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Introduction

These experimental instructions were given to subjects who participated in the research described in the manuscript entitled “The Problem of Free Riding in Voluntary Generic Advertising: Parallelism and Possible Solutions from the Lab,” which will be published in the *American Journal of Agricultural Economics*.

Experiment Instructions – Part A

This is an experiment in the economics of decision making. In the course of the experiment, you will have opportunities to earn money. Any money earned during this experiment is yours to keep. It is therefore important that you read these instructions carefully. Please do not communicate with other participants during the experiment.

In this experiment, you will participate in a series of market trading periods. You will be given the opportunity to sell units of a fictitious commodity. On the next page is an example of what your computer screen will look like during the experiment. The table gives you the **costs** you have for each of your three units of the fictitious commodity. Note your units one and two will have the same cost. In this hypothetical example, your first and second units have a **cost** of \$6.00 and your third unit has a cost of \$9.00.

You must decide at what price you want to offer to sell each of your units. You submit your **offer prices** by entering them into your spreadsheet, hitting ENTER, and clicking the SUBMIT button after you have entered all three offer prices. In this example for Round 1, the **offer price** is \$6.00 for Unit 1 and Unit 2 and \$9.00 for Unit 3.

After each of the twenty subjects have submitted their offer prices, the auctioneer will determine how many units will be purchased, the market price for these units, and which

participants sold units of the commodity. The demand for units will vary in trading periods and the **market price** will be determined *by the price of the first rejected offer* (see the next page for further explanation). In the example, the uniform market price is \$8.00 in Round 1 and the seller sells the first and second units. For Round 1, the seller earns a profit of \$4.00 [$2 \times (\$8 - 6) = \4].

In this example, for Round 2, the offer prices are again \$6.00 and \$9.00. The market price is \$10.00 and the seller sells all three units. Therefore, the seller's profit for Round 2 is \$9.00 [$2 \times (\$10 - 6) = \8 ; $\$10 - 9 = \1].

[You may wonder why the offer prices in this example are **equal to** the costs. Generally, in a competitive situation, it is ***in your best interest*** (*make the most money*) to submit offer prices equal to cost. Since the market price that you receive for each unit sold is set by the *first rejected offer*, the market price you receive will be **higher than** the cost of any units you sell. If you submit an offer price higher than your cost, you may miss an opportunity to make a profitable trade.]

In general, your costs may not be the same as those of other sellers. Keep in mind that the numbers used in these tables are for instructional purposes only and may not look at all like the numbers you will see during the experiment.

| | | <i>Round 1</i> | <i>Round 2</i> |
|----------------------|----------------|----------------|----------------|
| Unit 1 | Cost: | \$ 6.00 | \$ 6.00 |
| | Offer: | \$ 6.00 | \$ 6.00 |
| | Sold: | Yes | Yes |
| | Profit: | \$ 2.00 | \$ 4.00 |
| | | | |
| Unit 2 | Cost: | \$ 6.00 | \$ 6.00 |
| | Offer: | \$ 6.00 | \$ 6.00 |
| | Sold: | Yes | Yes |
| | Profit: | \$ 2.00 | \$ 4.00 |
| | | | |
| Unit 3 | Cost: | \$ 9.00 | \$ 9.00 |
| | Offer: | \$ 9.00 | \$ 9.00 |
| | Sold: | No | Yes |
| | Profit: | \$ - | \$ 1.00 |
| | | Submit | Submit |
| Market Price: | | \$ 8.00 | \$ 10.00 |
| | | Update | Update |
| Total Profit: | | \$ 4.00 | \$ 9.00 |

Determination of Demand

The **demand** will vary in each trading period from **40 to 46 units** with an average of **43 units** being purchased. In the front of the room is a bag containing sixteen balls. The balls are labeled as following:

- 40 (1 ball)
- 41 (2 balls)
- 42 (3 balls)
- 43 (4 balls)
- 44 (3 balls)
- 45 (2 balls)
- 46 (1 ball)

After all of the offer prices have been collected, a volunteer subject will draw one of these balls and this will be the number of units purchased. For example, if the ball drawn is 42, then the auctioneer will purchase 42 units. The ball will be replaced after every round.

Determination of Market Price

The price at which all units trade (referred to as the **market price**) will be determined as follows. Imagine that there are eight units trying to be sold in the market. First, the auctioneer ranks in order all **offer prices** from lowest to highest. For example, imagine that the **offer prices**, ranked from lowest to highest, are:

| | | | | | | | | |
|----------------------|-----|-----|-----|-----|-----|------------|-----|------|
| Offer Prices: | \$3 | \$4 | \$5 | \$6 | \$7 | \$8 | \$9 | \$10 |
|----------------------|-----|-----|-----|-----|-----|------------|-----|------|

Units are traded in order (from left to right) until the buyer (the auctioneer) purchases all of the units needed. In the example, the five lowest offer prices are purchased (listed in gray). The market price is determined by the **price of the first rejected offer**, in this case **\$8.00**. All of the units purchased are sold at the market price of \$8.00. In the case of a tie in offer prices, the offer received first will be ranked first (to the left).

After all offer prices have been received, the market price will be computed and the results announced. The auctioneer will announce the market price and which participants sold units. You will then hit the UPDATE button and you will learn the market price and whether or not you sold your units. The computer will then calculate your profits for that round and keep track of your cumulative earnings.

An exchange rate is used to convert your earnings from experimental dollars to US dollars. For example, if your exchange rate is 2.30, then 2.30 experimental dollars is equal to \$1 US.

Procedure for Selling Units:

1. In each round, you will enter your offer prices for each of your three units. Note that you cannot submit offers that are less than the cost. Hit ENTER after each offer price and then click the SUBMIT button.
2. After all of the offer prices have been finalized, the auctioneer will determine the market price and which participants sold units of the commodity. The market price again will be determined *by the price of the first rejected unit*.
3. Upon notification from the administrators, click the UPDATE button. Your spreadsheet will show you the Market Price and whether you sold each of your three units. Profit for each unit and Total Profit for the round will be calculated automatically.

It is important that you clearly understand these instructions.

Please raise your hand if you have any questions.

Experiment Instructions – Part B

This part of the experiment will operate in much the same way as Part A as you again will be given the opportunity to sell units of a fictitious commodity. However, in this part, the sales of your commodity will be charged an **assessment** based on the number of units you sell. The **assessment** is \$0.25 per unit sold.

The total assessments collected from all of the subjects will be used to finance an **advertising campaign** to increase the total demand for the commodity. The more that is spent on advertising, the more units the auctioneer will buy the *next round* (as explained below). Previous experiments have shown substantial increases in both prices and profits in

response to advertising programs. The assessments are automatically deducted from your profits.

However, you can request a refund of *some or all* of the assessments that you paid. To request a refund, you need to type the amount of refund you would like in the **refund request** box, hit ENTER, and click the REFUND button. Once you click the REFUND button, you need to send the following phrase in the box provided: “Subject # requests a refund of \$0.## for Round #. Sincerely, (*your name*)”

If you request a refund, you will receive that money in that round. Note that assessments that are refunded are not available for the advertising campaign and therefore will not help increase demand in the subsequent period.

Determination of Demand

As mentioned earlier, the total assessments collected will be used to finance an advertising campaign to increase the total demand for the commodity. This increase in demand will increase the number of units sold and should increase the market price. Consequently, the advertising campaign should increase your profits. The advertising will increase demand by the following formula:

$$\text{Increase in demand} = \text{Total assessments collected} \times \frac{2}{3}$$

For example, if the total assessment collected is \$6.00, then advertising would increase demand by four units ($6 \times \frac{2}{3} = 4$). Note that refund requests reduce the total assessments collected for the advertising campaign and therefore reduce the number of units that will be purchased in the next period and reduce the market price. A table listing the potential impact of advertising (assuming no one requested a refund) is listed below.

The demand will be determined exactly as before in Part A except that advertising has been added. For example, if the ball drawn is 42, and the advertising campaign raised demand by 4 units, then the auctioneer will purchase a total of 46 units.

Note: The total assessments collected in Round 16 in Part B affects the demand in the Round 17 in Part C *exactly* as described for Part B.

You will be given **up to five minutes** to discuss the advertising program with other subjects in the experiment. The discussion of the advertising program is open, except that no deals or threats are allowed.

Note: that most of your profits come from selling your first two units which have a low cost. Therefore, a higher price yields higher profits, even if the increase in demand as a result of the advertising program does not result in you being able to sell your third unit.

Procedure for Selling Units:

1. In each round, you will enter your offer prices for each of your three units. Hit ENTER after each offer price and then click the SUBMIT button.
2. After all of the offer prices have been finalized, the auctioneer will determine the market price and which participants sold units of the commodity. Upon notification from the administrators, click the UPDATE button.
3. After the market price and sellers have been announced, you can decide whether or not you would like a refund. If you would like a refund, enter the refund amount into the spreadsheet, hit ENTER, click the REFUND button, and send the message which includes your subject #, the round #, and the amount of refund requested.

4. In the next round, the administrators will determine the total amount of assessments collected in the previous round and announce the resulting increase in demand.
5. The administrators will announce the total assessments collected, but will not indicate which (if any) subjects requested a refund.

Impact of Advertising Campaign

If no refund requests are made

| Units Sold | Total Possible (\$0.25 x units) | Times 2/3 | Increase in Demand (units) | Expected Price (next round) |
|------------|---------------------------------|-----------|----------------------------|-----------------------------|
| 1 | \$0.25 | 0.167 | 0 | \$1.46 |
| 2 | \$0.50 | 0.333 | 0 | \$1.46 |
| 3 | \$0.75 | 0.500 | 1 | \$1.60 |
| 4 | \$1.00 | 0.667 | 1 | \$1.60 |
| 5 | \$1.25 | 0.833 | 1 | \$1.60 |
| 6 | \$1.50 | 1.000 | 1 | \$1.60 |
| 7 | \$1.75 | 1.167 | 1 | \$1.60 |
| 8 | \$2.00 | 1.333 | 1 | \$1.60 |
| 9 | \$2.25 | 1.500 | 2 | \$1.75 |
| 10 | \$2.50 | 1.667 | 2 | \$1.75 |
| 11 | \$2.75 | 1.833 | 2 | \$1.75 |
| 12 | \$3.00 | 2.000 | 2 | \$1.75 |
| 13 | \$3.25 | 2.167 | 2 | \$1.75 |
| 14 | \$3.50 | 2.333 | 2 | \$1.75 |
| 15 | \$3.75 | 2.500 | 3 | \$1.91 |
| 16 | \$4.00 | 2.667 | 3 | \$1.91 |
| 17 | \$4.25 | 2.833 | 3 | \$1.91 |
| 18 | \$4.50 | 3.000 | 3 | \$1.91 |
| 19 | \$4.75 | 3.167 | 3 | \$1.91 |
| 20 | \$5.00 | 3.333 | 3 | \$1.91 |
| 21 | \$5.25 | 3.500 | 4 | \$2.07 |
| 22 | \$5.50 | 3.667 | 4 | \$2.07 |
| 23 | \$5.75 | 3.833 | 4 | \$2.07 |
| 24 | \$6.00 | 4.000 | 4 | \$2.07 |
| 25 | \$6.25 | 4.167 | 4 | \$2.07 |
| 26 | \$6.50 | 4.333 | 4 | \$2.07 |
| 27 | \$6.75 | 4.500 | 5 | \$2.25 |
| 28 | \$7.00 | 4.667 | 5 | \$2.25 |
| 29 | \$7.25 | 4.833 | 5 | \$2.25 |
| 30 | \$7.50 | 5.000 | 5 | \$2.25 |

| Units Sold | Total Possible (\$0.25 x units) | Times 2/3 | Increase in Demand (units) | Expected Price (next round) |
|------------|---------------------------------|-----------|----------------------------|-----------------------------|
| 31 | \$7.75 | 5.167 | 5 | \$2.25 |
| 32 | \$8.00 | 5.333 | 5 | \$2.25 |
| 33 | \$8.25 | 5.500 | 6 | \$2.44 |
| 34 | \$8.50 | 5.667 | 6 | \$2.44 |
| 35 | \$8.75 | 5.833 | 6 | \$2.44 |
| 36 | \$9.00 | 6.000 | 6 | \$2.44 |
| 37 | \$9.25 | 6.167 | 6 | \$2.44 |
| 38 | \$9.50 | 6.333 | 6 | \$2.44 |
| 39 | \$9.75 | 6.500 | 7 | \$2.64 |
| 40 | \$10.00 | 6.667 | 7 | \$2.64 |
| 41 | \$10.25 | 6.833 | 7 | \$2.64 |
| 42 | \$10.50 | 7.000 | 7 | \$2.64 |
| 43 | \$10.75 | 7.167 | 7 | \$2.64 |
| 44 | \$11.00 | 7.333 | 7 | \$2.64 |
| 45 | \$11.25 | 7.500 | 8 | \$2.86 |
| 46 | \$11.50 | 7.667 | 8 | \$2.86 |
| 47 | \$11.75 | 7.833 | 8 | \$2.86 |
| 48 | \$12.00 | 8.000 | 8 | \$2.86 |
| 49 | \$12.25 | 8.167 | 8 | \$2.86 |
| 50 | \$12.50 | 8.333 | 8 | \$2.86 |
| 51 | \$12.75 | 8.500 | 9 | \$3.08 |
| 52 | \$13.00 | 8.667 | 9 | \$3.08 |
| 53 | \$13.25 | 8.833 | 9 | \$3.08 |
| 54 | \$13.50 | 9.000 | 9 | \$3.08 |
| 55 | \$13.75 | 9.167 | 9 | \$3.08 |
| 56 | \$14.00 | 9.333 | 9 | \$3.08 |
| 57 | \$14.25 | 9.500 | 10 | \$3.32 |
| 58 | \$14.50 | 9.667 | 10 | \$3.32 |
| 59 | \$14.75 | 9.833 | 10 | \$3.32 |
| 60 | \$15.00 | 10.000 | 10 | \$3.32 |

Experiment Instructions – Part C

You now have the opportunity to vote on which market rules you like to use for the next five trading periods. There are two options:

- 1) **No Program.** The market would function identically to Part A. Since there are no assessments collected, the number of units purchased by the auctioneer will be determined in an identical manner to Part A.
- 2) **Mandatory Assessment; No Refund.** Everyone would continue to be assessed on the number of units they sell, however, no one would be able to request a refund. The assessments collected in each round will continue to be used for the advertising campaign and thus affect the number of units purchase by the auctioneer as described previously.

Note: that whatever assessments collected in Round 16 in Part B will influence the demand for units in Round 17 in Part C. After Round 17, the demand will be influenced by the outcome of the vote. Likewise, the assessments collected in Round 21 in Part C will affect demand in Round 22 in Part D.

A **majority vote** will determine which market rules will be implemented. Your vote will be confidential and will not be shared with other members of the experiment.

Before the vote, you will be given **up to five minutes** to discuss your opinion with other subjects in the experiment. The discussion about the vote is open, except that no deals or threats are allowed.

After the discussion, please submit your vote by selecting your preference in your spreadsheet and clicking the SUBMIT VOTE button. After all of the votes have been submitted, the administrators will announce the outcome.

Experiment Instructions – Part D

This part of the experiment will operate in much the same way as Part B, as you will again be assessed based on the number of units you sell and you will also be given the opportunity to request a refund of assessments collected.

Again, the total assessments collected from all of the subjects will be used to finance an advertising campaign to increase the total demand for the commodity. The more that is spent on advertising, the more units the auctioneer will buy in the *next round*. Previous experiments have shown substantial increases in both prices and profits in response to advertising programs. The assessments are deducted from your profits. Again, you can request a refund by sending an instant message to the administrators.

However, in this part, the assessments will only be collected and the advertising campaign funded, if **70% or more** of the subjects **do not request a refund**. In other words, if 14 or more of the 20 subjects in the room do not request refunds, then the advertising campaign will be implemented. If funded, the advertising campaign will affect the demand for units as described previously.

If the total percentage of subjects that **do not request a fund** is **less than 70%**, then everyone will get a refund, no assessments will be collected, and the advertisement campaign will be not be funded. In other words, if 7 or more of the 20 subjects in the room request refunds, than everyone will receive refunds and the advertising campaign will not be funded.

If the total percentage of subjects not requesting a refund is **less than 70%**, then **all** subjects receive a refund. Note that if the group refund is “Yes”, then you receive a refund of your entire assessment whether or not you requested one. The administrators will announce

the total assessments collected for the following period, how many subjects did not request refunds, and whether **70% or more** of the subjects did not request a refund.

Again, you will be given **up to five minutes** to discuss your opinion regarding the advertising program with other subjects in the experiment.

Procedure for Selling Units:

1. In each round, you will enter your offer prices for each of your three units. Hit ENTER after each offer price and then click the SUBMIT button.
2. After all of the offer prices have been finalized, the auctioneer will determine the market price and which participants sold units of the commodity. Upon notification from the administrators, click the UPDATE button.
3. After the market price and sellers have been announced, you can decide whether or not you would like a refund. If you would like a refund, enter the refund amount into the spreadsheet, hit ENTER, click the REFUND button, and send the message which includes your subject #, the round #, and the amount of refund requested.
4. After determining whether the subjects requesting refunds is greater or less than 70%. The administrator will announce whether the advertising campaign is funded or whether there is a group refund. If there is a group refund, the spreadsheet will refund you the amount of assessments that you had paid minus the amount of refund you requested (if any) after you click the UPDATE button.