes: 1. Random-effects Probit Regressions (columns (1), (3), (4), (6)) and Probit Regressions (columns (2), (5)). The dependent variable equals 1 if the subject voted for the use of the formal regime, 0 otherwise.

2. The Perv Pun Dummy equals 1 if a subject has ever punished another member even if the member contributed above the median of contributions in a group under exogenous informal scheme, 0 otherwise. The Perv Rec Dummy equals 1 if a subject has received punishment even if the subject contributed above the median of contributions in a group under exogenous informal scheme, 0 otherwise.

3. The Female variable equals 1 if a subject is female, 0 otherwise.

4. Phase 2 dummy equals 1 if Phase 2 is under formal scheme, 0 otherwise. Vote number  $\in \{1, 2, 3\}$ .

5. The figure in the parenthesis is standard deviation.

6. \*, \*\*, and \*\*\* indicate significance at the .10 level, at the 0.05 level and at the .01 level, respectively.

**Table B.8: Endogenous IS in the 6-C treatment vs. exogenous IS in the IS-comparison treatment**

(1) Average Contribution

	Phase 1 <sup>a</sup>	Phase 1 <sup>b</sup>	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Contribution, IS in the 6-C treatment	12.2 (6)	13.2 (4)	16.5 (4)	18.2(4)	18.3(4)	18.40(4)	18.4(4)
Average Contribution, Control treatment	7.08 (6)	7.08 (6)	10.5 (6)	11.2(6)	11.4(6)	12.2(6)	12.4(6)
p-value	[0.150]	[0.136]	[0.394]	[0.271]	[0.172]	[0.172]	[0.280]

(2) Average Earnings

	Phase 1 <sup>a</sup>	Phase 1 <sup>b</sup>	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Average Earnings, IS in the 6-C treatment	25.9 (6)	27.0 (4)	34.8 (4)	36.3 (4)	35.9 (4)	37.6 (4)	36.4 (4)
Average Earnings, Control treatment	20.2 (6)	20.2 (6)	27.8 (6)	27.8 (6)	30.1 (6)	30.7 (6)	31.9 (6)
p-value	[0.150]	[0.286]	[0.201]	[0.379]	[0.256]	[0.256]	[0.649]

Note: p-values are those of group-level Mann-Whitney tests. For phase 2, the 2<sup>a</sup> column is calculated including all 6 groups that voted for and used IS in that phase, while the 2<sup>b</sup> column's calculations