Instructions for Buyers

You are now taking part in an economic experiment. Please read the following instructions carefully. Everything that you need to know to participate in this experiment is explained below. Should you have any difficulties in understanding these instructions please notify us. We will answer your questions at your cubicle.

At the beginning of the experiment you will receive an initial sum of **8 Euro**. During the course of the experiment you can earn a further amount of money by gaining **points**. The amount of points that you gain during the experiment depends on your decisions and the decisions of other participants.

All points that you gain during the course of the experiment will be exchanged into Euro at the end of the experiment. The exchange rate will be:

1 point = 4 cents

At the end of the experiment you will receive the sum of money that you earned during the experiment in addition to your 8 Euro initial sum.

The experiment is divided into periods. In each period you have to make decisions which you will enter in a computer. There are 18 periods in all.

Please note that communication between participants is strictly prohibited during the experiment. In addition we would like to point out that you may only use the computer functions which are required for the experiment. Communication between participants and unnecessary interference with computers will lead to exclusion from the experiment. In case you have any questions we shall be glad to assist you.

Prior to the experiment the 17 participants were divided into 2 groups: buyers and sellers. In this experiment there are 10 sellers and 7 buyers.

You shall be a buyer for the entire course of the experiment. All participants have received an identification number, which they will keep for the entire experiment. Your identification number is stated on the documentation sheet in front of you.

An Overview of the Experiment Procedures

In each period of the experiment every buyer can trade a product with one seller. The seller earns a profit through the trade when he sells the product at a price that exceeds his production costs. The buyer earns a profit through the trade when the amount he pays for the product is less than what it is worth to him. How high the production costs are for the traded product, and how much it is worth to the buyer, depends on the quality of the product.

The experiment lasts 18 periods. In each period the procedures are as follows:

1. Each period commences with a **trading phase**, which lasts 150 seconds. During this phase buyers can submit trade offers, which can be accepted by sellers. When submitting an offer a buyer has to specify **four things**:
   - which price he offers to pay,
   - which product quality he desires,
   - which bonus he offers to pay,
   - and finally, which seller he wants to submit the offer to. Hereby, buyers can submit two types of offers; private offers and public offers. **Private offers are submitted to one seller only** and can only be accepted by that seller. **Public offers are submitted to all sellers** and can be accepted by any seller.

   Buyers can submit as many offers as they like in each period. Submitted offers can be accepted constantly. **Each buyer and each seller can only enter one trade agreement in each period.** As there are 10 sellers and 7 buyers, several sellers will not trade in each period.

2. Following the trading phase each seller who has entered a trade agreement determines which quality of product he will supply to his buyer. Hereby, **the seller is not obliged to supply the product quality desired by his buyer.**

3. Following the quality choice the buyer specifies the actual bonus. **The buyer is not obliged to pay the bonus offered initially.**

Please note: If the same buyer has made private offers to the same seller in two consecutive periods, and if the seller has accepted these two offers, the seller enjoys the "right to get an offer". This means that the buyer has to make this seller an offer in the next period. If the seller accepts, this "right to get an offer" continues to exist. If he rejects, the buyer is free to make an offer to any seller.

Once all sellers have chosen their product qualities, and all buyers have chosen their actual bonuses, incomes gained by each participant in that period are determined and reported on the screen. After this the next period commences. The points gained from all 18 periods will be summed up at the end of the experiment, exchanged into Euros and paid together with your initial sum of money in cash.

Procedures in Detail

There are 7 buyers and 10 sellers in the experiment. You are a buyer for the entire course of the experiment. During the experiment you will enter your decisions on the computer. In the following we describe in detail how you can make your decisions in each period.

1. The Trading Phase

Each period commences with a trading phase. During the trading phase each buyer can enter into a trading agreement with one seller. In order to do this the buyers can submit trade offers to the sellers. **A buyer can make as many offers as he wants**. During the trading phase you will see the following screen:

Buyer trading screen

- In the top left corner of the screen you will see the current period of the experiment. In the top right corner of the screen you will see the time remaining in this trading phase, displayed in seconds. **The trading phase in each period lasts 150 seconds.** When this time is up the trading phase is over. Hereafter, no further offers can be submitted or accepted for this period.

- Once you see the above screen displayed the trading phase commences. As a buyer you can enter into a trading agreement with a seller. Here you must specify four things on the right hand side of the screen:

  a) First you must specify whether you will make a public or a private offer:

  - **Public Offers**
    Public offers are communicated to all participants in the market. All sellers see all public offers on their screens. A public offer can thus be accepted by any seller. Buyers also see all public offers of the other buyers
    If you want to make a public offer, click with the mouse on the "public" field.

  - **Private Offers**
    Private offers are addressed to only a single seller. Only this seller receives this offer, and thus only this seller can accept the offer. All other sellers and buyers in the market are not informed about this offer.
    If you want to make a private offer, click with your mouse on the "private" field. Then, you indicate in the field below to which seller you want to direct the offer. All 10 sellers have an identification number (Seller 1, Seller 2, ..., Seller 10). A seller keeps the same number for the duration of the experiment. To direct an

offer to a particular seller, enter the number of that seller (for example, "4" for Seller 4).

b) After you have specified to whom you would like to address the offer, you must determine the **price**. You enter this in the field "price". The price may not be smaller than 0 and may not be higher than 100:

0 ≤ price ≤ 100

c) Next you must indicate the **offered bonus**. You enter this in the field "offered bonus". The offered bonus may not be smaller than 0 and may not be higher than 10.

0 ≤ offered bonus ≤ 100

d) Finally you must indicate, which product quality you desire. You enter this in the field "desired quality". The **desired quality** may not be smaller than 1 and may not be higher than 10:

1 ≤ desired quality ≤ 10

- After you have completely specified your offer you must click on the " OK" button in order to make the offer. As long as you have not yet clicked "OK" you can still revise your offer. After you click "OK" the offer will appear to all sellers to whom it was addressed.

- You can see on the left-hand side of your screen the heading "public offers". Here will be shown all public offers of the current trading phase. Both your own public offers, and the public offers of the other buyers are indicated. You can see which buyer made the offer, to which price she committed herself, which quality she desires, and which bonus she is offering. All buyers have an identification number, which is fixed for the entire duration of the experiment (Buyer 1, Buyer 2,…, Buyer 7).

- In the center of your screen, under the heading "private offers", are listed all of the private offers that you have submitted during the current trading phase. Here you see, to which sellers the offers have been made, the price to which the contract commits you, the quality you wish, and the bonus that you offered.

- **As long as none of your offers has been accepted by a seller, you can make in every period as many private and public contract offers as you wish.** Each offer that you have made can be accepted during the trading phase at any time.

- **Each buyer can conclude only a single trade in each period.** As soon as one of your offers has been accepted, you learn which seller has accepted which of your

offers. On the bottom right of your screen you see the number of the seller who has accepted your offer, the price, your desired quality, and your offered bonus. Since you can have only a single trade in each period, your other offers are cancelled automatically at the same time. At this point you can submit no further offers.

- **Each seller can accept at most one offer in each period.** As a buyer you are constantly informed about which sellers have still not accepted any offer. Under the heading "the following sellers have already accepted a contract" you see 10 fields. If a seller has accepted a contract, a + appears in the small box underneath his identification number. As a buyer you cannot make private offers to those sellers who have already accepted a contract.

- Once all 7 buyers have entered a trade agreement or after 150 seconds have elapsed, the trading phase is over.

- No buyer is obliged to submit trade offers, and no seller is obliged to accept a trade offer.

2. Determination of the Product Quality

- Following the trading phase, all sellers who have entered a trade agreement then determine which product quality they will supply to their respective buyers. **The product quality you desired is not binding for your seller.** Your seller can choose the exact quality you desired, but also a higher or lower product quality.

- The quality that the seller chooses must be an integer value between 1 and 10:

$1 \leq$ actual product quality ≤ 10

- While your seller is choosing the actual product quality, you will be asked on a separate screen, which actual product quality you expect to receive. You will also be asked how certain you are about this expectation.

3. Determination of the Actual Bonus

- Following the choice of the actual product quality, you choose the amount of the actual bonus. **The bonus that you offered initially is not binding for you**. You can choose to pay the amount of the offered bonus, but you can also pay a higher or lower bonus. The actual bonus must be an integer value between 0 and 100:

$0 \leq$ actual bonus ≤ 100

How are the incomes calculated?

Your income:

- If you have **not entered a trade agreement** during a trading phase, you receive in that period an income of **0 points.**

- If one of your offers has been accepted, your income depends on the price you agreed to pay, which actual product quality is chosen by the seller, and which actual bonus you chose to pay. Your income will be calculated as follows:

Your income = 10*product quality – price – actual bonus

- As you see from the formula above, your income is higher the higher is the actual product quality supplied by your seller. Your income is also higher, the lower is the price that you must pay for the product, and the lower is the actual bonus that you choose.

The income of your seller:

- If a seller has **not entered a trade agreement** during a trading phase, the seller gains an income of **5 points** for that period.

- If a seller has accepted a contract offer, his income depends on the price, minus the production cost that he has to pay. In addition, the seller's income is increased by the bonus amount you choose to pay. The income of your seller will be calculated as follows:

Income of your seller = price– production costs+ actual bonus

- The production costs of a seller are higher, the higher the quality of the product he chooses to deliver. The production costs for each product quality are displayed in the table below:

Quality	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Production cost	0	1	2	4	6	8	10	12	15	18

- The income of your seller is therefore higher, the higher is the price and the actual bonus. Also, the seller's income is higher, the lower is the actual quality he chooses to deliver.

The income of all buyers and sellers are determined in the same way. **Each buyer can therefore calculate the income of his seller and each seller can calculate the income of his buyer.** Furthermore, each buyer and seller is informed of the identification number of his trading partner in each period.

Please note that buyers and sellers can incur losses in each period. These losses have to be paid from your initial sum of money or from earnings in other periods.

You will be informed of your income and the income of your seller on an "**income screen**". On the screen (see below) the following will be displayed:

- Which seller you traded with
- Which price you paid
- Your offered bonus
- Your desired quality
- The actual quality chosen by your seller
- The actual bonus that you chose to pay
- The income of your seller in this period
- Your income in this period.

Buyer income screen

Please enter all the information in the documentation sheet supplied to you. After the income screen has been displayed, the respective period is concluded. Thereafter the trading phase of the following period commences. Once you have finished studying the income screen please click on the "next" button.

The sellers also view an income screen, which displays the above information. They see the ID of their trading partner, the price, the desired and supplied product quality, the offered and actual bonuses, as well as both incomes.

"Right to get an offer"-Rule

There is one more rule to consider. If the same buyer has made two private offers to the same seller in two consecutive periods, and both offers were accepted so that they each lead to a trade agreement, the seller enjoys the "right to get an offer" in the next period. This is the case, e.g., if buyer 1 makes seller 2 private offers, one in period 3 and one in period 4, which are both accepted by seller 2. Starting from period 5, seller 2 then enjoys the "right to get an offer".

The right to get an offer is thus established when a buyer has traded at least twice with the same seller, and if these trades came about through private offers. If trade comes

about based on a public offer, the right to get an offer is not established. Thus the buyer himself can decide whether he wants to enter a relationship with or without the right to get an offer.

In other words the "right to get an offer" means that in the next period the buyer must make the seller an offer that is available as soon as soon as the trading phase begins. This offer consists of a price, a desired quality, and an offered bonus. **The price must be at least as high as in the previous period.**

In the case that you have concluded a private offer contract two times in a row with the same seller, you will see the following screen:

Buyer standing offer screen

You see first on the screen, to which seller you must make an offer. Next, you see the minimum price that you have to pay (price of the previous period). Underneath, you can enter your offer. The offer is conveyed to "your" seller, who can accept or reject the offer. If he chooses to accept your offer, he remains contracted with you (and selects a product quality) and you must make another offer to him at the beginning of the next period. If he rejects your offer, you can again make private or public offers to all sellers. The offer right continues to be valid automatically, unless the seller chooses to reject the offer.

If a seller enjoys an "offer right" from you, during the trading phase you see the following screen:

Modified trading phase screen

This is the same screen as on page 3 with the only difference that in the upper right corner you can see your offer to your seller. The seller can decide at any time during the trading phase, whether he wants to accept your offer or not. So long as he has not decided, you cannot make offers to any other sellers. A text message in the upper right corner of the screen informs you: "The seller to whom you owe an offer right has not yet decided!"

In case your seller accepts your offer, then you will be informed with a different text message. It will read: "The seller has decided to accept your offer!"
In case the seller rejects your offer, or accepts the offer of another buyer, you will immediately be able to make offers to all other sellers. You will be informed of this by another text. In the case that your seller rejects your offer the text will read: "The seller has rejected your offer. You can now make offers again!" In case the seller accepts the offer of another buyer, the text will read: "The seller has accepted the offer of another buyer. You can now make offers again!"

An example concerning the right to get an offer: Suppose buyer 1 and seller 2 have traded in periods three and four, based on two private offers. Starting from period 5 seller 2 then enjoys the right to get an offer. This means that buyer 1 has to make seller 2 an offer in the fifth period before the trading period begins. If seller 2 accepts, the relation remains and buyer 1 will make seller 2 an offer also in period 6. If seller 2 rejects, the relation is terminated and buyer 1 can thereafter make offers to all sellers (public and private).

The experiment will not commence until all participants are completely familiar with all procedures. In order to secure that this is the case we kindly ask you to solve the exercises below.

In addition we will conduct **a training trial of the trading phase**, so that you can get accustomed to the computer. This trial phase will not be added to the result of the experiment and therefore not remunerated. Following the trial phase we will begin the experiment, which will last for 18 periods.

Exercises

Please solve the following problems including the solution approach. If you have any questions please ask the experimenter. Wrong answers have no consequences whatsoever.

Problem 1:

You have not accepted any offer during a trading period. What is your income in this particular period?

Your income =

Problem 2:

Your offer, with a price of 30, a desired quality of 9, and an offered bonus of 30, was accepted. Your seller chooses an actual quality of 8. You pay an actual bonus of 10.

Your income =

Income of your seller =

Problem 3:

Your offer, with price of 60, desired quality of 9, and offered bonus of 0, was accepted. Your seller chooses an actual quality of 6. You choose an actual bonus of 0.

Your income =

Income of your seller =

Problem 4:
Your offer, with price of 70, desired quality of 2, and offered bonus of 5, was accepted. Your seller chooses an actual quality of 2. You choose an actual bonus of 9.

Your income =

Income of your seller =

Problem 5:
Your offer, with price of 10, desired quality of 6, and offered bonus of 40, was accepted. Your seller chooses an actual quality of 3. You choose an actual bonus of 2.

Your income =

Income of your seller =

Problem 6
A seller has not accepted any contract offer during the trading phase. How high is the seller's income for that particular period?

Income of the seller =

Problem 7
In the eighth period you made a private offer to Seller 2. He accepted. In the ninth period you made a public offer, that was accepted by Seller 2. Does seller 2 enjoy an "offer right" from you in the tenth period?

- Yes
- No