

## INSTRUCTIONS

*Introduction:* This is an experiment in the economics of decision-making. Funding for this project has been provided by the National Science Foundation and various other public funding agencies. If you read these instructions carefully and make good decisions, you might earn a considerable amount of money, which will be paid to you IN CASH at the end of today's session.

*Overview:* Today's session involves seller decisions in a market with posted prices. Each of you will be a seller. The session is divided into a series of *trading periods*. At the outset of each trading period, you are given unit costs. You can earn money by selling units at prices above costs. Your earnings are constrained by maximum unit prices that a buyer is willing to pay.

Trading proceeds as a two-step sequence: First you and the other sellers post prices, then a buyer makes purchases. Trading ends when the buyer has made all purchases possible, or when all sellers are out of units.

Incentives, market procedures and details specific to today's session are explained in the sections that follow

**1. Basic Incentives.** To see how you can make money in today's session, consider the cost schedules for a Seller A and a Seller B, along with the maximum unit values for a Buyer C, listed in Tables A, B and C, respectively in the upper portion of the Sample Information Sheet that has been placed immediately below these instructions in your folder (*Note: The sample information Sheet appears at the end of these instructions*). Please retrieve this sheet now.

*a) Seller Incentives.* Seller A may sell up to two units. As shown in column (2) of Table A, the first unit costs 2 cents, and the second unit costs 3 cents. Seller A earns profits by selling units at prices above unit costs. For your convenience the Total Costs of producing units are listed in column (3). The total cost of selling two units, for example, is 5 cents: 2 cents for the first unit plus 3 cents for the second unit.

Costs for a second seller, Seller B are shown in Table B. Like Seller A, Seller B may sell two up to 2 units. For Seller B the first unit costs 3 cents and the second unit costs 4 cents. Thus total costs for seller B are 3 cents for one unit, and 7 cents for two units. In today's experiment the number of units each seller may offer, as well as the cost of each unit may differ from seller to seller. Cost information is private and is not to be revealed.

*b) Buyer incentives.* The buyer has values for each unit, that determine maximum reservation prices. As indicated in Table C, the buyer in this example may purchase up to three units. The buyer will pay up to 9 cents for a first unit, up to 8 cents for a second unit, and up to 7 cents for a third unit.

**2. Market Procedures.** It is instructive to explain market procedures in terms of a sample period using the cost and value schedules shown in Tables A, B, and C, and the Sample Seller Decision Sheets printed at bottom of the Sample Information Sheet.

On the Sample Seller Decision Sheets, as for the Seller Decision Sheets to be used in today's session, information for each trading period is maintained on a separate row, as explained below. For now, enter information when instructed in the row for sample period 0.

*a) Pricing Decisions.* First sellers make price and maximum offer quantity decisions. This information is entered in columns (1a) and (1b) of the Sample Seller Decision Sheets.

Let us select prices for the sellers, starting with Seller A. Seller A may offer either one or two units, but

- all units must be offered at the same price.
- units are “made to order” in the sense that costs are incurred only when a unit sells. Sellers bear no costs for offered, but unsold units.

Select an offer price and maximum offer quantity for Seller A now, in light of the cost schedule in Table A. Record the decisions in the row marked “period 0” in the Sample Decision Sheet for Seller A.

\*\* The monitor publicly elicits an offer price and a maximum offer quantity.\*\*

Now, we select an offer price and maximum offer quantity for Seller B. Select an offer price for Seller B now, in light of the cost schedule in Table B. Record the decisions in the row marked “period 0” in the Sample Decision Sheet for Seller B.

\*\* The monitor publicly elicits an offer price and a maximum offer quantity.\*\*

Notice that unlike this trial period, sellers in the experiment, will not know each other's cost schedules, and sellers will not know the offer decisions of the other sellers prior to making their own decisions.

*b. The Shopping Sequence.* Next the monitor makes buyer-purchasing decisions in light of the unit values, listed in Table C. The buyer will approach first the seller posting the lowest price, and will buy as many units as is profitable. If additional profitable purchases may still be made after exhausting the quantity offered by the lowest pricing seller, the buyer will move to the seller with the next lowest price and make purchases. This process continues until either all sellers are out of units or the buyer has made all profitable purchases possible.

Once purchasing decisions are complete, the monitor will tell each seller the number of units he or she sold. Each seller record buying decisions as they are made in column (2a). Let us now review the buying decisions for the sample period.

**\*\* The monitor relates sales to each seller. This information is entered in column (2a) of the Sample Decision Sheets for Seller A and Seller B.\*\***

*c. Earnings.* Once sales decisions are complete, sellers calculate earnings, as follows.

i) Total Costs First find the Total Costs for Seller A by referring to column (3) of Table A. Record this information in column (2b) of Seller A's Sample Decision Sheet.

Now find Total Costs for Seller B in Table B, and record this information in column (2b) of Seller B's Sample Decision Sheet.

ii) Revenues. Second, sellers calculate revenues by multiplying the offer quantity (column 1b) by the quantity sold (column 2a). This information is entered in column (3a). Do this now for Sellers A and B on their Sample Decision Sheets.

iii) Earnings. Period Earnings are calculated by subtracting the Revenues (column (3a)) from Total Costs (column (2b)). This entry is recorded in column (3b). Do this now for Sellers A and B.

Finally, sellers maintain a record of total earnings in column (3c) by adding period earnings to their previous total.

In subsequent periods, the buyer and each of the sellers will be re-endowed with unit costs and unit values, and the price posting /purchasing process begins anew.

**Market Details:** Each of you will be a seller in today's experiment. You will retain the same identity throughout the session, as S1, S2, S3 or S4. To determine your seller identifier, look on the outside of your folder. You should write this on the top of every record sheet that you use in today's session.

Now we review some details specific to today's session. The session will proceed as outlined in the practice period, but with the following differences.

*a. Buyer valuations.* The maximum amount that the buyer is willing to pay for units will not be announced. However, in making purchasing decision the monitor will purchase all units that do not generate a loss for the buyer.

*b. Seller costs.*

*Set-cost sessions:*

Take out your cost schedule for the first portion of today's session. This information is given in Table 2. The Table is formatted as the cost schedules in Tables A and B. This information is private, and is to be revealed to no one.

*Endogeneous cost sessions:*

In today's experiment, your cost schedule will be handed to you by the monitor at the start of each period. Each period, the cost table is formatted as the cost schedules in Tables A and B. This information is private, and is to be revealed to no one. The monitor will hand out your cost schedule for period 1 now. \*\* Monitor Distributes Cost information \*\*

Your cost schedule will change in response to sales that you made in previous periods. In general, each time you make a sale, your costs for offering a unit will increase for the next three periods: In the next period, the cost for offering a unit will be much higher. In the subsequent two periods, costs will fall and in the fourth period costs will return to the initial period level. (You might view this as though you were selling some type of service. When you sell a "unit" that unit is busy for the next three periods --albeit, decreasingly so)

Notice that this cost information is formatted as the cost schedules in Tables A and B. This information is private, and is to be revealed to no one.

*c. Tie Breaking Rules:*

*Rotating Purchase Rule:*

In the event two or more sellers post the same price in a period, the monitor will roll a die to determine the order in which the buyer will approach the sellers. The buyer will then rotate purchases from the tied sellers in the randomly determined order, until as many units as profitable have been purchased, or until all tied sellers are out of units.

*Fixed Purchase Rule:* In the event two or more sellers post the same price in a period, the monitor will roll a die to determine who will be approached first by the buyer. The monitor will make as many purchases as possible from the selected seller, and then will approach the other seller in the event that profitable purchases may still be made after the initially select seller has sold all offered units.

*d. Public Information.*

*Full Information Condition:* Each period the monitor will publicly announce both each seller's price, as well as the number of units subsequently sold by each seller.

*No Information Condition:* Each period the monitor will publicly announce each seller's bid price. Neither the number of units offered, nor the number of units sold by a seller will be publicly announced.

*e. Session Structure.* This session will consist of two parts. After an unannounced number of periods, there will be a regime change, and new cost schedules will be passed around to each of you. The market will continue in the new regime for an unannounced number of periods.

*f. Discussion opportunities (Communications sessions only):* At the outset of each period, we give you the opportunity to talk among yourselves about the market. You are free to discuss all aspects of the market, with three exceptions: (a) you may not discuss side payments or make physical threats, (b) you may not discuss quantitative information about your costs, or the maximum number of units you have available, and (c) you may not discuss any actions you took in the previous periods that were not directly observable by the other sellers. (Pricing decisions, you will recall, are public information. On the other hand, quantity postings and actual sales quantity are private). You may discuss any other aspect of the market. In particular, you may discuss what you think is an appropriate action for the next period, but you may not discuss what you did in the previous period other than to indicate that you were either pleased or not pleased with the outcome. You may make agreements among yourselves. However, note that you are in no way bound to the terms of any such arrangements when actually making offer decisions.

You will have a maximum of three minutes to talk. After receiving the signal to stop talking, please maintain strict silence. Also, if you return to your desks to make price/quantity decisions, prior to the expiration of the three minute deadline, you may no longer communicate.

*g. Payment.* At the end of the session, you will be paid the sum of your earnings in the laboratory on a penny for penny basis. Your cash payment will be the sum of your earnings in the session, plus your \$6 appearance fee.

Are there any questions? If not, we will proceed to the first trading period.

*(Note: After period 20 the following message was read)*

### **Announcement**

For the remainder of today's experiment. The following new rule will be used by the buyer to purchase units from sellers posting the same price.

*Then a second short paragraph, announcing a new tie-breaking rule, or a new information condition was read, as appropriate (See paragraphs c and d above)*

## Sample Information Sheet

### A. Sample Cost Information

Table A: Cost Schedule for Seller A

(1) Unit	(2) Unit Cost	(3) Total Cost
0	0	0
1	2	2
2	3	5

Table B: Cost Schedule for Seller B

(1) Unit	(2) Unit Cost	(3) Total Cost
0	0	0
1	3	3
2	4	7

### B. Sample Value Information

Table C Unit Values.

(1) Unit	(2) Value
1	9
2	8
3	7

### C. Sample Seller Decision Sheets

Seller Decision Sheet: Seller A.							
Pd.	(1) Posting Decisions		(2) Sales		(3) Earnings		
	(1a) Price	(1b) Offer Qty.	(2a) Quantity Sold	(2b) Total Cost (from Table A)	(3a) Revenue (1a)*(2a)	(3b) Per. Earnings (3a)-(2b)	(3c) Total Earnings
0							

Seller Decision Sheet: Seller B.							
Pd.	(1) Posting Decisions		(2) Sales		(3) Earnings		
	(1a) Price	(1b) Offer Qty.	(2a) Quantity Sold	(2b) Total Cost (from Table B)	(3a) Revenue (1a)*(2a)	(3b) Per. Earnings (3a)-(2b)	(3c) Total Earnings
0							

Sample Cost Schedules (Set Cost Design)

Cost Schedule. Seller 1.

(1) Unit	(2) Unit Cost	(3) Total Cost
1	80	80
2	125	205
3	155	360
4	170	530

Cost Schedule. Seller 2.

(1) Unit	(2) Unit Cost	(3) Total Cost
1	80	80
2	125	205
3	155	360
4	170	530

Cost Schedule. Seller 3.

(1) Unit	(2) Unit Cost	(3) Total Cost
1	80	80
2	125	205
3	155	360
4	170	530

Cost Schedule. Seller 4.

(1) Unit	(2) Unit Cost	(3) Total Cost
1	80	80
2	125	205
3	155	360
4	170	530



