

Appendix A. Experiment Instructions

Instructions for the first 10 paying periods [same for all treatments]

- ***General***

Thank you for coming! You've earned \$5 for participating, and the instructions explain how you can make decisions and earn more money which will be paid to you in cash.

This is an experiment in the economics of market decision making. In this experiment we are going to simulate a market in which each participant will be a buyer in a sequence of trading periods.

There should be no talking at any time during this experiment. If you have a question, please raise your hand, and an experimenter will assist you.

During the experiment your earnings will be calculated in experimental points. Experimental points will be converted into Dollars at the following exchange rate:

$$200 \text{ experimental points} = \$1$$

At the end of today's experiment you will receive, in cash, the earnings you make today. In addition, you will receive a payment certificate to pick up your \$5 participation bonus and an additional cash payment of \$18 the same day next week.

For example, if today is Monday, you will receive the \$5 participation bonus and the additional \$18 cash payment next Monday. To pick up these amounts, you need to come back to the same lab the same day next week (if you cannot make it at the time indicated on your payment certificate please send an email to lingbo.huang@monash.edu to schedule another time on the same day or you can send someone else to pick up your cash payment on the same day). You do not need to participate in any decision task next week to receive the additional \$18 payment.

However, as we describe below, you may lose some of this \$18 depending on the decisions you and the other three buyers in your market make today. Therefore, the final amount of the additional cash payment you will pick up next week will depend on the decisions you and the other three buyers in your market make in today's experiment.

In today's experiment, you will first participate in two practice trading periods followed by a number of paid trading periods. In the practice trading periods you do not earn money, but you should take these periods seriously since you will gain valuable experience for the paid trading periods.

- ***Specific instructions to buyers***

In this experiment each participant is a buyer. Each buyer is randomly assigned to a group of 4 buyers – a market – and remains in the same market with the same buyers throughout the experiment. What is happening in other markets is irrelevant for your own market and hence for your own earnings. During each trading period each buyer can buy units (up to 3 units) of a hypothetical consumption good from an automated (computerized) seller.

Resale value of a unit. At the beginning of each trading period, you will be given three separate resale values for each of the three units of the good you can purchase. These are your privately known resale values. You can think of the resale value of a unit as the potential earnings you can make out of that unit. Your resale values will remain the same in each period during the experiment.

Bid. As a buyer, you can submit a “bid” to buy a unit from the seller during a trading period. A “bid” is the amount you are willing to pay for that unit of the good. You must submit one “bid” for each of the three units. (If you do not want to purchase a unit, you may simply submit a bid “0”.) Your bids must follow these two rules: 1) “Trade at no loss”: your bid for each unit cannot be above your resale value for that unit; 2) Your bid for the third unit cannot exceed your bid for the second unit, and your bid for the second unit cannot exceed your bid for the first unit.

- ***How the market works***

At the beginning of each trading period each buyer submits bids for each unit offered in the market. At the end of each trading period, all submitted bids are collected and ranked from high to low. If two or more bids are equal, ranks will be randomly assigned by the computer.

1. ***How the Market Price is determined***

The automated seller has a production cost unknown to all buyers. The production cost does not change during the experiment. The seller never trades at a loss, therefore it will not accept bids below its production cost. The seller will accept, among all bids from all buyers in the market, the lowest bid above or equal to the production cost. This will be the per-unit **Market Price**. Bids that are below the production cost will be rejected and buyers who have submitted those bids won’t buy any units (i.e. buyers will neither pay for those units they placed a bid on nor gain any resale value from those units).

The market price can be different in each period because it depends on the bids that are submitted in each period.

2. ***How the Market Quantity is determined***

Buyers will purchase a unit when their bid is greater than or equal to the market price. The **Market Quantity** is the total number of units purchased by the 4 buyers in one market in one period at the market price.

Example: Suppose, in one market and in one trading period, the automated seller's production cost is 70. And suppose the automated seller collects the following bids from the 4 buyers.

	Buyer 1	Buyer 2	Buyer 3	Buyer 4
Bid Unit 1	135	135	140	145
Bid Unit 2	85	90	94	85
Bid Unit 3	80	0	80	40

The bids are ranked from high to low as follows: 145, 140, 135, 135, 94, 90, 85, 85, 80, 80, 40, 0. In this case, the **Market Price is 80** (the lowest bid above the production cost of 70). All 10, and only the 10 units for which the bids were equal or above the market price of 80 will be purchased by the buyers who submitted the corresponding bids. These 10 sold units are bolded in the table. Each of these 10 units will be exchanged at 80. The market quantity in this case is 10. The number of sold units is determined by the number of submitted bids above or equal to the market price. Units for which the submitted bids are below the market price will not be sold.

Please note: The information on values and production costs of a unit is private. Buyers do not know the bids of other buyers, nor do they know the per-unit production cost for the seller.

3. *Additional Costs from Trading*

Each unit traded in the market (i.e. each unit sold) causes an additional cost of 60 points that will be equally split by the 4 buyers in the market. This means that each of the 4 buyers in the market has to pay an additional cost of $60/4=15$ points. **Note** that you will bear a share of the additional costs even if you do not buy any units yourself.

Using the example above where the market quantity is 10 units, in this case, each buyer incurs an additional cost of $(60/4)*10=150$ points=\$0.75.

These additional costs will not affect your earnings today but will be deducted from the \$18 cash payment you will receive next week.

4. *How your earnings today in each trading period are calculated*

Your Final earnings in one trading period = (Resale value - Market price) of each unit purchased

In the example above Buyer 4 buys two units. Her resale value for Unit 1 is 200, her resale value for Unit 2 is 140 and her resale value for Unit 3 is 100. The market price is 80. Her **Final earnings** in this period = 200 (resale value of Unit 1) + 140 (resale value of Unit 2) – 2*80 (market price) = 340 – 160 = 180.

As you can see, in this case, even though Buyer 4's resale value for Unit 3 is 100, which is higher than the market price 80, Buyer 4 did not purchase the unit because her bid for Unit 3 (40) is lower than the market price (80).

Your total Final earnings for today are the sum of your Final earnings in each trading period over all the paid trading periods.

5. How your earnings next week are calculated

Each participant will receive \$18 next week. However, the final amount of the cash payment you will pick up next week will depend on the decisions you and the other 3 buyers in your market make today.

In the example above, since the market quantity is 10, the additional costs per person are $(60/4)*10 = 150$ points. This additional cost will be deducted from Buyer 4's cash payment for the next week.

So, the **final payment each buyer will receive next week = \$18 - the Sum of the Additional Cost per person in each period today.**

You do not need to participate in any decision task next week to receive the cash payment for the next week. You just need to pick it up in the lab on the same day next week.

At the end of each round, the participants see the following screen displaying their bids for each unit; their final earnings in that round; their profit to be received at the end of the experimental session up to that round; their profit to be received one week after the experiment up to that round.

Period 1		Remaining time [sec]: 26		
History of Results by Period				
Period	Market Price	Market Quantity	Number of Units YOU purchased	Your Final Earnings
Practice	40	12	3	220
Practice	40	12	3	220
1	40	12	3	220
Outcome of this Period				
		Your bid for Unit 1	40	
		Your bid for Unit 2	40	
		Your bid for Unit 3	40	
		Your Final Earnings	220	
Your Balance Today as of now			Your Balance Next Week as of now	
Previous Balance (1)			3600	
Final Earnings of this Period (2)			720	
Balance (1)+(2)			Additional Costs per person (2)	
220			180	
			Balance (1) - (2)	
			3420	
Next				

Instructions for the next 10 periods

[same for all treatments]

You and the other three participants in your market will now vote whether to introduce a tax of 60 points on each purchased unit of the good. If at least two out of four buyers in each market vote “Yes”, the tax is accepted and the following changes are implemented for the following trading periods: 1) a tax of 60 points will be deducted from your final earnings for each unit you purchase; 2) at the end of each period, an equal share (one-fourth) of the total tax revenues collected from all units traded in your market will be returned to each buyer. All the other rules described in the instructions for the first 10 trading periods remain the same. In particular, the seller’s production cost and each buyer’s resale value of each unit remain the same as the previous 10 periods.

Example

Suppose the tax of 60 points per unit is accepted as the outcome of the voting in your market.

To illustrate how this would affect the outcome of the market and your earnings we use the same example from the instructions for the first 10 trading periods. In that example, when a buyer obtains one unit of the good, she will receive her resale value but now she will also have to pay the tax of 60 points. Consider Buyer 4. Buyer 4’s resale value for Unit 1 is 200, her resale value for Unit 2 is 140 and her resale value for Unit 3 is 100. Since buyer 4 will also have to pay the tax of 60 points on each purchased unit, the maximum she could pay to the seller and still make a gain is $(200 - 60) = 140$ for Unit 1, $(140 - 60) = 80$ for Unit 2 and $(100 - 60) = 40$ for Unit 3.

Consider again the example in which the seller collects the following bids from the 4 buyers. Let’s assume each buyer bids 60 less than before for each unit due to the tax she has to pay for each purchased unit.

	Buyer 1	Buyer 2	Buyer 3	Buyer 4
Bid Unit 1	$(135 - 60) = 75$	$(135 - 60) = 75$	$(140 - 60) = 80$	$(145 - 60) = 85$
Bid Unit 2	$(85 - 60) = 25$	$(90 - 60) = 30$	$(94 - 60) = 34$	$(85 - 60) = 25$
Bid Unit 3	$(80 - 60) = 20$	0	$(80 - 60) = 20$	0

The bids are ranked from high to low as follows: 85, 80, 75, 75, 34, 30, 25, 25, 20, 20, 0, 0. Again, suppose the automated seller’s production cost is 70. Thus, the Market price is 75 (that is, the lowest bid above 70). The Market quantity is 4. These 4 sold units are bolded in the table. Following the same rule as in the first 10 trading periods, each of these 4 units will be traded at the Market price 75.

To illustrate how a buyer's earnings today are calculated, again let's use the example of Buyer 4. Since the Market price is 75, Buyer 4 buys 1 unit. Since 4 units are sold, the total tax revenues in this period are $4 \times 60 = 240$. One fourth of the total tax revenues, $240/4 = 60$ points will be returned to buyer 4.

Buyer 4's **Final earnings** in this period are $= 200$ (resale value of unit 1) $- 60$ (tax) $- 75$ (market price) $+ 60$ (returned tax revenues) $= 125$.

Since the Market quantity is now 4, in this period the **Additional costs per person** are $(60/4) \times 4 = 60$ points. These additional costs will not affect Buyer 4's earnings today but will be deducted from the \$18 cash payment Buyer 4 will receive next week.

So, the final **cash payment each buyer will receive next week** $= \$18$ - the sum of the **Additional Cost per person in each period**.

Suppose the tax proposal is rejected.

Trading will continue as before the vote and no changes will apply. Thus, in the above example, the seller will only accept bids above or equal to the production cost 70. The Market price is therefore 80. Buyer 4 buys two units. Her final earnings for that period is 180.

Since the Market quantity is 10, in this period the additional costs per person are $(60/4) \times 10 = 150$ points. Again, these additional costs will be deducted from the cash payment Buyer 4 will receive next week. All final earnings in the following periods will be calculated as illustrated above.

[Self-Nomination (Asymmetric Information), *italicized* paragraph]

Additional information about how tax would affect your earnings is available. Some but not all buyers will receive this additional information. Whether one buyer will receive the information or not is randomly determined by the computer and will be shown on your screen before proceeding to the voting (see below for details of the procedure).

Voting procedure

[No First Voter]

In the ballot, all participants simultaneously vote Yes or No for the introduction of the tax. Abstentions or neutral votes are not possible.

[Self-Nomination and Self-Nomination (Asymmetric Information)]

When voting on the tax, one member in your group will vote first and write a message to the other three members explaining why she voted Yes or No to the introduction of the tax. The other three members will see the result of the first vote and the message, and then decide whether to vote Yes or No to the introduction of the tax. Abstentions or neutral votes are not possible.

To decide who will vote first, every member in your group will be asked to state whether he/she wants to be the first voter or not.

- If only one member wants to be the first voter, then this member will be the first voter.
- If more than one member wants to be the first voter, then one of them will be randomly selected to be the first voter.
- If no one wants to be the first voter, then one member in your group will be randomly selected to be the first voter.

[same for all treatments]

You will be informed about the outcome of the vote in your group on the screen before the trading continues. All decisions are anonymous.

Before proceeding to the vote you will be asked to do an exercise to make sure you understand the instructions.

If you now have questions, please, raise your hand and wait until an experimenter comes by to answer your questions individually.