

APPENDIX

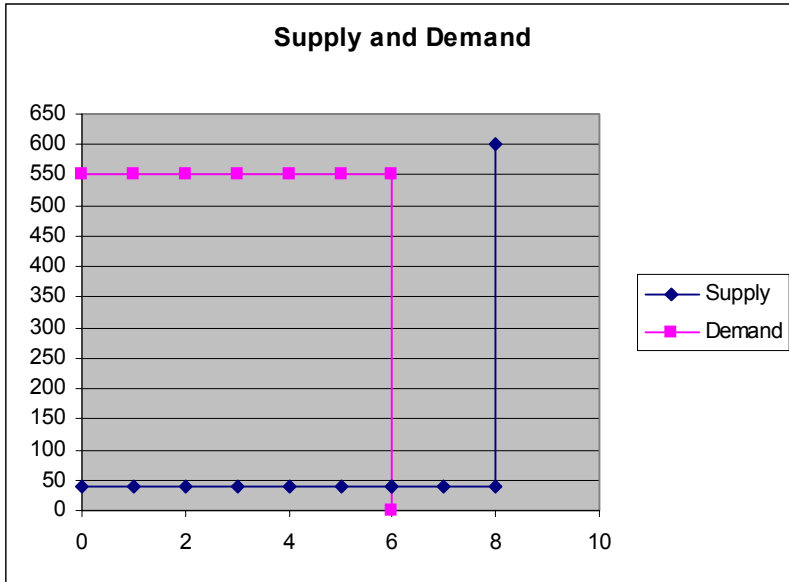
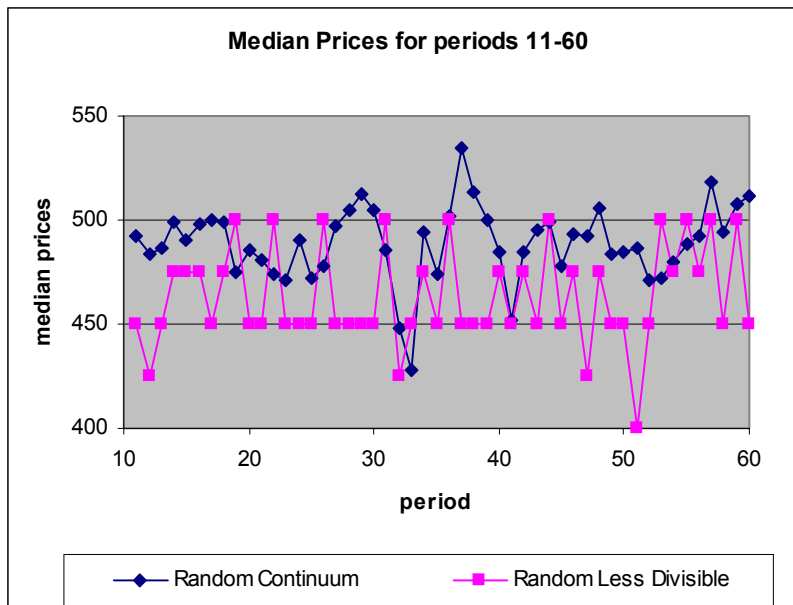
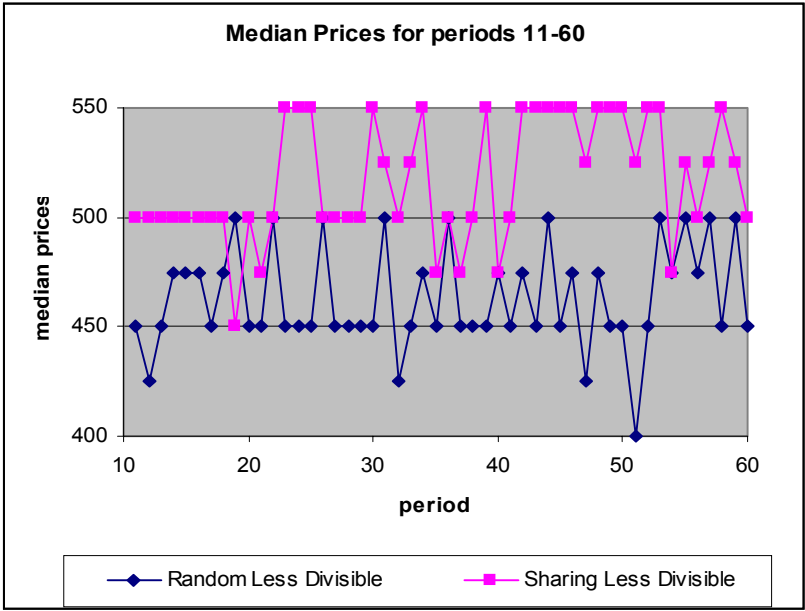


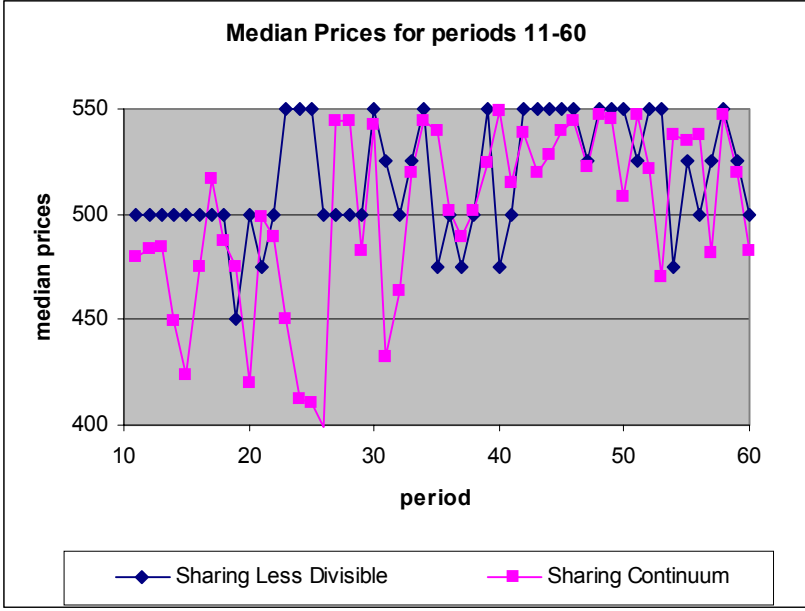
Figure 2. Induced supply and demand arrays.



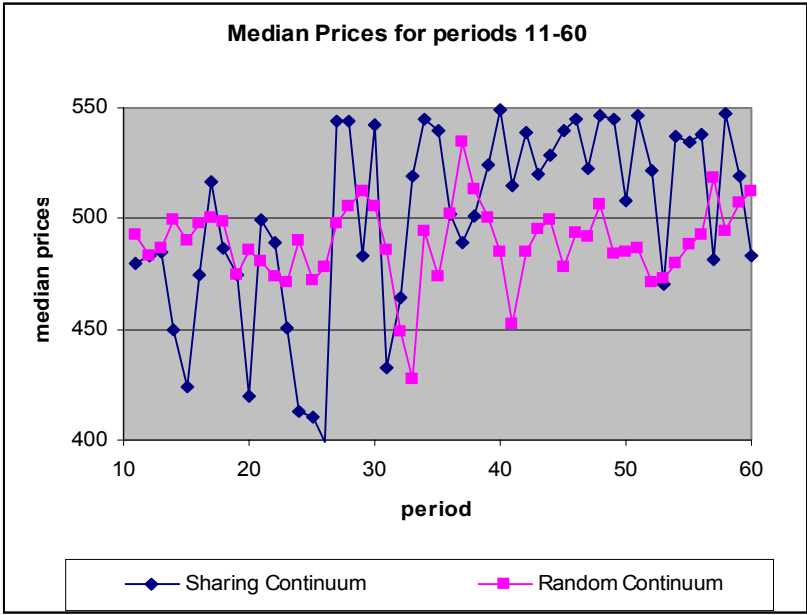
3a) Random Continuum vs. Random Less Divisible



3b) Random Less Divisible vs. Sharing Less Divisible

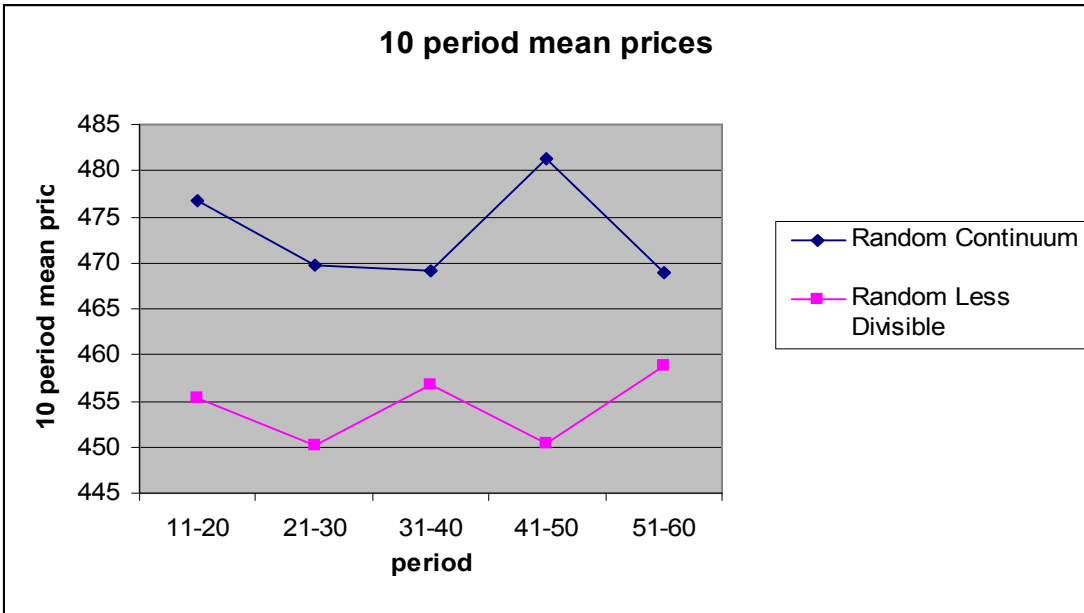


3c) Sharing Less Divisible vs. Sharing Continuum

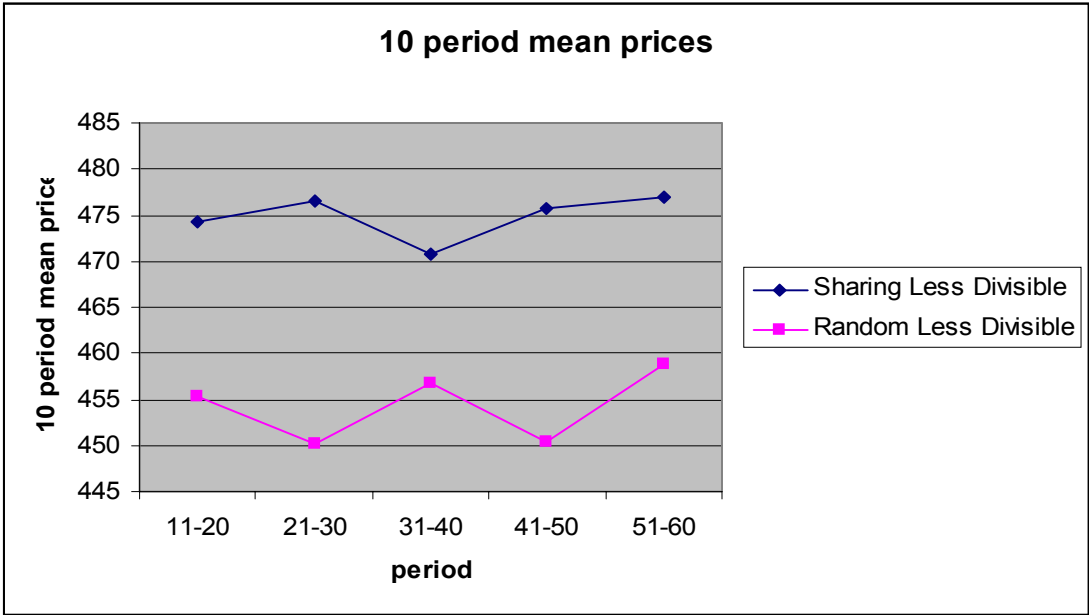


3d) Sharing Continuum vs. Random Continuum

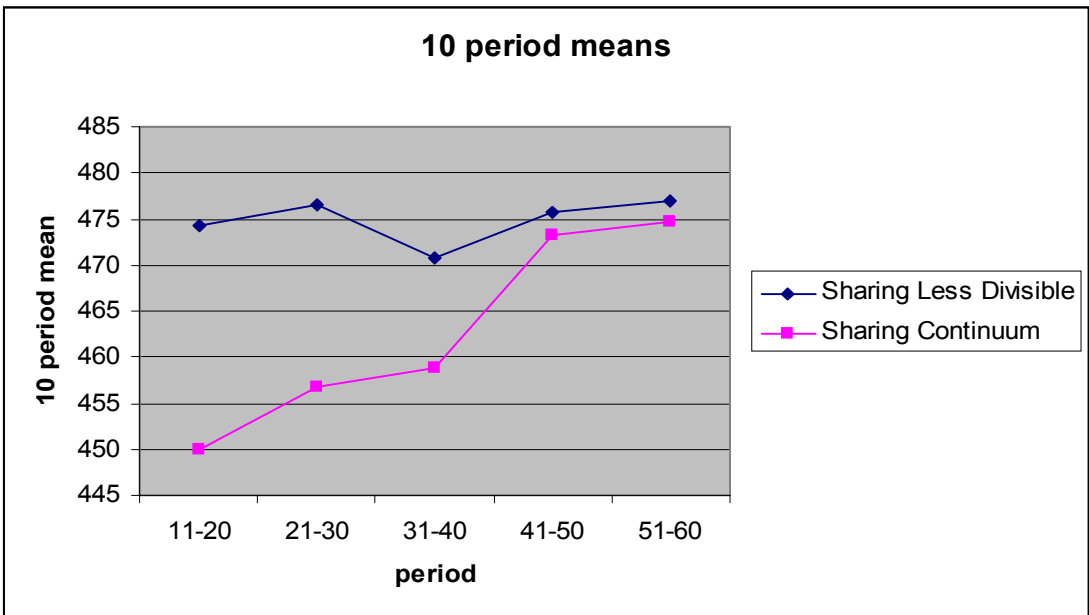
Figure 3. Median Prices for periods 11-60 pooled by treatment.



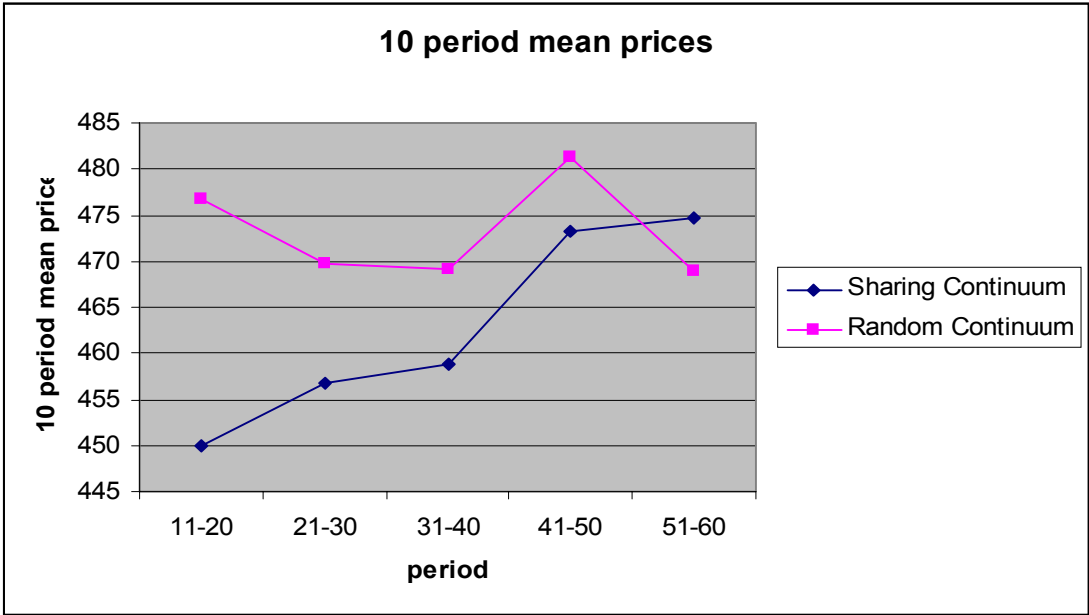
4a) Random Continuum vs. Random Less Divisible



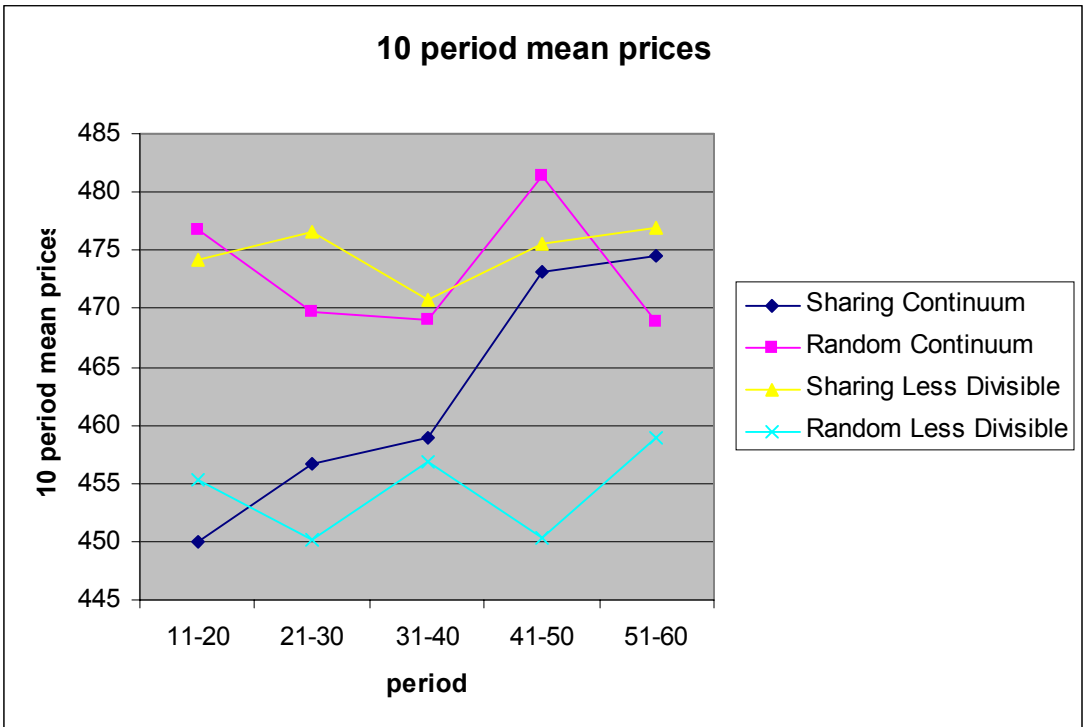
4b) Sharing Less Divisible vs. Random Less Divisible



4c) Sharing Less Divisible vs. Sharing Continuum



4d) Sharing Continuum vs. Random Continuum



4e) All treatments

Figure 4. Ten period mean prices pooled by treatments.

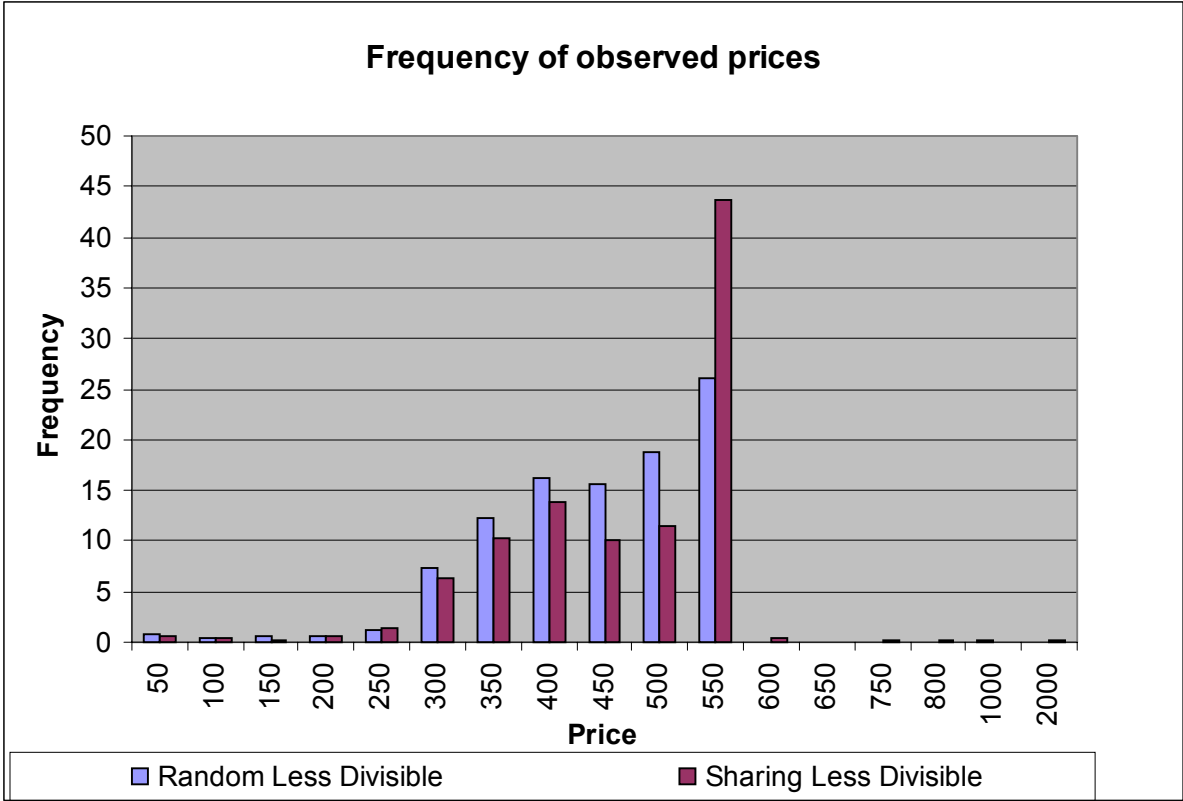


Figure 5. Frequency of observed prices under Random Less Divisible and Sharing Less Divisible.

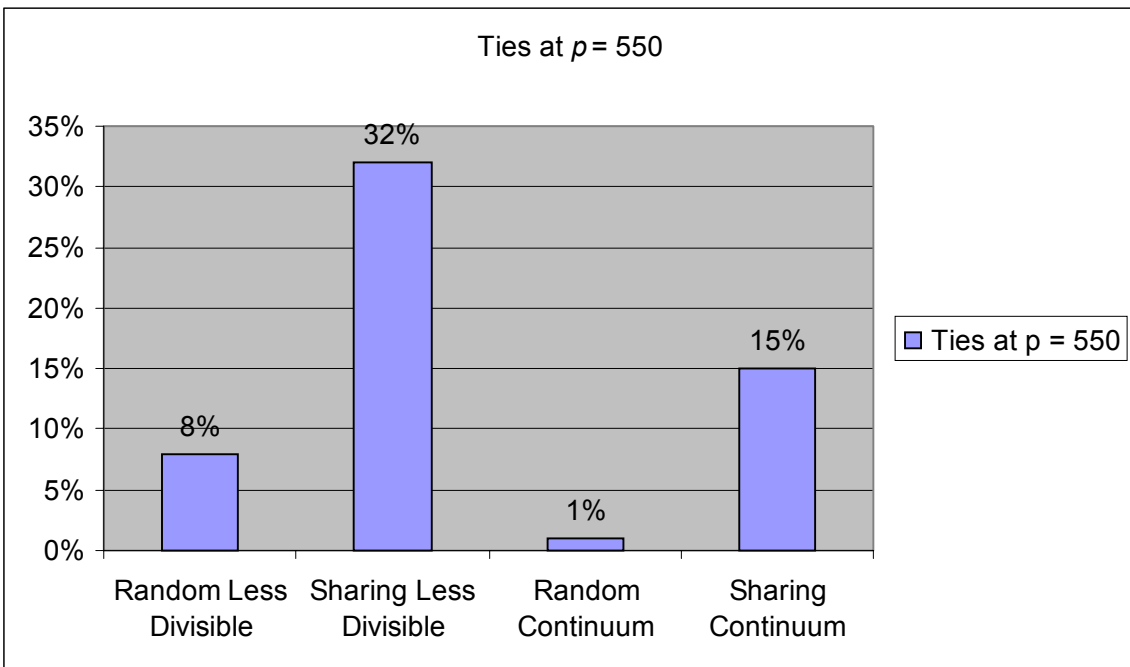


Figure 6. Percentages of ties at $p = 550$ pooled by treatments.

Instructions

General

This is an experiment in the economics of market decision making. The instructions are simple and if you follow them carefully and make good decisions you will earn money that will be paid to you privately in cash. All earnings in your computer screens are in Experimental Dollars. These Experimental Dollars will be converted to real Dollars at the end of the experiment, at a rate of _____ Experimental Dollars = 1 real Dollar.

We are going to conduct a set of markets in which you will be a participant in a sequence of 60 trading periods where you can sell units of a good X. There are *two* sellers in every market. You will be a seller in today's experiment, and you will remain in this role throughout the experiment. During each trading period you will be free to sell units of the good X as you choose. Sellers earn money from selling units that cost a known amount.

Attached to these instructions you will find a sheet labeled Personal Record Sheet, which will also help you keep track of your earnings based on the decisions you might make. You are not to reveal this information to anyone. It is your own private information.

PERIODS 1-60

Buyers

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There is a single buyer. The buyer will make purchases according to the following rules.

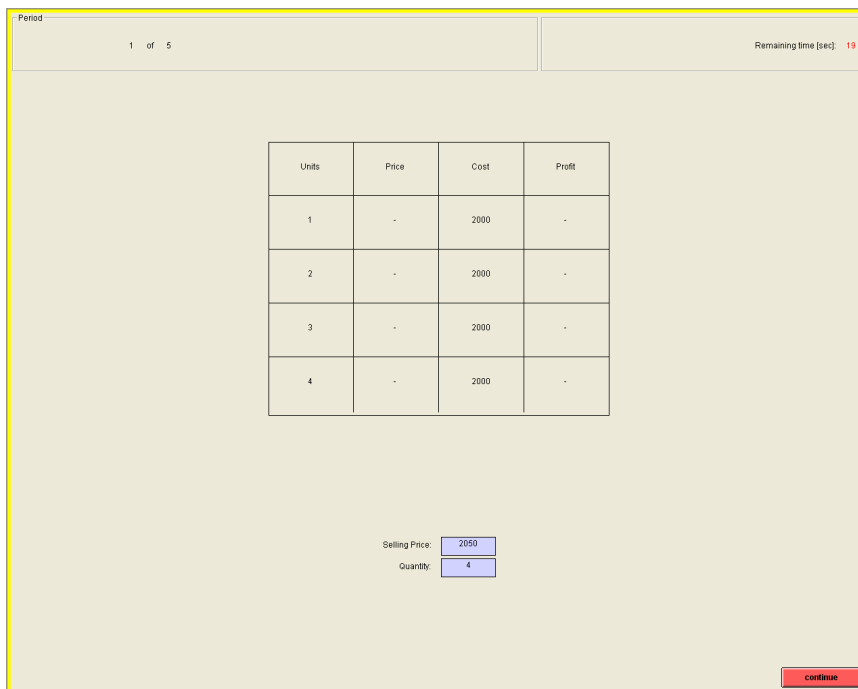
- 1) The buyer will purchase a total of 6 units, if 6 units are available at prices of \$550 or below. The buyer will purchase no units priced above \$550.

- 2) The buyer will purchase first from the seller posting the lowest price, then from the seller posting the second lowest price. Once a seller has been selected, the buyer will purchase all units that can be afforded from that seller. If the buyer finishes making purchases from one seller and still wishes to buy more units, then the buyer will switch to the other seller.

- 3) If two sellers post identical prices and the total number of units offered exceeds 6 units, then the buyer will buy the same number of units from both sellers. For example, if each seller offers 4 units at the same price, then the buyer will purchase an equal amount from each seller.

Sellers

In this experiment there are *two* sellers in every market who are paired throughout the 60 periods. If you are a seller, your computer screen displays your costs —one cost value for each unit you might sell. The sellers are *identical*. That is, sellers incur the *same* per-unit cost when they sell a unit. Sellers may sell at most four units. See Figure 1 (the costs of the units you might sell on this example screen are completely different from the actual costs used in the experiment).



Period: 1 of 5 Remaining time (sec): 19

Units	Price	Cost	Profit
1	-	2000	-
2	-	2000	-
3	-	2000	-
4	-	2000	-

Selling Price:
Quantity:

Figure 1: Example Market Trading Screen for Sellers

The profits from sales in each period (which are yours to keep) are computed by taking the difference between the amount of revenue you receive from the buyer minus the necessary production costs.

The revenue you receive from the buyer equals, of course, the price you charge times the quantity you actually sell. The buyer chooses how much to buy from you, up to the maximum quantity you have chosen to offer to the market. Your production cost is based on the units purchased from you.

That is,

[your earnings = (selling price × number of units sold) – (production cost of units sold)].

Suppose, for example, that the cost for your first unit is 2000, and the cost of your second unit is 2000. If you sell one unit at a price of 2050 your earnings are:

$$\text{Earnings} = (2050 \times 1) - (2000) = 50.$$

If you sell two units at a price of 2050 your earnings are:

$$\text{Earnings} = (2050 \times 2) - (2000+2000) = 100.$$

Your earnings per period and from all periods will be updated at the end of every period at the bottom of your computer screen, and are labeled *Profit this period* and *Total profit from all periods*, respectively. At the end of every period your computer screen will also display *Your price*, the *Other seller's price*, the *Number of units you sold*, and the *Total quantity sold in the market*. (See Figure 2.)

Units	Price	Cost	Profit
1	2050	2000	50
2	2050	2000	50
3	2050	2000	50
4	0	2000	0

Your price: 2050
 Other seller's price: 2050
 Number of units you sold: 3
 Total quantity sold in the market: 6
 Profit this period: 150
 Total profit from all periods: 350

Figure 2: Example Market Trading Screen for Sellers

Notice that if a unit costs more than the amount for which you sell it then you suffer a loss in earnings on that unit. If you do not sell any units in a period then your earnings are

zero for that period. Importantly, you do not incur the cost of a unit unless you sell that unit.

How to Sell

In each period you post a SELLING PRICE. Note that both you *and* the seller you are paired with must post a selling price which is a multiple of 50. You also select a QUANTITY. This limit represents the maximum number of units that you are willing to sell AT THE SELLING PRICE. You may offer as many units as you have available. However, if the posted price does not exceed the cost of all offered units, you lose earnings. You will enter selling prices and quantity using your computer. Figure 1 shows the market trading screen as seen by sellers. You submit selling prices and quantity limits using the “Selling Price” and “Quantity” box in the lower center of the screen, and then clicking on the “Continue” button. Once the selling price and the quantity are submitted, they are binding in the sense that the buyer can buy some or all of the units offered. This results in an immediate trade at the posted price.

The selling prices and the quantities of all the sellers are then given to the buyer, and the buyer may then purchase as much as he wishes from those goods that have been made available to him. A period ends when the buyer finishes making purchases, or when all sellers are out of units.

Recording Rules for Sellers

Your earnings per period and from all periods will be updated at the end of every period at the bottom of your computer screen, and are labeled *Profit this period* and *Total profit from all periods*, respectively. At the end of every period your computer screen will also display *Your price*, the *Other seller's price*, the *Number of units you sold*, and the *Total quantity sold in the market*. Your Personal Record Sheet contains 7 columns. At the end of a trading period you should write down the price you posted in column (2), the other seller's price in column (3), the units you sold in column (4), the number of units sold in the market in column (5), the per period profit in (6), and the total profit from all periods in (7). At the end of the experiment you will divide your total profit from all periods by the conversion rate to determine your total earnings in real Dollars.

Summary

- Sellers post selling prices and quantities. In making a price/quantity posting, the seller indicates a willingness to sell the posted number of units at the selling price
- There is one buyer who is played by the computer
- The buyer will purchase a total of 6 units, if 6 units are available at prices of \$550 or below. The buyer will purchase no units priced above \$550
- In the event that the two sellers post the same price and the total number of units offered exceeds 6 units, the buyer will buy the same number of units from both sellers
- Seller earnings = (selling price \times number of units sold) – (production cost of units sold)
- A period ends when the buyer finishes to make his purchases, or when all sellers are out of units
- At the end of the period your computer screen displays:
 - (1) Your price
 - (2) The price posted by the other seller
 - (3) Number of units you sold
 - (4) Total quantity sold in the market
 - (5) Your profit this period
 - (6) Your profit from all periods
- Sellers should record these on Record Sheets at the end of each period

Are there any questions now before we begin the experiment?

Personal Record Sheet for Subject _____

Period	Your Price	Other Seller's Price	Units you sold	Units sold in the market	Period Profit	Total Profit from all periods
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1						
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Period	Your Price	Other Seller's Price	Units you sold	Units sold in the market	Period Profit	Total Profit from all periods
(1)	(2)	(3)	(4)	(5)	(6)	(7)
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				Divide by	Conversion Rate	
					Converted Total	

Instructions

General

This is an experiment in the economics of market decision making. The instructions are simple and if you follow them carefully and make good decisions you will earn money that will be paid to you privately in cash. All earnings in your computer screens are in Experimental Dollars. These Experimental Dollars will be converted to real Dollars at the end of the experiment, at a rate of _____ Experimental Dollars = 1 real Dollar.

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PERIODS 1-60

Buyers

The buyers' side of the market in today's experiment is simulated by a computer.

There is a single buyer. The buyer will make purchases according to the following rules.

- 4) The buyer will purchase a total of 6 units, if 6 units are available at prices of \$550 or below. The buyer will purchase no units priced above \$550.

- 5) The buyer will purchase first from the seller posting the lowest price, then from the seller posting the second lowest price. Once a seller has been selected, the buyer will purchase all units that can be afforded from that seller. If the buyer finishes making purchases from one seller and still wishes to buy more units, then the buyer will switch to the other seller.

- 6) If two sellers post identical prices, then the buyer will randomly choose which seller to approach first.

Sellers

In this experiment there are *two* sellers in every market who are paired throughout the 60 periods. If you are a seller, your computer screen displays your costs —one cost value for each unit you might sell. The sellers are *identical*. That is, sellers incur the *same* per-unit cost when they sell a unit. Sellers may sell at most four units. See Figure 1 (the costs of the units you might sell on this example screen are completely different from the actual costs used in the experiment).

Period: 1 of 5 Remaining time (sec): 19

Units	Price	Cost	Profit
1	.	2000	.
2	.	2000	.
3	.	2000	.
4	.	2000	.

Selling Price:
Quantity:

Figure 1: Example Market Trading Screen for Sellers

The profits from sales in each period (which are yours to keep) are computed by taking the difference between the amount of revenue you receive from the buyer minus the necessary production costs.

The revenue you receive from the buyer equals, of course, the price you charge times the quantity you actually sell. The buyer chooses how much to buy from you, up to the maximum quantity you have chosen to offer to the market. Your production cost is based on the units purchased from you.

That is,

[your earnings = (selling price × number of units sold) – (production cost of units sold)].

Suppose, for example, that the cost for your first unit is 2000, and the cost of your second unit is 2000. If you sell one unit at a price of 2050 your earnings are:

$$\text{Earnings} = (2050 \times 1) - (2000) = 50.$$

If you sell two units at a price of 2050 your earnings are:

$$\text{Earnings} = (2050 \times 2) - (2000+2000) = 100.$$

Your earnings per period and from all periods will be updated at the end of every period on the bottom of your computer screen, and are labeled *Profit this period* and *Total profit from all periods*, respectively. At the end of every period your computer screen will also display *Your price*, the *Other seller's price*, the *Number of units you sold*, and the *Total quantity sold in the market*. (See Figure 2.)

Period: 2 of 5 Remaining time (sec): 54

Units	Price	Cost	Profit
1	2050	2000	50
2	2050	2000	50
3	2050	2000	50
4	0	2000	0

Your price: 2050
Other seller's price: 2050
Number of units you sold: 3
Total quantity sold in the market: 6
Profit this period: 150
Total profit from all periods: 350

continue

Figure 2: Example Market Trading Screen for Sellers.

Notice that if a unit costs more than the amount for which you sell it then you suffer a loss in earnings on that unit. If you do not sell any units in a period then your earnings are zero for that period. Importantly, you do not incur the cost of a unit unless you sell that unit.

How to Sell

In each period you post a SELLING PRICE. Note that both you *and* the seller you are paired with must post a selling price which is a multiple of 50. You also select a QUANTITY. This limit represents the maximum number of units that you are willing to sell AT THE SELLING PRICE. You may offer as many units as you have available. However, if the posted price does not exceed the cost of all offered units, you lose earnings. You will enter selling prices and quantity using your computer. Figure 1 shows the market trading screen as seen by sellers. You submit selling prices and quantity limits using the “Selling Price” and “Quantity” box in the lower center of the screen, and then clicking on the “Continue” button. Once the selling price and the quantity are submitted, they are binding in the sense that the buyer can buy some or all of the units offered. This results in an immediate trade at the posted price.

The selling prices and the quantities of all the sellers are then given to the buyer, and the buyer may then purchase as much as he wishes from those goods that have been made available to him. A period ends when the buyer finishes making purchases, or when all sellers are out of units.

Recording Rules for Sellers

Your earnings per period and from all periods will be updated at the end of every period on the bottom of your computer screen, and are labeled *Profit this period* and *Total profit from all periods*, respectively. At the end of every period your computer screen will also display *Your price*, the *Other seller's price*, the *Number of units you sold*, and the *Total quantity sold in the market*. Your Personal Record Sheet contains 7 columns. At the end of a trading period you should write down the price you posted in column (2), the other seller's price in column (3), the units you sold in column (4), the number of units sold in the market in column (5), the per period profit in (6), and the total profit from all periods in (7). At the end of the experiment you will divide your total profit from all periods by the conversion rate to determine your total earnings in real Dollars.

Summary

- Sellers post selling prices and quantities. In making a price/quantity posting, the seller indicates a willingness to sell the posted number of units at the selling price
- There is one buyer who is played by the computer
- The buyer will purchase a total of 6 units, if 6 units are available at prices of \$550 or below. The buyer will purchase no units priced above \$550
- If two sellers post identical prices, then the buyer will randomly choose which seller to approach first
- Seller earnings = (selling price \times number of units sold) – (production cost of units sold)
- A period ends when the buyer finishes to make his purchases, or when all sellers are out of units
- At the end of the period your computer screen displays:
 - (7) Your price
 - (8) The price posted by the other seller
 - (9) Number of units you sold
 - (10) Total quantity sold in the market
 - (11) Your profit this period
 - (12) Your profit from all periods
- Sellers should record these on Record Sheets at the end of each period

Are there any questions now before we begin the experiment?

Personal Record Sheet for Subject _____

Period	Your Price	Other Seller's Price	Units you sold	Units sold in the market	Period Profit	Total Profit from all periods
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1						
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Period	Your Price	Other Seller's Price	Units you sold	Units sold in the market	Period Profit	Total Profit from all periods
(1)	(2)	(3)	(4)	(5)	(6)	(7)
31						
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- 7) The buyer will purchase a total of 6 units, if 6 units are available at prices of \$550 or below. The buyer will purchase no units priced above \$550.

- 8) The buyer will purchase first from the seller posting the lowest price, then from the seller posting the second lowest price. Once a seller has been selected, the buyer will purchase all units that can be afforded from that seller. If the buyer finishes making purchases from one seller and still wishes to buy more units, then the buyer will switch to the other seller.

- 9) If two sellers post identical prices, then the buyer will randomly choose which seller to approach first.

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Period: 1 of 5 Remaining time (sec): 19

Units	Price	Cost	Profit
1	.	2000	.
2	.	2000	.
3	.	2000	.
4	.	2000	.

Selling Price:
Quantity:

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3	2050	2000	50
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Your price: 2050
Other seller's price: 2050
Number of units you sold: 3
Total quantity sold in the market: 6
Profit this period: 150
Total profit from all periods: 350

continue

Figure 2: Example Market Trading Screen for Sellers.

Notice that if a unit costs more than the amount for which you sell it then you suffer a loss in earnings on that unit. If you do not sell any units in a period then your earnings are zero for that period. Importantly, you do not incur the cost of a unit unless you sell that unit.

How to Sell

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Recording Rules for Sellers

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Summary

- Sellers post selling prices and quantities. In making a price/quantity posting, the seller indicates a willingness to sell the posted number of units at the selling price
- There is one buyer who is played by the computer
- The buyer will purchase a total of 6 units, if 6 units are available at prices of \$550 or below. The buyer will purchase no units priced above \$550
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- Seller earnings = (selling price \times number of units sold) – (production cost of units sold)
- A period ends when the buyer finishes to make his purchases, or when all sellers are out of units
- At the end of the period your computer screen displays:
 - (13) Your price
 - (14) The price posted by the other seller
 - (15) Number of units you sold
 - (16) Total quantity sold in the market
 - (17) Your profit this period
 - (18) Your profit from all periods
- Sellers should record these on Record Sheets at the end of each period

Are there any questions now before we begin the experiment?

Personal Record Sheet for Subject _____

Period	Your Price	Other Seller's Price	Units you sold	Units sold in the market	Period Profit	Total Profit from all periods
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1						
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Period	Your Price	Other Seller's Price	Units you sold	Units sold in the market	Period Profit	Total Profit from all periods
(1)	(2)	(3)	(4)	(5)	(6)	(7)
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60						
				Divide by	Conversion Rate	
					Converted Total	

