

Economics 201

Fall 2016

Double-Oral Auction
Experiments

Results and Analysis

Design of the Experiment

- ◆ Buyers could buy one widget at price less than or equal to given value.
- ◆ Sellers could sell one widget at price greater than or equal to given cost.
- ◆ Buyers and sellers interacted in double-or-al auction market.
- ◆ Transaction prices posted in real time.

Is market perfectly competitive?

- ◆ All buyers & sellers are small part of market?
- ◆ Homogeneous product?
- ◆ Perfect information?
- ◆ Price adjusts to equilibrium instantaneously?
- ◆ Free entry? (not relevant here)



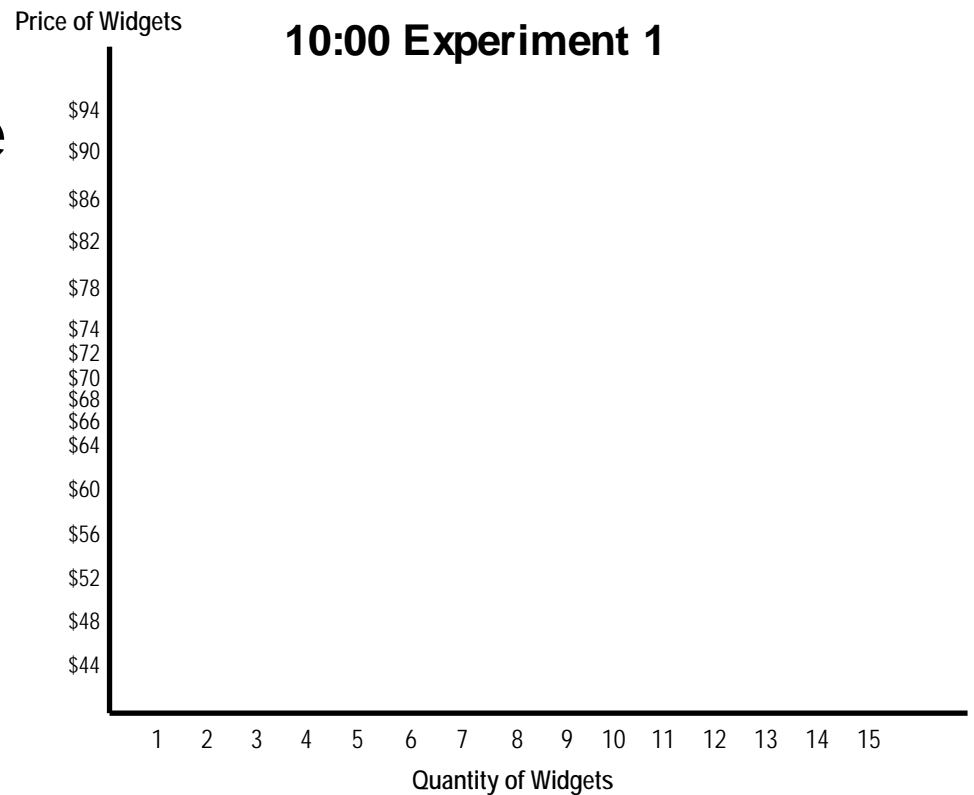
What was the demand curve?



Demand curve asks the question: “How many widgets would buyers have bought if they had been available for purchase at $\$X$?” Repeats the question for various values of $\$X$.

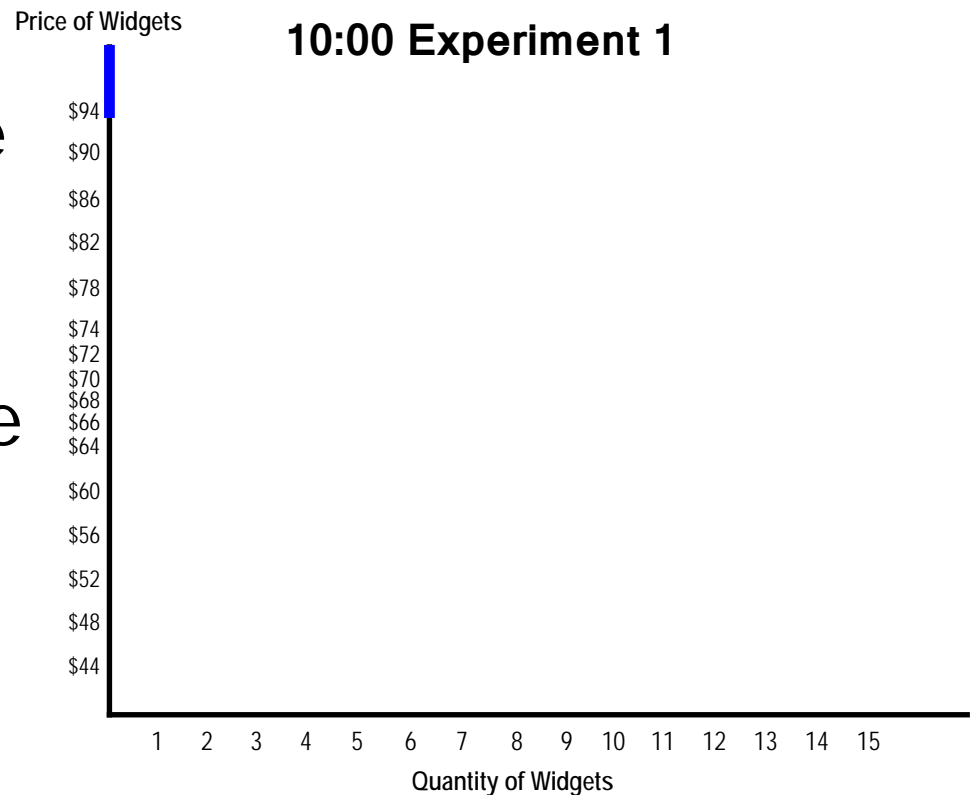
What was the demand curve?

- ◆ In 10:00 Experiment #1, the highest value for any buyer was \$94.



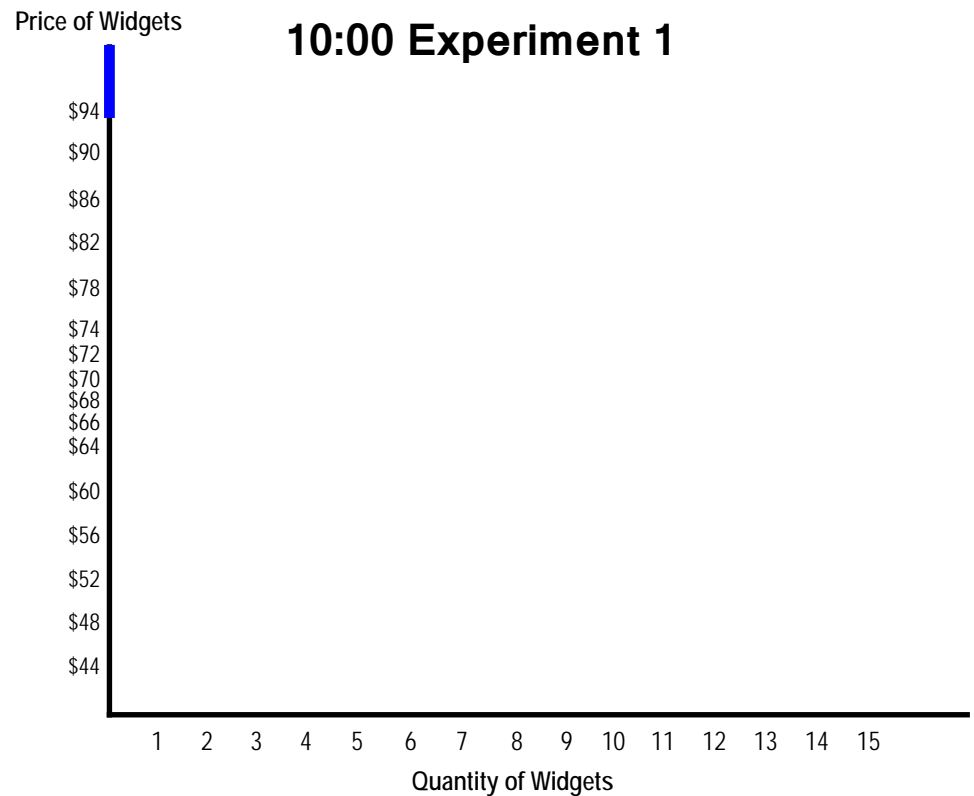
What was the demand curve?

- ◆ In 10:00 Experiment #1, the highest value for any buyer was \$94.
- ◆ For any price above \$94, quantity demanded was zero.



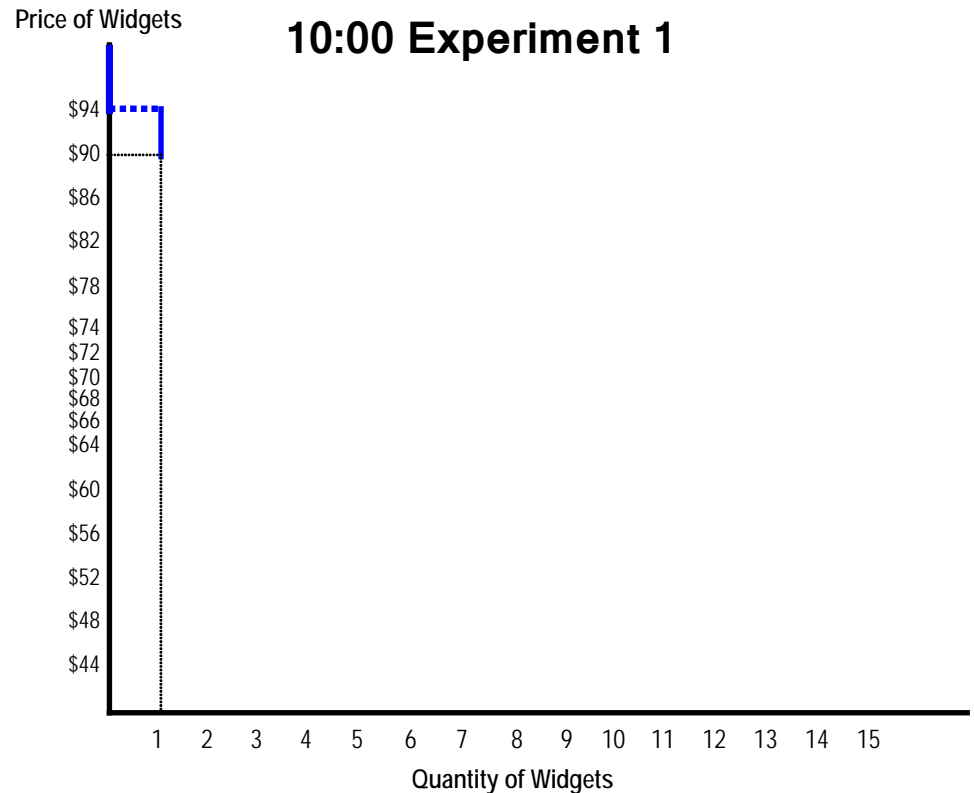
What was the demand curve?

- ◆ At a price of \$94, one person can buy without making losses.



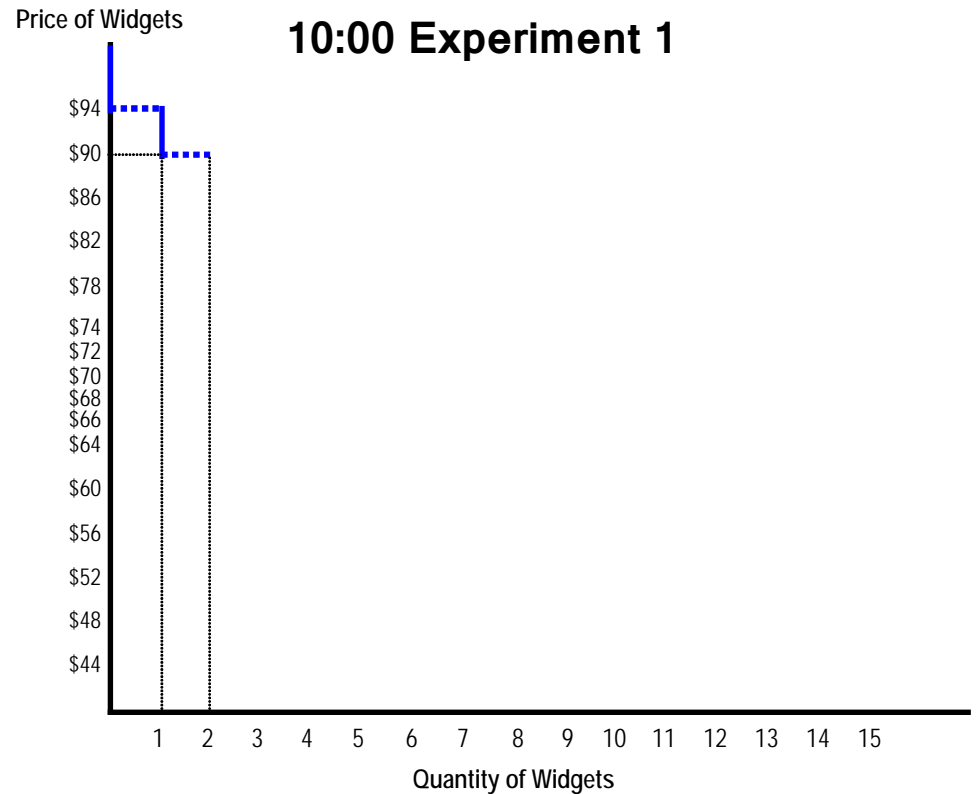
What was the demand curve?

- ◆ At a price of \$94, one person can buy without making a loss.
- ◆ For prices between \$94 and \$90, quantity demanded is one.



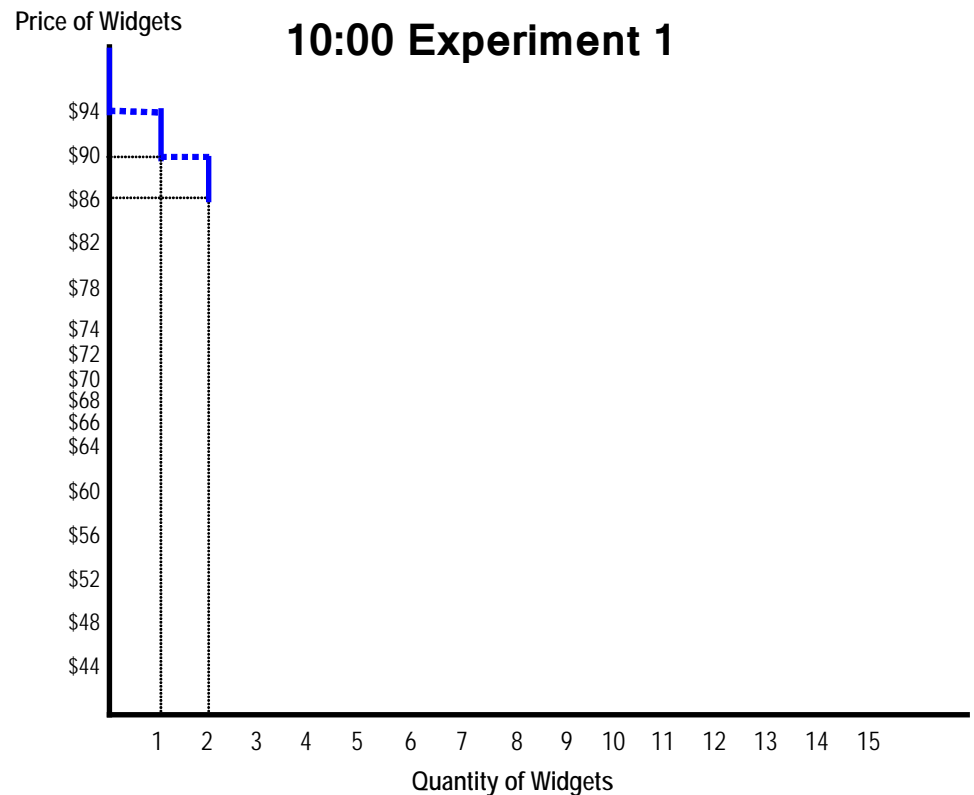
What was the demand curve?

- At price of \$90, one additional buyer would enter market.



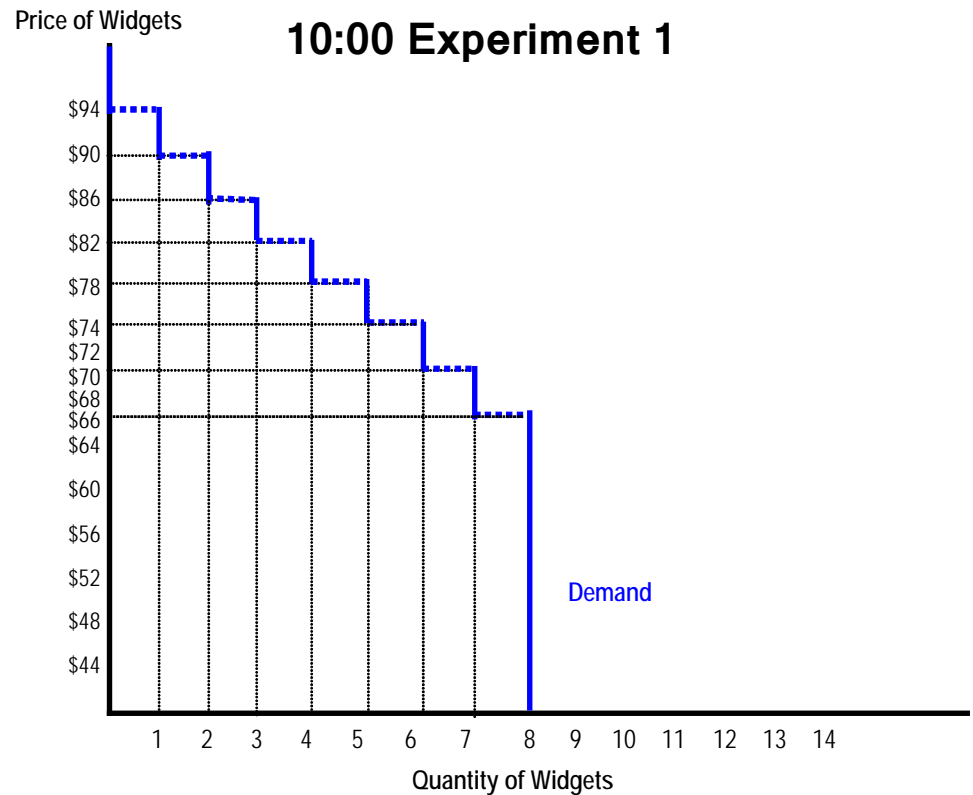
What was the demand curve?

- ◆ At price of \$90, one additional buyer would enter market.
- ◆ For prices between \$90 and \$86, quantity demanded is two.



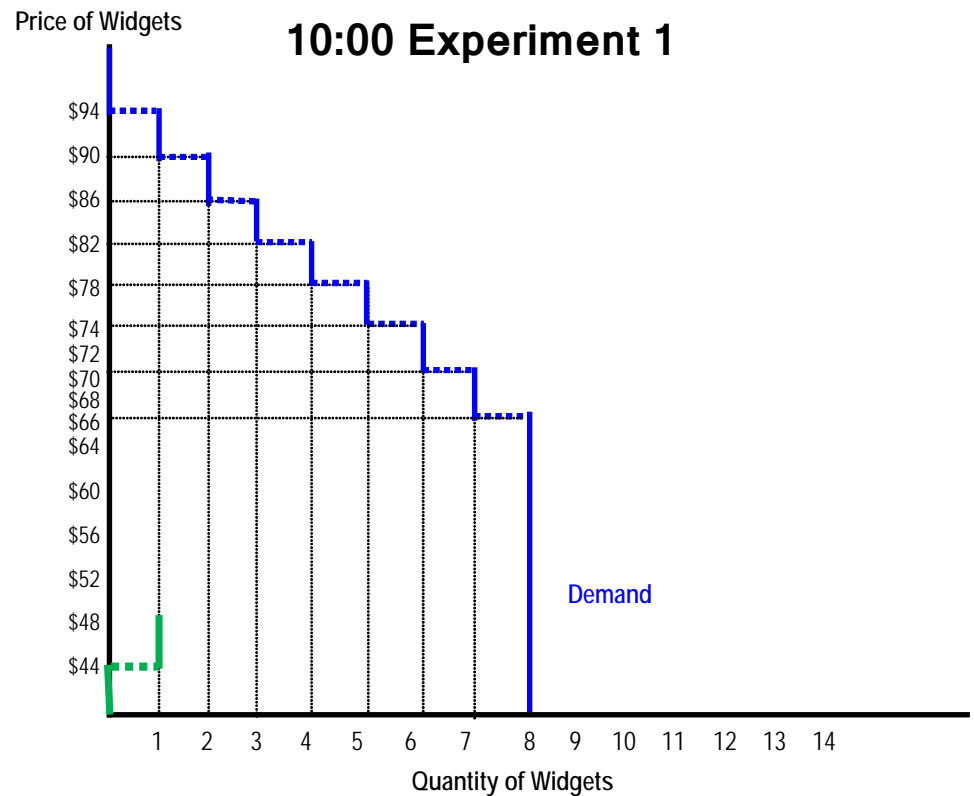
What was the demand curve?

- ◆ Continuing on, we construct the remainder of the demand curve.
- ◆ At prices below \$66, all 8 buyers are in the market and $Q^d = 8$.



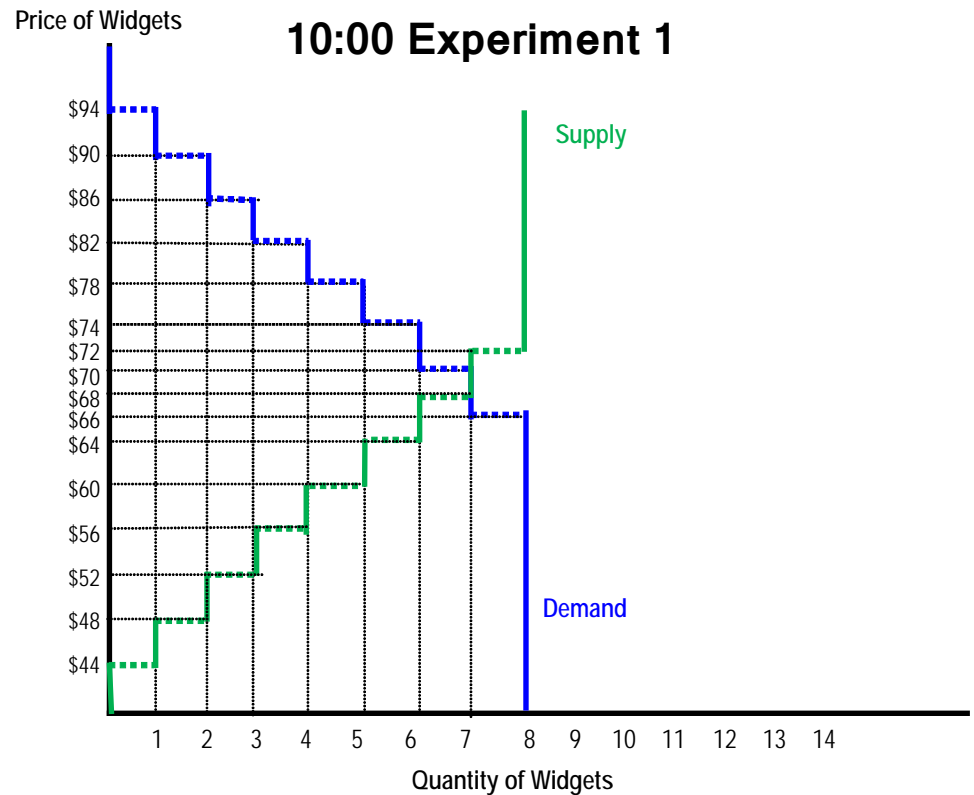
What was the supply curve?

By similar logic, quantity supplied jumps from zero to one at the lowest cost value: \$44.



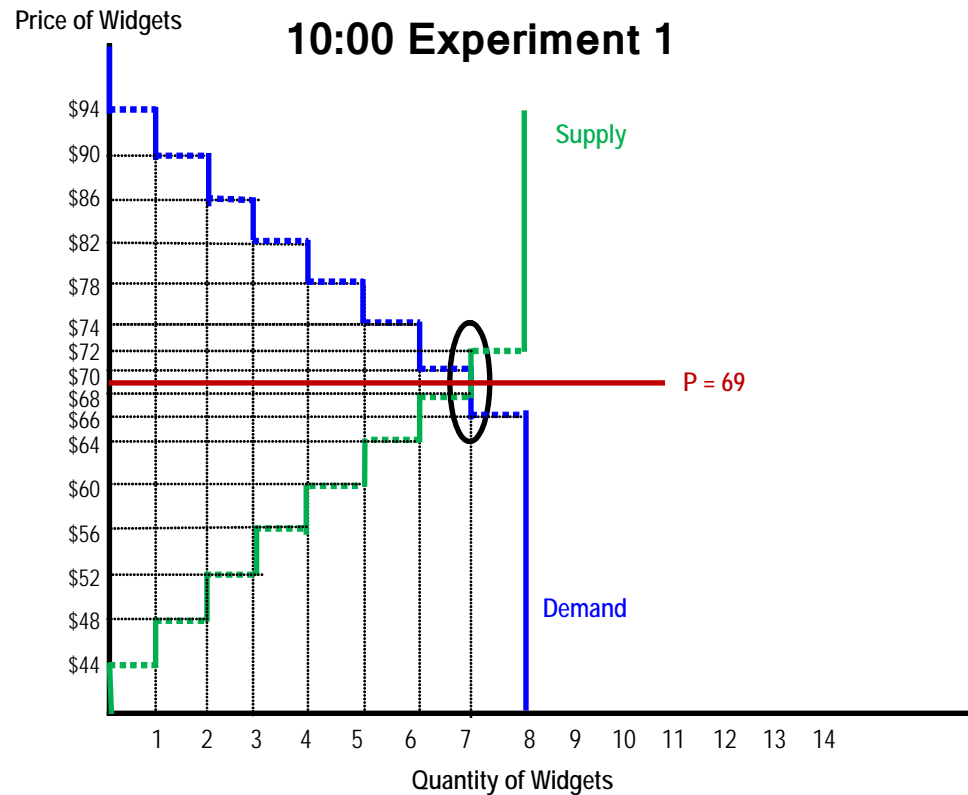
What was the supply curve?

- ◆ Continuing on, we add more sellers as the price rises and fill out the rest of the supply curve.
- ◆ At a price above \$72, all 8 sellers are in the market



Market Equilibrium

- ◆ At price between \$68 and \$70, exactly 7 buyers and sellers will trade.
- ◆ Equilibrium quantity is 7; price is ~\$69.





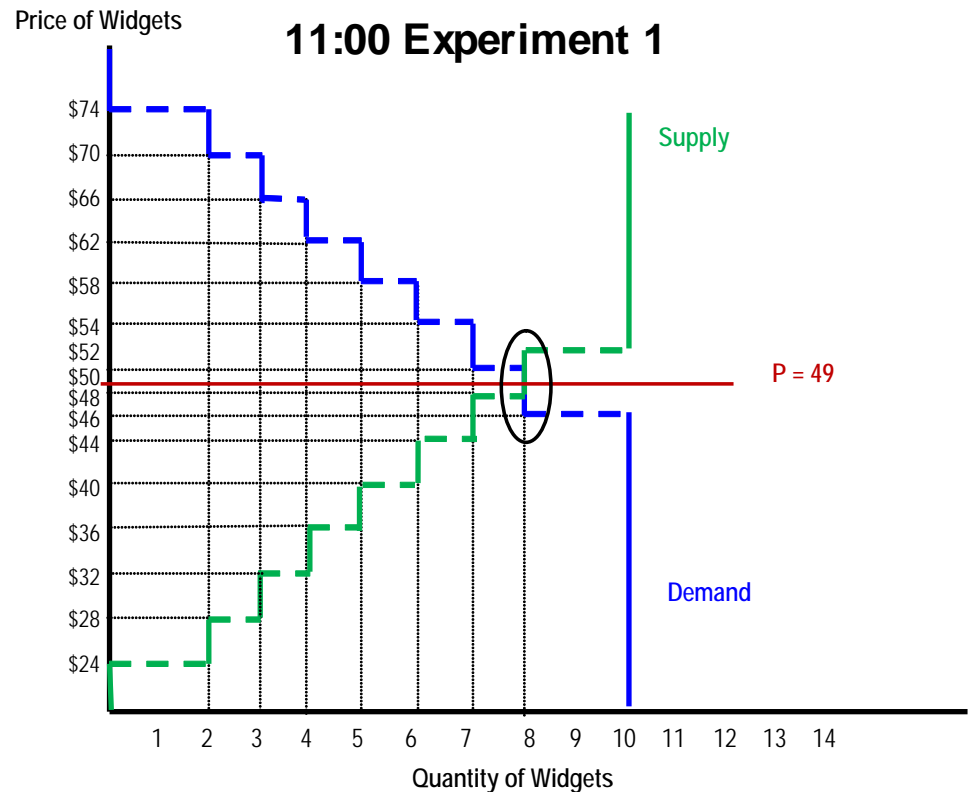
11:00 Experiment #1



- ◆ All dollar values were lower by \$20
- ◆ Ten buyers and sellers participated rather than eight
- ◆ All other aspects of Experiment #1 were identical

11:00 Experiment #1

- ◆ At price between \$48 and \$50, exactly 8 buyers and sellers will trade.
- ◆ Equilibrium quantity is 8; price is ~\$49.



Comparing actual and predicted outcomes

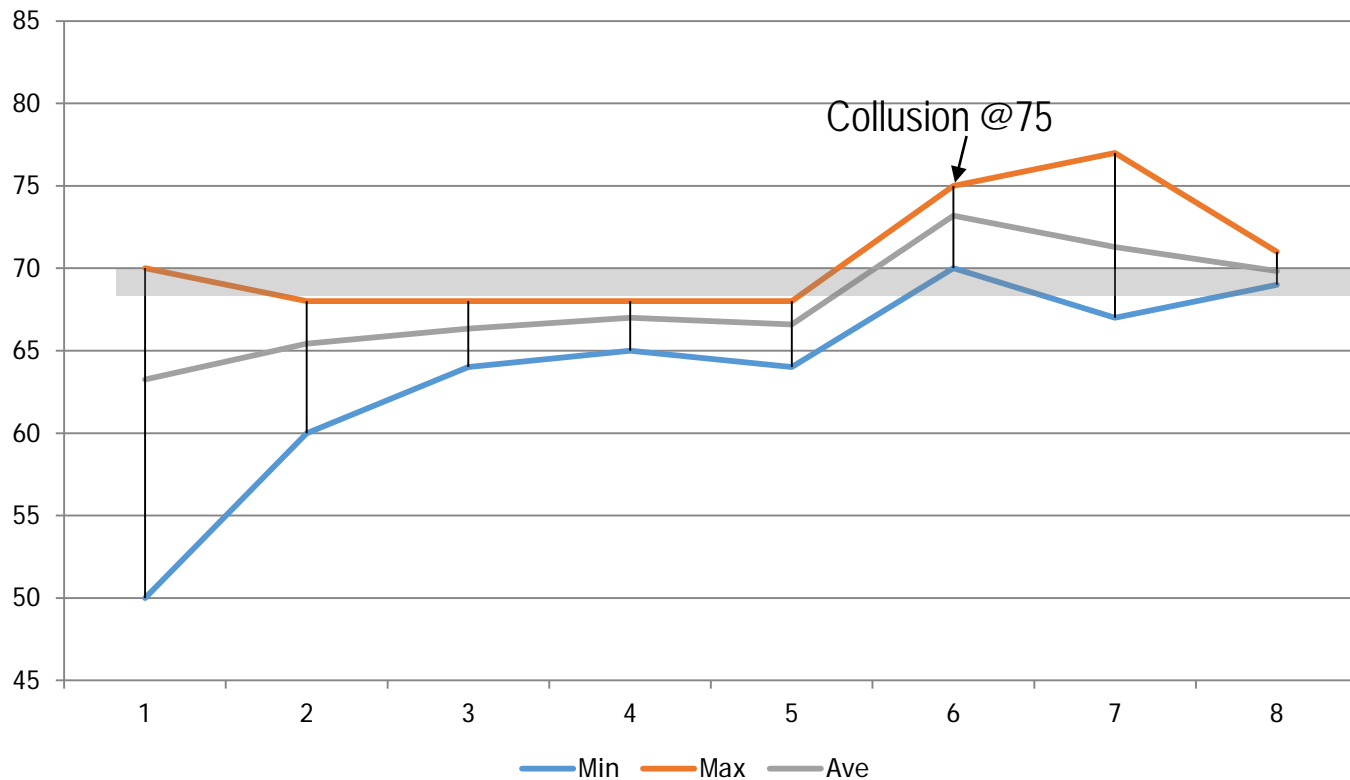
How close did your double-oral auctions come to replicating the predictions of the competitive-market model?

Quantity exchanged (10:00, Exp #1)

Period	Predicted Q	Actual Q	Notes
1	7	8	
2	7	7	
3	7	6	
4	7	7	
5	7	5	
6	7	5	Sellers collude @75
7	7	7	Carryover?
8	7	6	

Prices (10:00, Exp #1)

10:00 Experiment #1

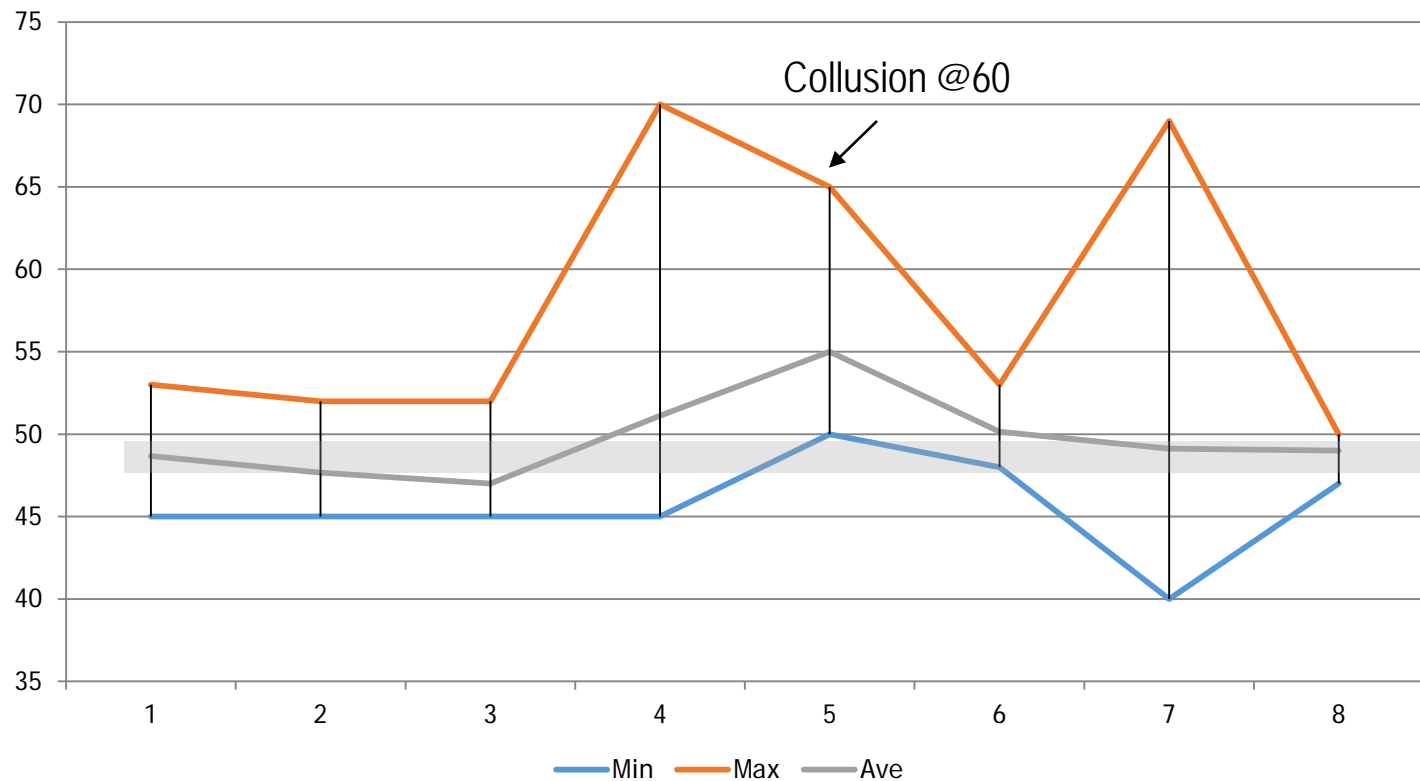


Quantity exchanged (11:00, Exp #1)

Period	Predicted Q	Actual Q	Notes
1	8	9	
2	8	9	
3	8	9	
4	8	8	
5	8	7	Sellers collude @60
6	8	7	
7	8	8	
8	8	7	

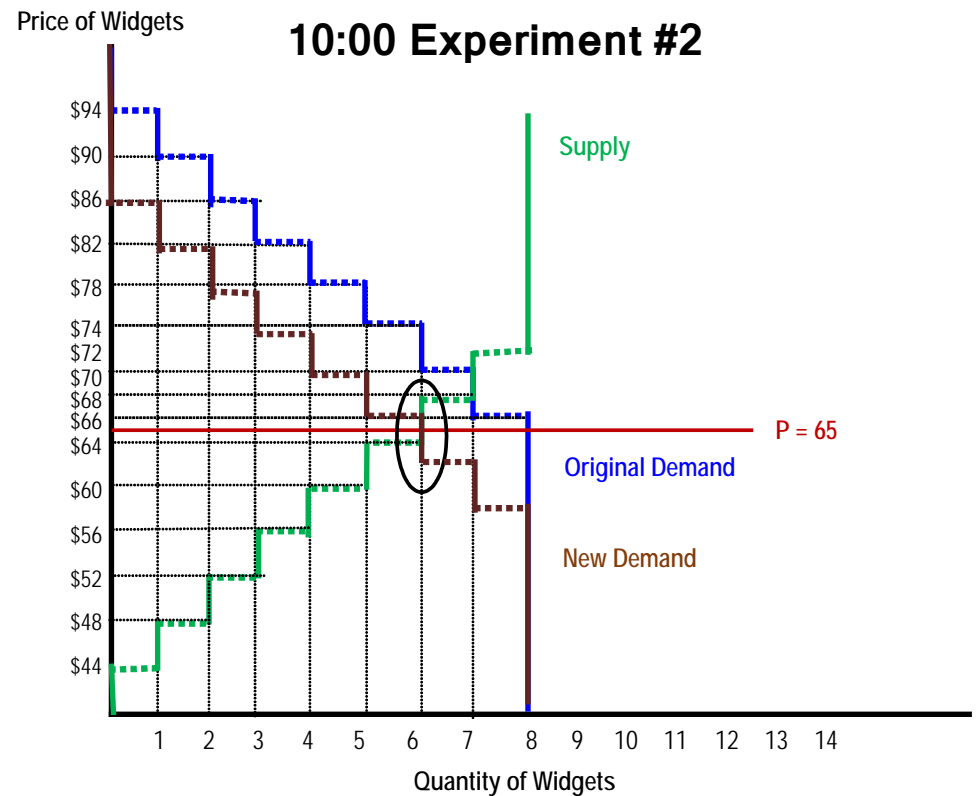
Prices (11:00, Exp #1)

11:00 Experiment #1



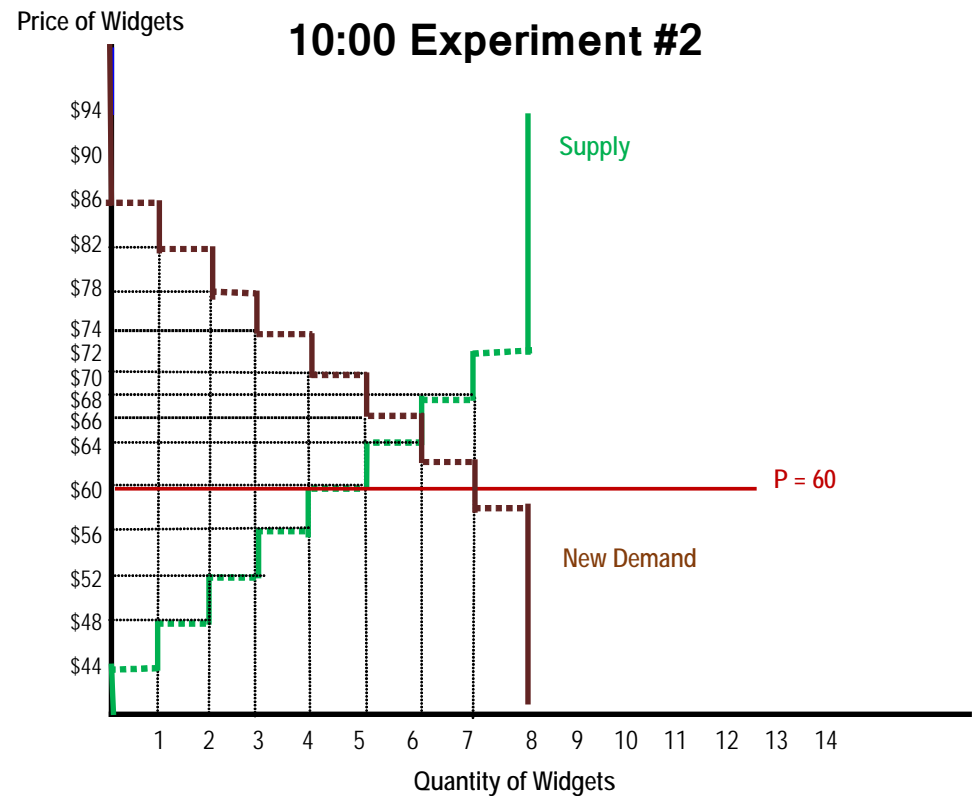
Experiment 2 (10:00)

- ◆ Exchanged values of adjacent buyers/sellers.
- ◆ Demand curve shifts down by \$8; supply unchanged.
- ◆ $P^* = \$65$, $Q^* = 6$.



Exp #2 (10:00): Price Ceiling

- ◆ Periods 6 & 7: price ceiling at \$60
- ◆ Only 4 sellers could gain (and 1 break even)
- ◆ Quantity demanded = 7
- ◆ Prediction: 4 or 5 trades at \$60

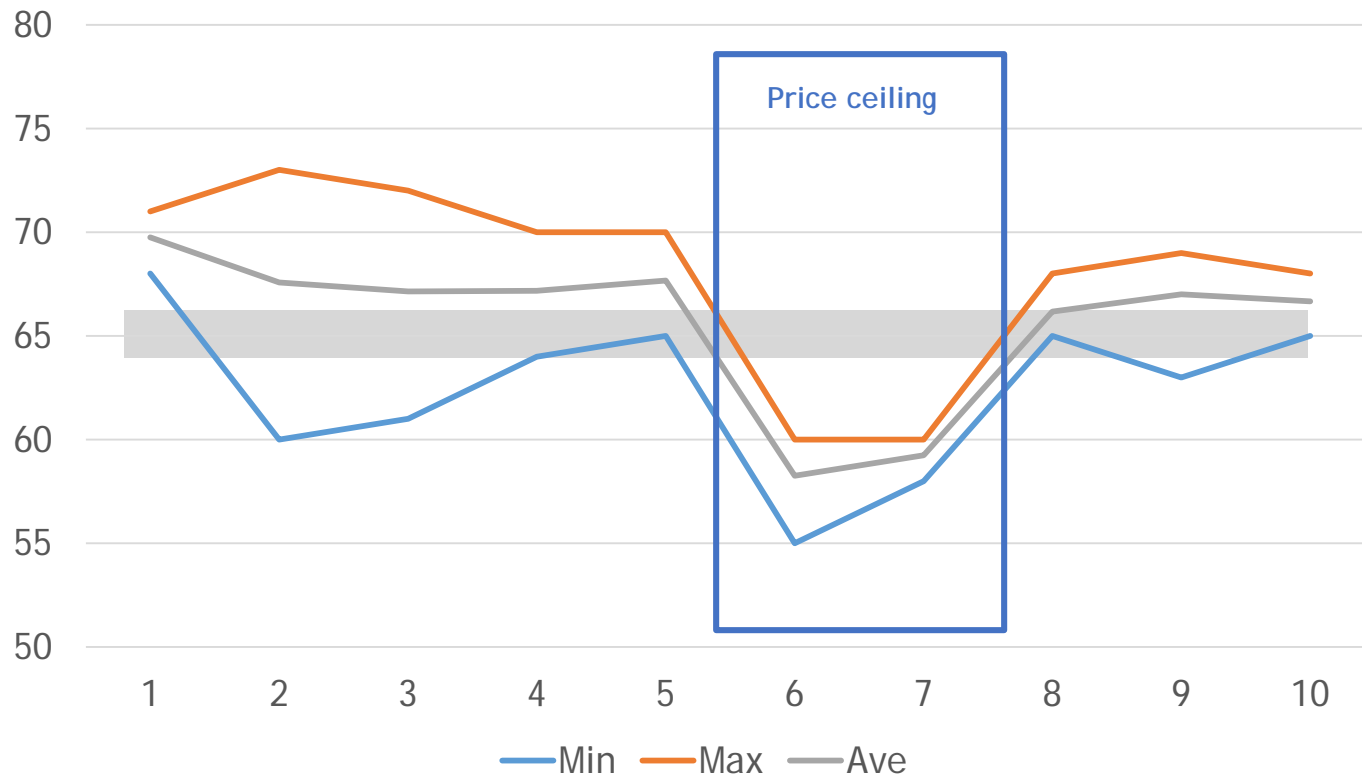


Quantity exchanged (10:00, Exp #2)

Period	Predicted Q	Actual Q	Notes
1	6	4	
2	6	7	
3	6	7	
4	6	6	
5	6	6	Sellers attempt collude
6	4 or 5	4	Price ceiling @ \$60
7	4 or 5	4	Price ceiling @ \$60
8	6	6	
9	6	6	
10	6	6	

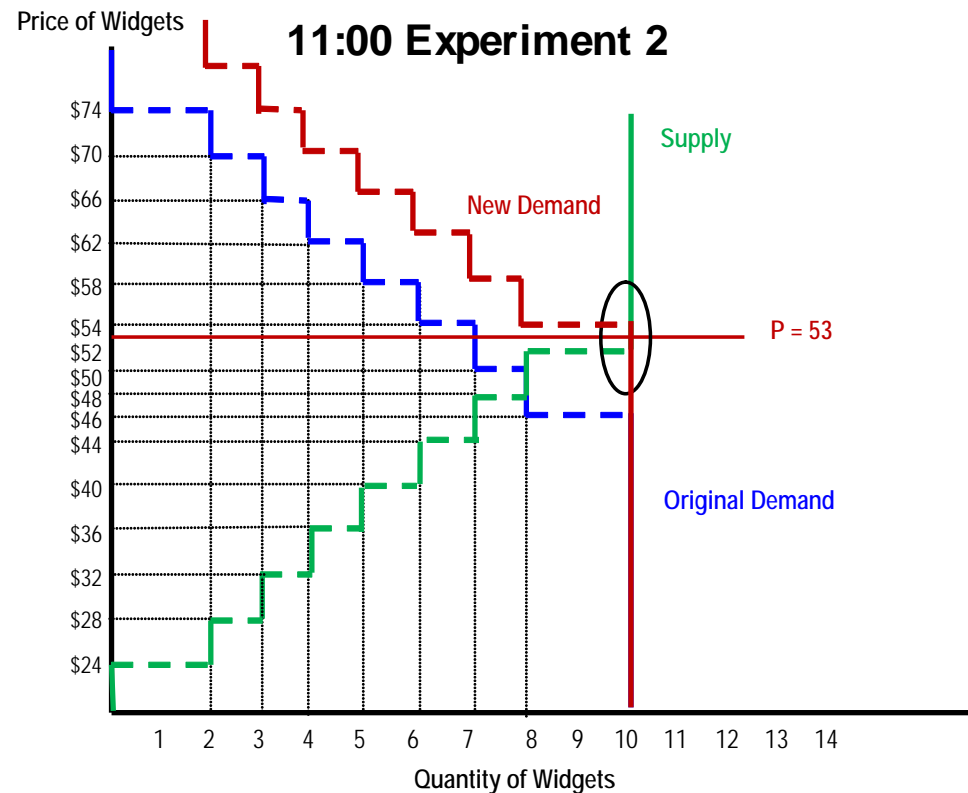
Price (10:00 Exp #2)

10:00 Exp #2



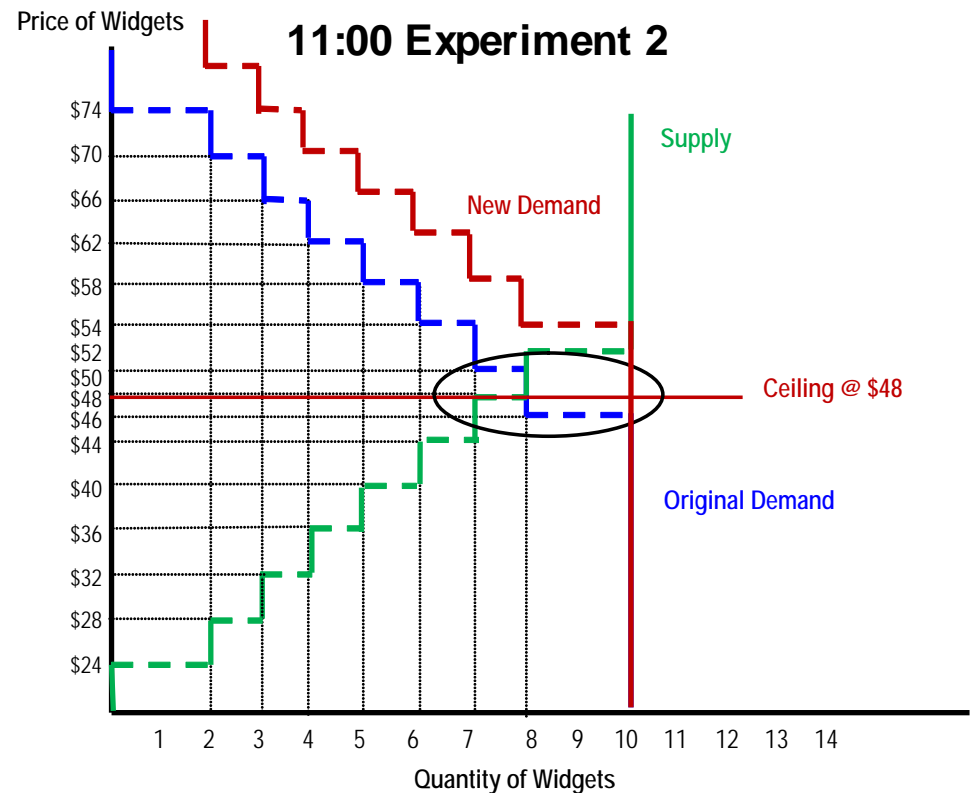
Experiment 2 (11:00)

- ◆ Exchanged values of adjacent buyers/sellers.
- ◆ Demand curve shifts up by \$8; supply unchanged.
- ◆ $P^* = \$53$, $Q^* = 10$.



Exp #2 (11:00): Price Ceiling

- ◆ Periods 4 & 5: price ceiling at \$48 (6 & 7 at 45)
- ◆ Only 7 sellers could gain (and 1 break even @48)
- ◆ Quantity demanded = 10
- ◆ Prediction: 7 or 8 trades at \$48 (or 7 at \$45)

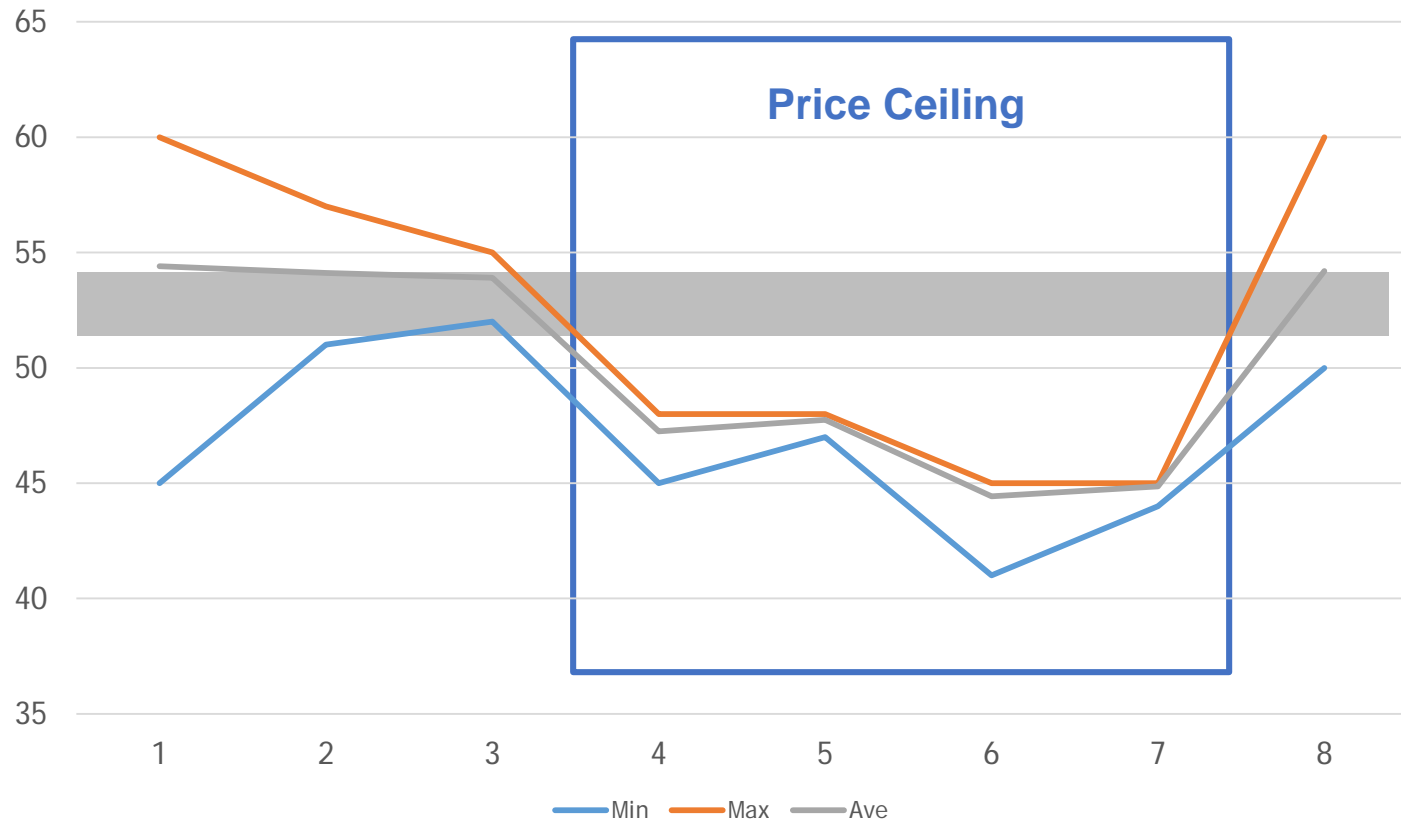


Quantity exchanged (11:00 Exp #2)

Period	Predicted Q	Actual Q	Notes
1	10	10	
2	10	9	
3	10	10	
4	7 or 8	8	Price ceiling @ \$48
5	7 or 8	8	Price ceiling @ \$48
6	7	7	Price ceiling @ \$45
7	7	7	Price ceiling @ \$45
8	10	10	

Price (11:00 Exp #2)

11:00 Exp #2

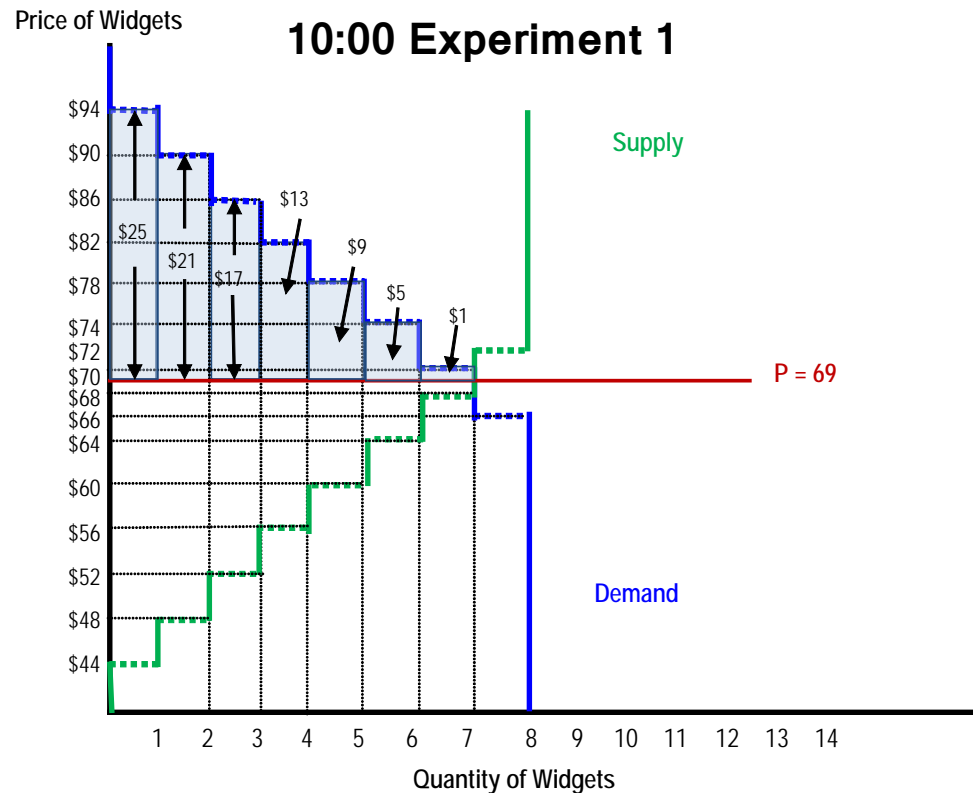


Gains from Exchange (Profits)

- ◆ Buyers' gain = Value minus price
- ◆ Sellers' gain = Price minus cost
- ◆ Summing over all buyers (sellers) gives "consumer (producer) surplus."

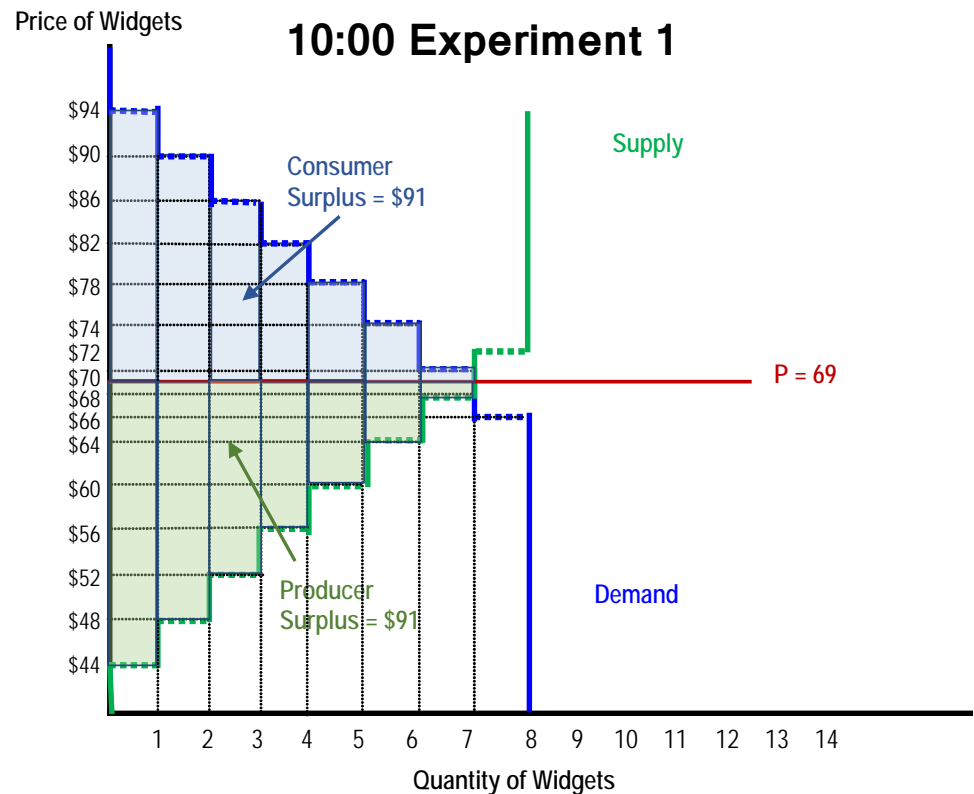
Consumer surplus in competitive equilibrium

- ◆ Sum gains for those buyers in market
- ◆ No surplus for buyers not trading
- ◆ Equals area under demand curve above price line



Producer surplus in equilibrium

- ◆ Repeat surplus calculation for sellers
- ◆ Producer surplus equals area above supply curve below price line
- ◆ $CS = PS$ in this case because of symmetry
- ◆ Total potential gains in CE = \$182

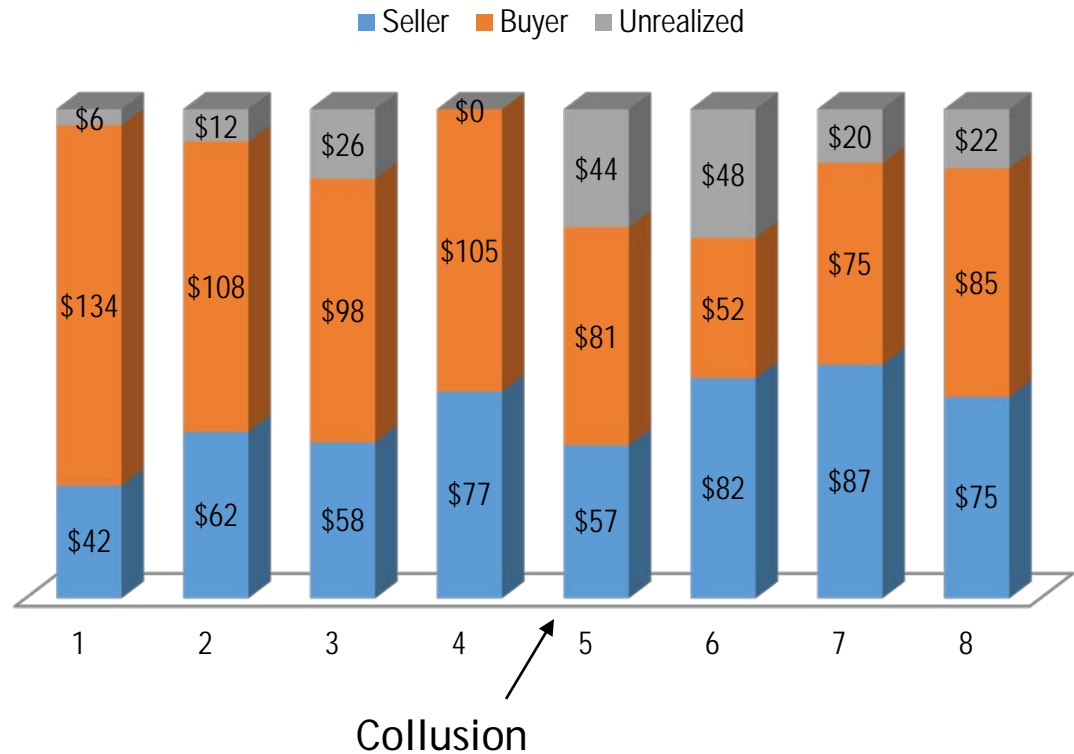


Surplus in other experiments

- ◆ 10:00 Experiment #2
 - $CS = PS = \$66$, Total gains = \$132
- ◆ 11:00 Experiment #1
 - $CS = PS = \$116$, Total gains = \$232
- ◆ 11:00 Experiment #2
 - $CS = PS = \$150$, Total gains = \$300

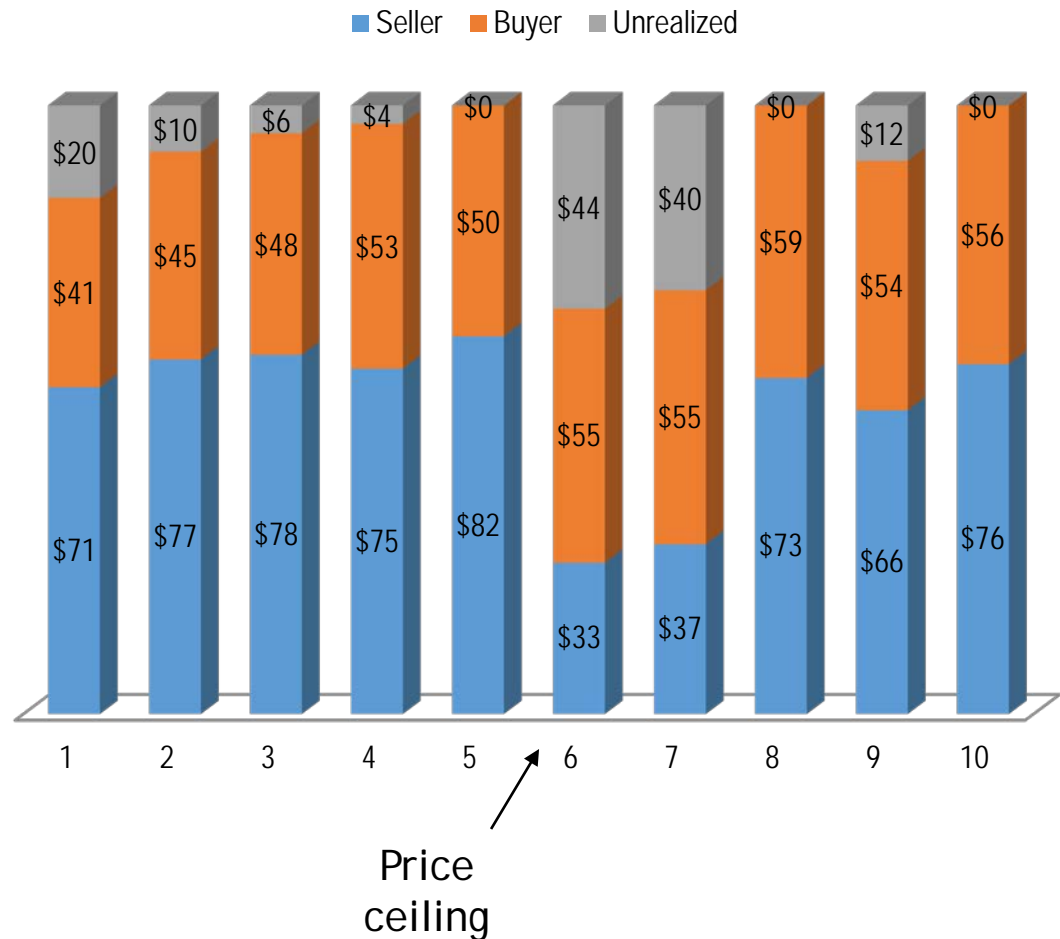
Experiment 1 (10:00): Gains from exchange

Expected gains = \$91 each for buyers and sellers; \$182 total.



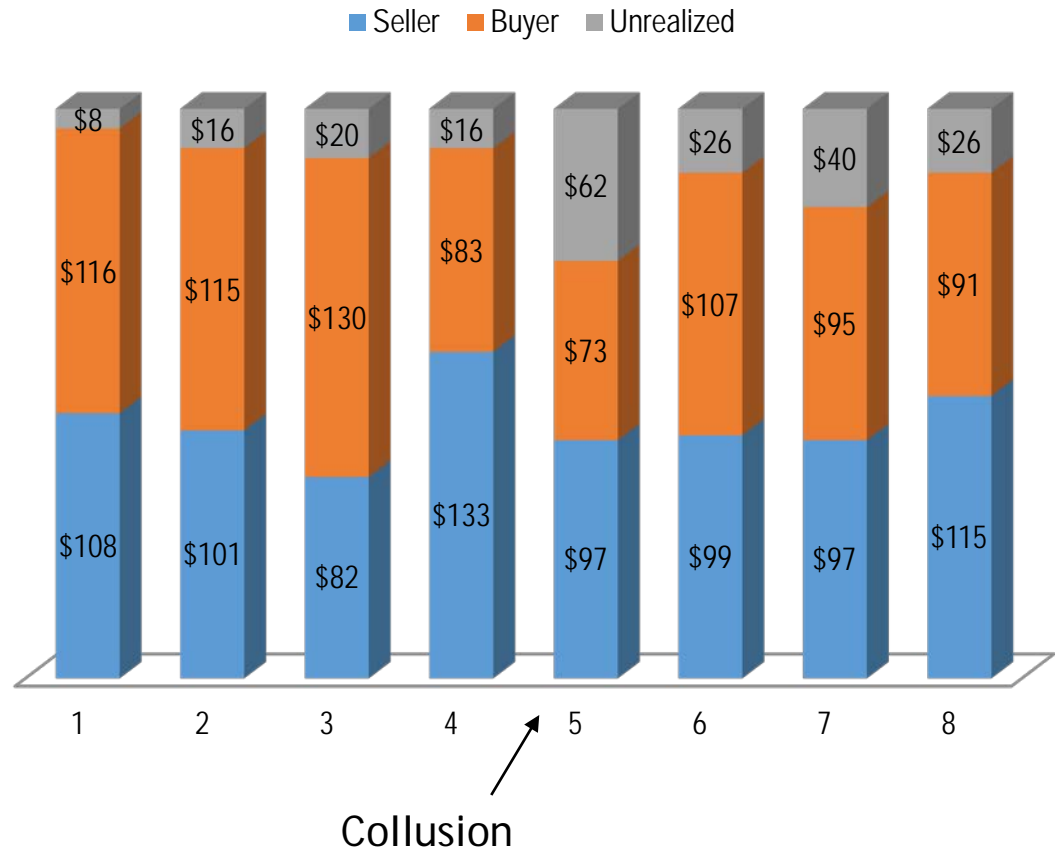
Experiment 2 (10:00): Gains from exchange

Expected gains = \$66 each for buyers and sellers; \$132 total.



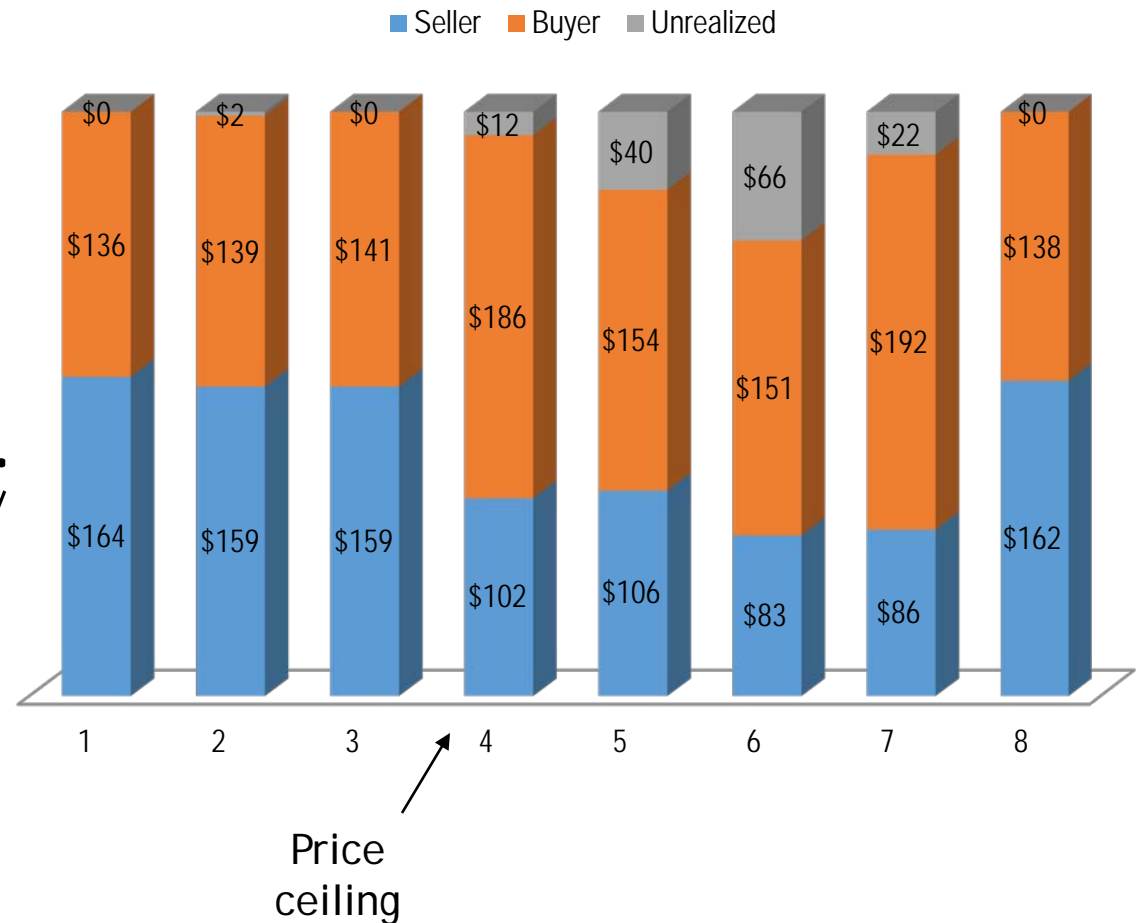
Experiment 1 (11:00): Gains from exchange

Expected gains =
\$116 each
for buyers
and sellers;
\$232 total.



Experiment 2 (11:00): Gains from exchange

Expected gains =
\$150 each
for buyers
and sellers;
\$300 total.



Lessons from Double-Oral Auction Experiment

- ◆ Order from chaos: an apparently disorganized market converged (more or less) toward equilibrium.
- ◆ Most available gains from exchange were realized, except when collusion or price control interfered.
- ◆ There are always anomalies in classroom markets ... and in real ones.
- ◆ Others????