

EXPERIMENTAL ECONOMICS

LAB REPORT #1

*Due Tuesday, February 11 in print at the beginning of our class.
Late submissions will **NOT** be accepted.*

In this experiment, we simulated a market in which **15 buyers** and **15 sellers** submitted bids and offers in any order. This trading institution is called a **double auction** because bids tend to increase as in an English auction (e.g. for antiques), and at the same time, offers tend to decrease. Thus, the bid-ask spread narrows until one of the bids or offers is accepted.

The experiment was conducted for a total of **9 periods/rounds** (**6 periods** in **treatment 1** and **3 periods** in **treatment 2**). Each Seller had **3 units** to sell, and each buyer could buy **3 units**.

Seller costs for each unit and buyer values for each unit were drawn randomly and independently from uniform distributions. All values and costs were randomly determined once for all rounds.

In rounds 1-6, Seller **costs** varied between **\$2 and \$8** and buyer **values** varied between **\$4 and \$9**.

In particular, in every trading period each buyer's unit value and each seller's unit cost were drawn from the following distributions:

Seller costs: [\$2, \$2, \$2, \$3, \$3, \$3, \$3, \$3, \$4, \$4, \$4, \$4, \$4, \$4, \$4, \$4, \$4, \$4, \$5, \$5, \$5, \$5, \$5, \$5, \$5, \$5, \$5, \$6, \$6, \$6, \$6, \$6, \$7, \$7, \$7, \$7, \$7, \$8, \$8, \$8, \$8, \$8, \$8]

This can also be represented as → Seller costs: [3x \$2, 5x \$3, 10x \$4, 9x \$5, 7x \$6, 5x \$7, 6x \$8]

[Hint: one possibility is to think as follows: if price = \$2, one seller is willing to supply three units; if price = \$3, sellers are willing to supply five extra units; if price = \$4, sellers are willing to supply ten extra units; and so forth. Think of bakers: if the price for bread increases from \$2 to \$3, they will work an extra hour to be able to sell more bread and increase profits, given costs stay constant. If the price further increases to \$4, they will work two extra hours to sell even more.]

Buyer values: [3x \$9, 9x \$8, 7x \$7, 10x \$6, 11x \$5, 5x \$4]

[Hint: one possibility is to think similar to supply above, but now from the demand side. As a buyer you want to have a discount if you buy, for example, not only one desk chair but also a second one. When the seller talks you into buying even a third chair, she would have to offer you at least the same discount or even more discount than you were already granted for the second chair.]

THEORETICAL QUESTIONS

1. Using the information about costs and values, draw the theoretical demand and supply curves in a graph. Please label the horizontal axis 'quantity' and the vertical axis 'price'.
2. Write down the theoretical predictions, i.e., the equilibrium price and quantity. What is the total theoretical consumer and producer surplus? What is the market efficiency in this case? *[Hint: one way to measure the efficiency of a market is to compare the actual earnings of all subjects with the maximum possible earnings]*

EMPIRICAL QUESTIONS

Both the data file and the instructions for participants in the Experiment can be found on Fenix.

Please note that the 15 Buyers have IDs from '1' until '15' and the 15 Sellers have IDs from '16' until '30'. In the data, the variable "status" refers to the status of the trade, "t" means that a trade did take place; "i" means the initial value or cost; "c" stands for canceled, meaning that a bid/offer was made but was not implemented.

3. Fill in the following table:

Round	Quantity per round = N	Average price
1		
2		
3		
4		
5		
6		

4. Compute:

a) The market efficiency [Hint: one way to measure the efficiency of a market is to compare the actual earnings of all participants with the **maximum possible earnings (total surplus).**]

Round	Market efficiency
1	
2	
3	
4	
5	
6	

b) A dispersion measure of market prices $p_i, i \in \{1, 2, \dots, N\}$ with respect to the equilibrium price p^* . [Hint: use the formula of variance: $\sigma^2 = \left[\sqrt{\frac{(p_1 - p^*)^2 + \dots + (p_N - p^*)^2}{N}} \right]^2$. Comment on the price dispersion across rounds.]

Round	Price dispersion
1	
2	
3	
4	
5	
6	

In round 7, there was an inflation shock to the economy which made costs and values increase by \$2. Thus, in trading rounds 7, 8, and 9, each buyer's unit value and each seller's unit cost were drawn from the same distributions as before with the only difference that \$2 had been added to all values and all costs. Thus, the distributions are now

Seller costs: [3x \$4, 5x \$5, 10x \$6, 9x \$7, 7x \$8, 5x \$9, 6x \$10]

Buyer values: [3x \$11, 9x \$10, 7x \$9, 10x \$8, 11x \$7, 5x \$6]

5. What is the effect of this tax on the supply curve? And on the demand curve? Write down the new equilibrium price and quantity.
6. Repeat questions 3 and 4 for periods 7 to 9.

Round	Quantity per round	Average price	Market efficiency	Price dispersion
7				
8				
9				