Econ 201: Introduction to Economics Analysis

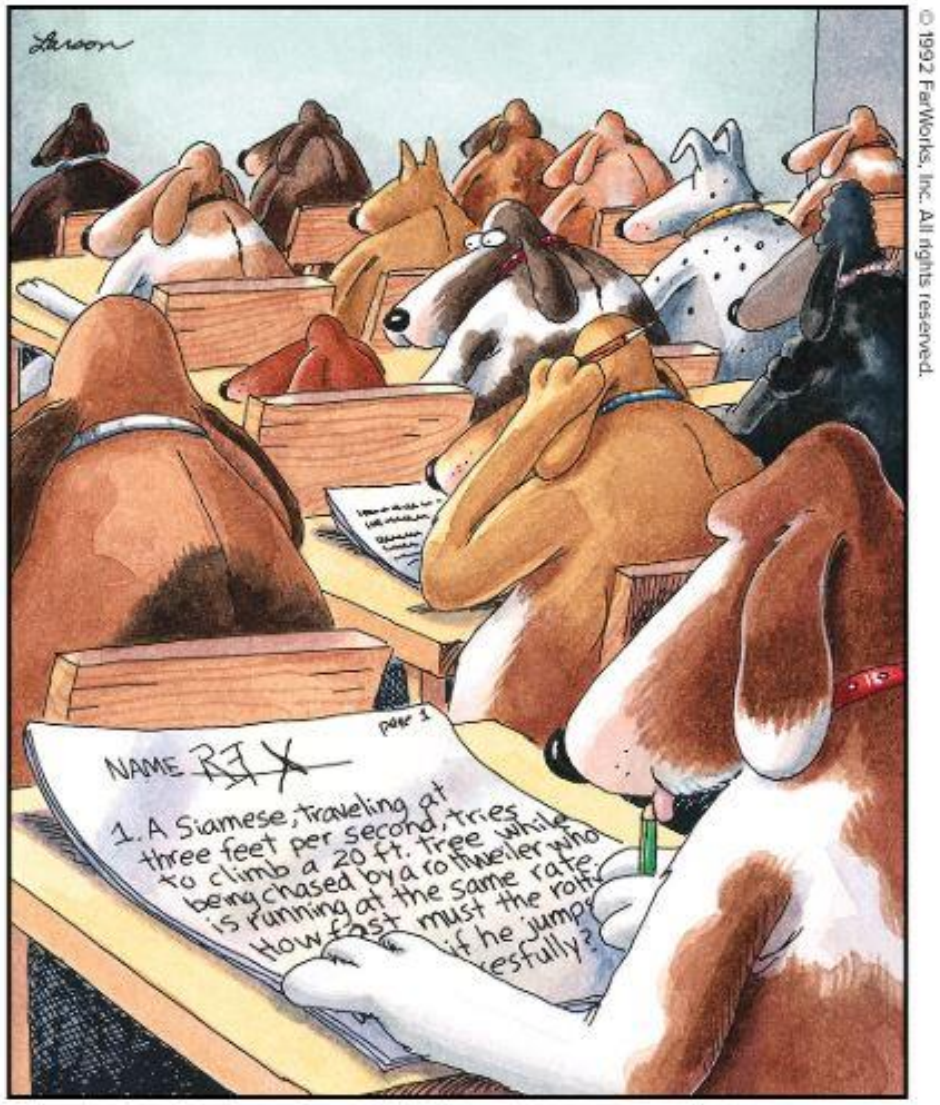
September 9 Lecture: Preparation for Double-Auction Experiment

Jeffrey Parker
Reed College

Daily dose of The Far Side

Dogs and cats are a common theme at The Far Side, and in my corner of the Economics Department

www.thefarside.com



Before their admission to any canine university, dogs must first do well on the CATs.

Preview of this class session

- This class session will be an interactive auction experiment, done in the conference session on September 9
- This lecture and the slides will provide information about the experiment and instructions on how to participate
- Two major requests:
  1. **If you know that you need to miss class on Wednesday, please tell me ASAP**
  2. **Please be on time for class**
- The experiment needs to be set up for a specific number of students and it is very difficult to adjust this once we start. I will plan for full attendance unless I hear that you won't be attending. If we end up with fewer, it will make your analysis more difficult on Problem Set #2.

What is an economics experiment?

- Construct artificial laboratory situation to test economic hypotheses
- Run experiment (with human participants) and collect data on outcomes
  - Interaction can be in person or online
  - In our case, online
- Compare outcomes to the predictions of the hypothesis
  - Are they consistent?
  - If not, is the theory wrong or does the setup of the experiment not accurately reflect the theory?

Market institutions

- Common early application of experiments: **test implications of perfect competition**
- In most modern economies, prices are posted by sellers and buyers decide how much to buy
  - **Posted-offer** market institution
- Many experiments utilize auction setups
  - Antiques markets use **English auctions**, where buyers bid up price
  - **Dutch auctions** work the other way: price starts high and auctioneer drops until someone is willing to buy
  - We will use a **double auction** institution, in which both buyers and sellers can call out prices and/or accept a transaction from the other side

Double auctions

- In an experimental double auction, participants are **buyers or sellers**
  - Each buyer is given a **value** for each unit bought (first purchase, second, etc., with value usually declining as more is bought)
  - Each seller has a given **cost** for each unit sold (first unit usually has lower cost than second, etc.)
- In a double-oral auction, interaction is oral and face-to-face with buyers calling out bids and sellers calling out offers
  - Not feasible in pandemic
- Our interaction will be an online version (VEconLab) published by Charles Holt at the University of Virginia

Experiment in Econ 201

- Online double auction is designed to be similar to competitive market
- Perform experiments on September 9
- I prepare summary of results and post by September 11
- Problem Set #2 will ask you to analyze the results of your experiment and evaluate them in comparison to the predictions of the competitive model
  - To facilitate the analysis, you can work on this assignment in (pre-assigned) pairs, submitting a single collaborative paper
  - If communication with your partner becomes too difficult due to pandemic, it is OK for both to submit separate analyses
- Class on September 16 (when the assignment is due) will be a discussion of the results

Instructions for Experiment

Getting ready for the experiment

- Prepare yourself by viewing/reading the instructions that follow
  - We will do these again together at the start of the experiment
- You will need to have a browser window open for the experiment along with Zoom, so that we can interact together
- Point your browser to the following URL, which is also on the reading list entry for today:
  - http://veconlab.econ.virginia.edu/login.htm

Logging in (Part 1)

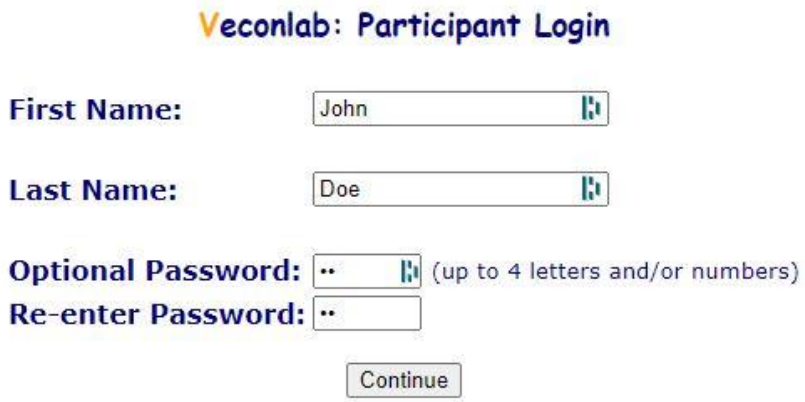
- You should see the screen below
- Click Login to start
- Use the Emergency Restart button to get back in if disconnected

Logging in (Part 2)

- Next, you need to enter the Session Name
- The name will be rcjp#, where # is a number that I will give you via Zoom

Logging in (Part 3)

- Next you will enter your name and a password (keep it simple)
- You can use the password to reconnect in case of trouble



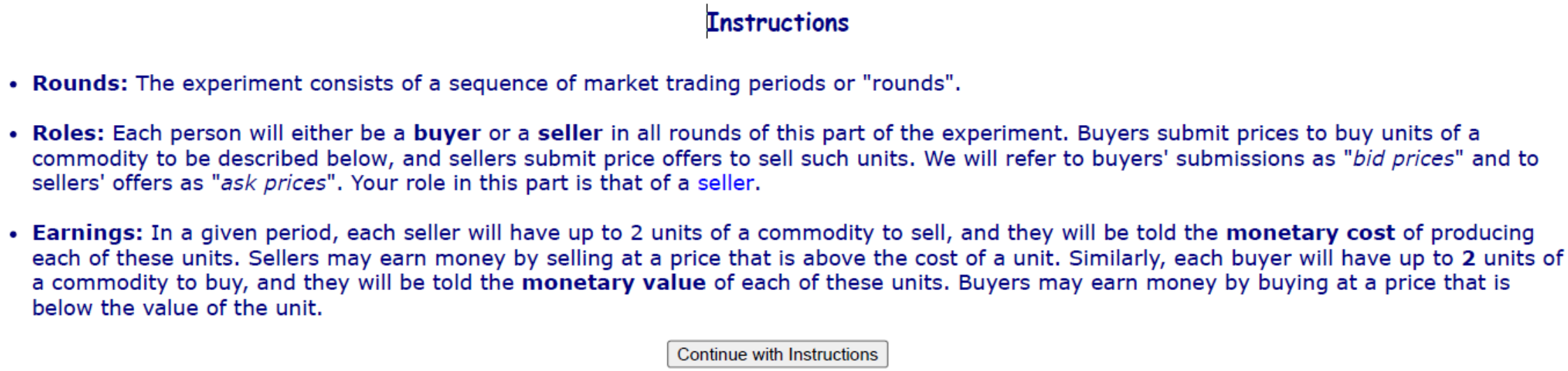
- **ID:** You will be assigned an ID number that will be used instead of your name in the experiment. You will need your ID number to log in at a later time to check results and resume trading.
- **Password:** This will be needed when you log in later again to resume activity. The password prevents someone else from logging in as you and making offers to buy or sell from your portfolio.

Confirming your login

- At this point, VEconLab will assign you an ID number and confirm your password
- Be sure to write both of these down so that you have them to reconnect, if necessary

Starting the instructions

- Please wait until we are all ready to click the “Continue with instructions” button so that we can go through them together. Once you click, you will get this screen. We’ll go through together, so wait to continue



Instructions, Page 2

- This page tells you whether you are a buyer or seller
- John Doe is assigned to be a seller here

Instructions, ID = 3, Page 2 of 9

- **Your Role:** Seller. For each unit that you sell, you will earn the difference between the selling price of the unit and your cost for that unit. So high prices and low costs are good for sellers like you. The costs for your 2 units will be given to you, and the determination of price is explained next.
- **Bid and Ask Prices:** When the market opens, any buyer may submit a bid price at which he or she is willing to purchase a unit. Similarly, any seller may submit an offer (or "ask") price at which he or she is willing to sell a unit.
- **Transactions:** A transaction is finalized when a buyer accepts a seller's offer, or when a seller accepts a buyer's bid.

Continue with Instructions

Instructions, Page 3

Making Bids and Offers, ID = 3, Page 3 of 9

- **Bid-Ask Spread:** At all times the program will display the highest outstanding bid to buy and the lowest outstanding offer to sell. The lowest offer will be above the highest bid, and the difference will be called the "bid-ask spread".
- **Bid and Ask Revisions:** A new bid from a buyer need not be above the buyer's own outstanding bid (if any) for that unit. Similarly, a new ask from a seller need not be below the seller's own outstanding offer (if any) for a particular unit. The option to adjust one's own bid or ask in either direction permits one to correct an error or essentially withdraw a bid (by lowering it) or withdraw an ask (by raising it).
- **Making a Purchase or Sale:** A buyer can make a purchase by offering to pay a seller's price, i.e. by entering a bid that is at or above a seller's ask price. Similarly, a seller can make a sale by entering an offer that is at or below a buyer's bid price.
- **Resubmission of Bids or Offers:** A transaction automatically cancels all prior bids and offers made by the buyer and seller involved, although they are free to enter new bids and offers if they have additional units to buy or sell. Bids and offers made by those who are not involved in the transaction do not have to be reentered; they remain in the queue.

Continue

Instructions, Page 4

Instructions, ID = 3, Page 4 of 9

- **Example 1:** Suppose buyer 1 makes a bid of 1 and seller 3 makes an offer of 3. The next message could be **either** a new bid (from buyer 1 or from another buyer) **or** a new offer (from seller 3 or from another seller). Suppose that buyer 2 first bids 1.5 and then raises that to 2, and seller 4 accepts by making an offer at 2. Then both of buyer 2's bids would be removed, and the highest available bid would be buyer 1's original bid of 1. Seller 3's offer of 3 would still stand and would represent the lowest offer at that point.

- **Example 1 (continued):** When seller 4 sells to buyer 2 at a price of 2, each of them will earn money. If buyer 2's value for the unit were 6, then the buyer would earn 6 - 2 = 4. Similarly, if seller 4's cost were 1, then the seller would earn 2 - 1 = 1 on the sale. The buyer would not have been permitted to pay more than 6 for the unit with a value of 6, and the seller would not have been permitted to sell at a price below the cost of 1.

- **Subsequent Units:** If seller 4 were to have a second unit with a cost of 2, the seller's next offer would have to be at least 2. In contrast, seller 1 who did not yet sell the unit with a cost of 1 would be able to submit any offer that is greater than 1. So you see that some sellers may be trying to sell their first units at the same time that others are trying to sell their second units. Similarly, a buyer who makes a purchase and who has an additional unit value will be required to bid below the value of that second unit.

Continue

Instructions, Page 5 (Seller)

Instructions, ID = 3, Page 5 of 9

- **Costs:** In this market, you are a seller with 2 units that can be sold. The costs for these units are shown in the table below. For example, the first unit has a cost of **$2.00**.
- **Earnings:**. The first unit that you sell will yield money earnings of **sale price minus $2.00**. Of course, if a unit is not sold, no price is received, but no cost is incurred.

	cost	ask	price	earnings
unit 1	$2.00		$	$
unit 2	$2.00		$	$

Continue

Instructions, Page 6 (Seller)

Instructions, ID = 3 (Page 6 of 9)

- **Earnings:** Suppose that you made an offer of $10.56 on the first unit, and that this offer was accepted by a buyer. Then the number in the price column would be the same as the number in the ask column, and the associated earnings would be calculated to be $10.56 - $2.00, as shown in the right-hand earnings column below. Earnings are listed as $0.00 on all unsold units.
- **Ask Prices:**. You enter your ask price in the ask column (try typing in a number, with a decimal to distinguish dollars and cents). Ask prices may differ for each unit, but must not be below the cost for that unit. You must sell your first unit before your second, etc., so you will see a submit box in the **ask** column for the next available unit (unit 2 in this example).

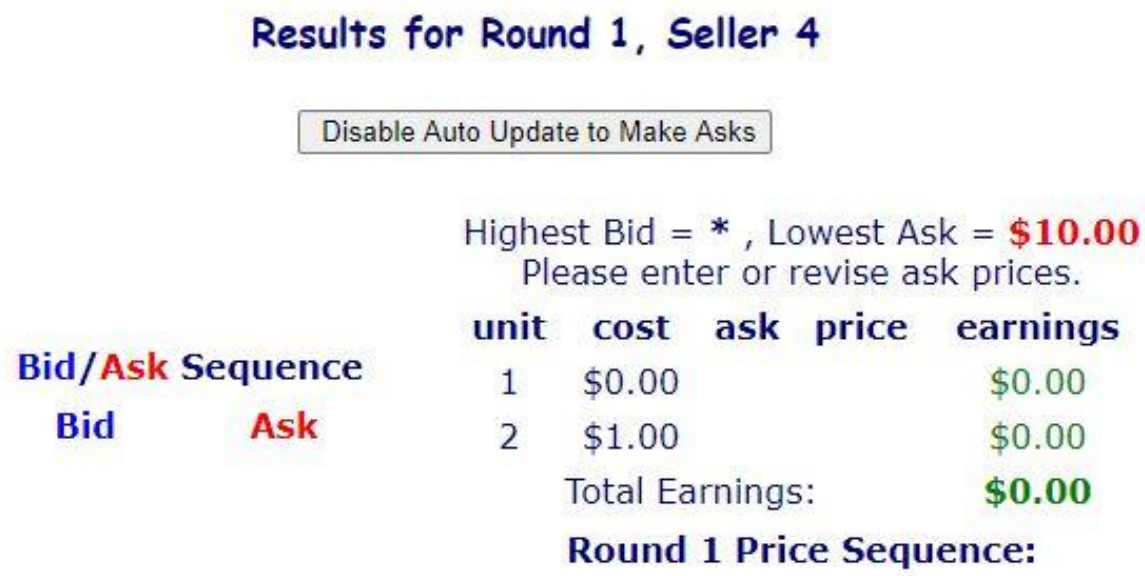
	cost	ask	price	earnings
unit 1	$2.00	$10.56	$10.56	$8.56
unit 2	$2.00			$0.00
unit 2	$2.00			$0.00

Continue

After this screen, there will be a two-question quiz and a final summary screen

Starting Round 1

Once I start Round 1 starts, you will see this



As a seller you can enter “Ask” offers if you click the button

Entering a bid/offer

Making a transaction

Rounds and treatments

- Your values/costs will change from round to round, but the class distribution will not
- Some buyers/sellers will have high values/costs and some low, but the overall distribution of values and costs remain the same
- I may introduce taxes (which sellers' would have to add to their costs), price controls, or other variations as we move from round to round
- Part way through the experiment, we will move to "Treatment 2," in which the distribution of prices and costs *will* change

Questions?

- If you have questions, I will try to answer them at the end of the instruction on Wednesday

- Or you can send me an email before that and I'll try to clarify

Daily diversion

In preparing an Excel file to record your grades, I merged the two classes and sorted alphabetically. As I was reading assignments (in alphabetical order), I looked to find the alphabetical median (because I wanted to know when I was halfway done).

With 42 students, the median is halfway between #21 and #22, which are (Unda) March and (Gabriel) May. So halfway between March and May is … April?

What comes next?

- After this experiment, we study elasticity on Friday and applications of the competitive model in Monday

- Monday's class is particularly useful in analyzing the experiment, so you might want to view that lecture in advance to help you on Problem Set #2

- There is a case study on the elasticity of demand for Reed and other colleges for Friday