General Instructions

Welcome to this economic experiment! In this experiment you can earn money with the decisions you make. How much you earn depends on your own decisions, the decisions of other participants as well as random events. All earnings you make in the experiment are in experimental points. 1 experimental point corresponds to 0.5 CHF and will be paid to you at the end of the experiment. In addition, you will receive a show up fee of 15 CHF.

From now on you are not allowed to communicate in any other way than specified in the instructions. Please obey to this rule because otherwise we have to exclude you from the experiment and all earnings you have made will be lost. Please also do not ask questions aloud. If you have a question, raise your hand. A member of the experimenter team will come to you and answer your question in private.

The experiment lasts approximately 70 minutes. The experiment consists of two parts that are independent of one another. For each part you will receive specific instructions. These instructions will explain how you make decisions and how your decisions and the decisions of other participants influence your earnings. Therefore, it is important that you read the instructions carefully.

In case you should make losses, the show up fee of 15 CHF is used to cover for these losses. If you make losses exceeding 15 CHF, you will have the option to leave immediately and earn 0 CHF.
Specific Instructions (Part 1)

[Treatment: Exclusive Bargaining]

We will now describe the general setting you will face during the experiment. The same decision situation (explained below) will be repeated for 10 periods. In each period, you will be matched into pairs. Each pair consists of a buyer and a seller. In each period new pairs will be formed randomly. That is, participants that are in the same pair will generally not be in the same pair in the next period. Note that at the beginning of the experiment, participants will be randomly divided into two blocks of six. The pairs of buyers and sellers are randomly formed within each of the two blocks, but a participant in one block will never meet a participant in the other block.

Your role (buyer or seller) is randomly determined at the beginning of each period. When you are a buyer in one period you may be a seller in the next one and likewise when you are a seller. You will not get to know the identity of the buyers or sellers you interact with, neither during nor after the experiment. Similarly, no participant will get to know your identity.

The decision situation will be the same for all 10 periods. We will now describe one such period. After the buyer and the seller have been matched, they face the following situation. The seller can be of two different types: type H or type L. A seller of type H can only produce a high quality good at cost 16. A seller of type L can only produce a low quality good at cost 0. The buyer’s valuation for the high quality good is 23. The buyer’s valuation for the low quality good is 10.

The seller knows whether she is of type H or type L and therefore also knows how much the good is worth to the buyer. However, the buyer does not know the seller’s type and hence, the buyer does neither know whether his valuation for the good is 23 or 10 nor whether the cost of the seller to produce the good is 16 or 0. The type of the seller will be determined randomly according to the following probabilities (at the beginning of each period and for every pair): the probability that the seller is of type H (high cost / high quality good) is 1/3 (33.33%) and the probability that the seller is of type L (low cost / low quality good) is 2/3 (66.67%).

To acquire the good, the buyer makes offers to the seller. The offers must be between 0 and 23 and can be as exact as to the first decimal place. Upon seeing the buyer’s offer, the seller can accept or reject the offer. If the seller rejects the offer, the buyer can make another offer to the seller which can again be accepted or rejected. If the offer is rejected, the buyer makes another offer and so on.

Importantly, if the seller rejects an offer, there is a probability that the buyer cannot make a further offer. This probability is 0.1 (10%). Correspondingly, the continuation probability is 0.9 (90%). Hence, if the seller
rejects an offer of a buyer, the probability that the buyer can make another offer is 0.9. **If the trading process ends before trade has occurred, the good is not produced (and not traded) and the seller and buyer both earn 0.**

For instance, suppose the buyer has made the first offer and this offer was rejected. Then, the process ends with a probability of 0.1 or the buyer can make a second offer with a probability of 0.9. So the probability that the buyer will be able to make a third offer (given that the seller rejects the first two offers) is $0.9 \times 0.9 = 0.81$. The probability that the buyer will be able to make a fourth offer is $0.9 \times 0.9 \times 0.9 = 0.729$. This shows that the number of stages before the market closes varies from period to period and is determined by the continuation probability. In any given stage, the probability to reach the next stage is 90%.

**If the seller accepts the offer,** she produces the good and sells it to the buyer at the agreed price. The seller and the buyer earn a payoff according to the description below. They then wait until all other pairs have finished their trading processes.

If an offer is accepted, the payoff of the seller and the buyer are determined as follows.

- **Buyer’s payoff** = Valuation of the Good -Accepted Offer
- **Seller’s payoff** = Accepted Offer - Production Cost

For convenience the valuations and costs are summarized below:

- **Buyer’s valuation for the high quality good** = 23
- **Buyer’s valuation for the low quality good** = 10
- **Seller’s cost of producing the high quality good** = 16
- **Seller’s cost of producing the low quality good** = 0

As an example, consider a buyer who offers a price of 9 and a seller who accepts this offer. If the seller is a type L (low quality) seller, her payoff is $(\text{Accepted Offer} - \text{Production Cost}) = 9 - 0 = 9$. The buyer’s payoff is $(\text{Valuation} - \text{Accepted Offer}) = 10 - 9 = 1$. On the other hand, if the seller is a type H (high quality) seller, her payoff if she accepts the offer is $(\text{Accepted Offer} - \text{Production Cost}) = 9 - 16 = -7$. The buyer’s payoff in this case is $(\text{Valuation} - \text{Accepted Offer}) = 23 - 9 = 14$.

Once all groups have traded the good at some price or the trading process has ended otherwise (recall, the stage at which this happens is determined by the continuation probability), the computer randomly determines your role (buyer or seller) in the next period and matches new pairs of buyers and sellers. Then the next period starts. The experiment ends after period 10.
This is period 2. You are a buyer.

Please make an offer to the seller and confirm your offer by clicking on the “Submit” button. On the left hand side your past offers are listed. The seller also sees a list of all past offers.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Offer</th>
<th>Accepted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.0</td>
<td>no</td>
</tr>
<tr>
<td>2</td>
<td>19.9</td>
<td>no</td>
</tr>
<tr>
<td>3</td>
<td>1.0</td>
<td>no</td>
</tr>
</tbody>
</table>

Your offer: [Box]

Submit

This is period 2. You are a seller.

You can decide whether to accept or reject the offer(s) of the buyer.

Buyer's offer: 10.0

Accept
Reject

Your type is: H
[Treatment: Competitive Bargaining Public Offers]

We will now describe the general setting you will face during the experiment. The same decision situation (explained below) will be repeated for **10 periods**. In each period there will be 3 groups, each consisting of 4 participants. More specifically, **in each group there is 1 seller and 3 buyers**. You will be one of these buyers or the seller. **In each period new groups will be formed randomly**. That is, the participants that are in the same group as you in general change from period to period.

**Your role (buyer or seller) is randomly determined at the beginning of each period.** When you are a buyer in one period you may be a seller in the next one and likewise when you are a seller. You will not get to know the identity of the buyers or sellers you interact with, neither during nor after the experiment. Similarly, no participant will get to know your identity.

The decision situation will be the same for all 10 periods. We will now describe one such period. After the 3 buyers and the seller have been matched, they face the following situation. The seller can be of two different types: **type H** or **type L**. A seller of type H can only produce a high quality good at cost $16$. A seller of type L can only produce a low quality good at cost $0$. The buyers’ valuation for the high quality good is $23$. The buyers’ valuation for the low quality good is $10$.

The seller knows whether she is of type H or type L and therefore also knows how much the good is worth to the buyer. However, **the buyers do not know the seller’s type** and hence, the buyer does neither know whether his valuation for the good is 23 or 10 nor whether the cost of the seller to produce the good is 16 or 0. The type of the seller will be determined randomly according to the following probabilities (at the beginning of each period and for every group): the **probability that the seller is of type H (high cost / high quality good) is 1/3 (33.33%)** and the **probability that the seller is of type L (low cost / low quality good) is 2/3 (66.67%).**

To acquire the good, **the buyers sequentially make offers** to the seller. More specifically, buyers will be assigned an **ID number 1, 2 or 3**. The buyer with the ID number 1 (in short, buyer 1) makes the first offer to the seller. The offers must be between 0 and 23 and can be as exact as to the first decimal place. Upon seeing buyer 1’s offer, the **seller can accept or reject** the offer.

**If the seller rejects the offer,** buyer 2 can make an offer to the seller which can again be accepted or rejected. If the offer is rejected, it is buyer 3’s turn to make an offer. If the offer is again rejected, buyer 1 can make a second offer and so on. Hence, there will be a sequence of offers made by buyer 1, 2, 3, 1, 2, 3, 1, 2, 3, 1, 2, …

Importantly, if the seller rejects an offer, there is a **probability that the market closes** and no further offers can be made by any buyer. The probability that the market closes after a rejection is $0.1$ (10%).
Correspondingly, the **continuation probability** is **0.9 (90%)**. Hence, if the seller rejects an offer of a buyer, the probability that the next buyer can make an offer is 0.9. **If the market closes before trade has occurred, the good is not produced (and not traded) and the seller and all buyers earn 0.**

For instance, suppose buyer 1 made the first offer and this offer was rejected. Then, the market closes with a probability of 0.1 or buyer 2 can make an offer with a probability of 0.9. So the probability that buyer 3 will be able to make an offer in this market (given that the seller rejects the offers of buyer 1 and 2) is 0.9*0.9=0.81. But note that **given stage 2 is reached** the probability that buyer 3 can make an offer is still 0.9. The probability that buyer 1 will be able to make another offer is 0.9*0.9*0.9=0.9³=0.729. This shows that the number of stages before the market closes varies from period to period and is determined by the continuation probability.

**If the seller accepts the offer,** she produces the good and sells it to the buyer who made the offer at the agreed price. The seller and the buyer who made the offer earn a payoff according to the description below. **The two buyers who did not trade earn a payoff of 0.** The buyers who are matched to the seller who accepted an offer do not make further offers and the group has to wait until all other groups have finished their trading processes.

If an offer is accepted, then the payoff of the seller and the buyer who has made the offer are determined as follows.

- **Buyer’s payoff** = Valuation of the Good - Accepted Offer
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For convenience the valuations and costs are summarized below:

- **Buyer’s valuation for the high quality good** = 23
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Once all groups have traded the good at some price or the market has closed (recall, the stage at which the market closes is determined according to the continuation probability), the computer randomly determines your role (buyer or seller) in the next period and matches new groups of buyers and sellers. Then the next period starts. The experiment ends after period 10.

A final important remark concerns your information about past offers. There will be a table listing all offers that were made by the buyers to the seller in previous stages. The table also shows who made the offer and in which stage. The seller as well as the 3 buyers see this table. **Hence, the seller knows the past offers and who made them.** Likewise, when a buyer makes his offer, he knows his own past offers and all the past offers of the other buyers. A look at the screenshots below will clarify this remark.
The seller is informed about her type. The seller chooses to accept or reject the offer. If the offer is accepted, the seller sees the current and all past offers and decides whether to accept or reject the offer. If the buyer sees a list of previously rejected offers, she decides whether to choose the seller's type or keep looking. For each offer, the buyer knows which seller made it.
Buyer's ID number

4th offer buyer 1. Since this is the
current buyer is
submits an offer. Here,
The current buyer

The buyers see all past

For each offer the

Buyer made it
Buyers know which

Other buyers are making
when making

On the left hand side all past offers of you and the offer buyers are listed. Recall that the seller as well as the offer buyers see a list identical to the one below.

This is period 1. You are a buyer.
[Treatment: Competitive Bargaining Private Offers]

We will now describe the general setting you will face during the experiment. The same decision situation (explained below) will be repeated for 10 periods. In each period there will be 3 groups, each consisting of 4 participants. More specifically, in each group there is 1 seller and 3 buyers. You will be one of these buyers or the seller. In each period new groups will be formed randomly. That is, the participants that are in the same group as you in one general change from period to period.

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\[
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\text{Seller's payoff} & = \text{Accepted Offer - Production Cost}
\end{align*}
\]

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A final important remark concerns your information about past offers. There will be a table listing all offers that were made by the buyers to the seller in previous stages. The table also shows who made the offer and in which stage. Only the seller sees this table. **Hence, the seller knows the past offers and who made them. On the other hand, buyers only see their own past offers, but not the offers of the other two buyers.** A look at the screenshots below will clarify this remark.
Buyer's ID number

Submit an offer

The current buyer

Note that this is buyer 1

Past offers

The buyer only knows his own offers made in stage 2 and 3.

Stage 4: He does not see the stage 4 offers made in stage 2 and 3. He does not see the stage 4 offers made in stage 2 and 3.

This is problem 1. You are a buyer.
Instructions Lottery Task

In the following part of the experiment, you will have the choice to participate in a lottery in which you can win or lose money. Any profits or losses will be added to your earnings from the previous part of the experiment and paid to you in cash at the end of the experiment.

On the next screen, you will see 6 different lotteries. For each lottery, you may choose to accept the lottery or to decline the lottery. After you have made a selection for each of the lotteries, one of the lotteries will be randomly selected by the computer. If you have decided to accept the selected lottery, the computer will determine whether you win or lose the lottery. The probability that you win the lottery is 50% for all 6 lotteries. If you chose to decline the selected lottery, nothing happens and your income will stay the same.

Lotteries

<table>
<thead>
<tr>
<th>Lottery</th>
<th>Decline</th>
<th>Accept</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. a 50% chance of winning 6 CHF and a 50% chance of losing 2 CHF.</td>
<td>Decline</td>
<td>Accept</td>
</tr>
<tr>
<td>2. a 50% chance of winning 5 CHF and a 50% chance of losing 3 CHF.</td>
<td>Decline</td>
<td>Accept</td>
</tr>
<tr>
<td>3. a 50% chance of winning 6 CHF and a 50% chance of losing 4 CHF.</td>
<td>Decline</td>
<td>Accept</td>
</tr>
<tr>
<td>4. a 50% chance of winning 6 CHF and a 50% chance of losing 5 CHF.</td>
<td>Decline</td>
<td>Accept</td>
</tr>
<tr>
<td>5. a 50% chance of winning 6 CHF and a 50% chance of losing 6 CHF.</td>
<td>Decline</td>
<td>Accept</td>
</tr>
<tr>
<td>6. a 50% chance of winning 6 CHF and a 50% chance of losing 7 CHF.</td>
<td>Decline</td>
<td>Accept</td>
</tr>
</tbody>
</table>