Who Wants an iPad? An Exercise In Rationing

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ABSTRACT

This active learning exercise demonstrates the fundamental problem in economics that resources are scarce, while wants are relatively infinite. Students are exposed to four mechanisms for rationing scare resources: markets, queue, coupons, and lottery. An Apple iPad® pre-loaded with music, videos, and games is used as the good to be rationed. The uncertain value of the good allows for differences in willingness to pay. Students are guided through an exercise that highlights the efficiency/equity tradeoffs in different allocation mechanisms by observing who gets the iPad in each round and whether any secondary market transactions occur to change the allocation.

Keywords: Scarcity; Rationing; Pedagogy

INTRODUCTION

Due to scarcity, societies must constantly make choices regarding the allocation of products available in limited quantities. The allocation mechanism dictates who ends up with the scarce product and will also determine how people in the economy will behave. This lesson was developed while teaching principles using the Stiglitz (1993) economics principles textbook. The use of terminology in this lesson derives from Chapter 2 in the Stiglitz (1993) text.

In this demonstration, students are exposed to the concepts of allocation mechanisms, secondary markets, choice corruption, efficiency versus equity, free market versus central planning, opportunity cost, scarcity, value of leisure time, and willingness to pay. After completing this demonstration students will be able to:

1. Acknowledge that demand comes from people's willingness to pay for products
2. Recognize that free markets allocate scarce products according to people's willingness to pay for those products and deliver products to those with the highest willingness to pay
3. Conclude free markets are not necessarily "equitable"
4. Acknowledge that other methods of rationing (by queue, coupons, or lottery) will allocate goods differently
5. Predict that people will be motivated to create secondary markets and re-allocate goods when rationing mechanisms ***other than*** the free market are employed
6. Recognize that rationing mechanisms other than free market rationing open up the possibility of discrimination and corruption
7. Observe that people's behavior indicates they prefer an efficient system over an equitable system

BACKGROUND

This activity contributes to the expanding literature on using experiments and games in a principles of economics course. For an overview see Holt (1999) and Hazlett (1999). The increased use of active learning for economic principles has led to some work evaluating the effectiveness of these activities. Prior research showed that these activities did not have a statistically significant impact. However, Dickie (2006) used a better research design to show that indeed experiments do contribute to learning. These contributions are largest when there is no grade incentive attached to the participation or outcome of the activity. Dickie's (2006) research design had a control-group and

treatment group. He used a pretest/posttest evaluation strategy with standard economic questions and performance on the *Test of Understanding in College Economics* (TUCE).

Two closely related works are Goeree and Holt (1997) and Alden (2006). Goeree and Holt (1997) presented an experiment that shows the inefficiency of a nonmarket allocation mechanism. The experiment asked students to campaign to purchase a license for cell phone service. The rent-seeking activities that arose from rationing by coupon were inefficient. Alden (2006) presented an activity in which students develop a demand curve and calculate consumer surplus based on their willingness to wait in line for candy. That activity is an example of rationing by queue. The author used the time in line as a proxy for willingness to pay. Here, we highlight that willingness to pay and willingness to wait are not the same. Rationing by market and rationing by queue are not equally efficient.

ACTIVITY

The demonstration is used in a class of 15 or more students and takes approximately 50-75 minutes to complete. To prepare for this lesson the faculty member needs to bring (or borrow) an Apple iPad or other electronic device that is preloaded with music, videos, or games. The iPad is used only for demonstration. You are not actually going to give it away. It is important that the iPad is *not* new and comes pre-loaded with music, videos, and apps so the exact value of the iPad is unknown, or at least is not equal to the current price in stores. In addition to the iPad, you need to prepare and print eight coupons that say, "The bearer of this coupon may purchase one iPad for $100." You will also need to generate a random number for each student in the class. This random number will be used for the rationing by lottery. Prepare and print approximately eight "lottery tickets" to distribute to the winners. In general, the number of coupons should amount to only 5-10% of your class. The experiment works best when the vast majority of the students are left out.

We selected eight as the number of the good to be rationed in a class of approximately 120 students. Eight seems to be sufficient to get the idea across and still be able to run and record the demonstration.[1]

PART 1: RATIONING BY MARKETS

Begin by describing the iPad in your hand. Emphasize the fact that the iPad in your hand has music and videos loaded that do *not* come with a new one purchased in a store or online. You may want to describe/play some of the songs or clips as time allows. Ask the students to write down the maximum amount they would be willing to pay to obtain the iPad.

Prepare to write a table with columns of P and Q on the board. Then ask the following series of questions:

- "How many of you would want this iPad if the price was zero?"
- "How many of you would buy this iPad if the price was $50?"
- "How many of you would buy this iPad if the price was $100?

Continue asking the question until no students in your class are raising their hands. Graph the combinations of P and Q on the board. Ask the students what curve you've just created. (It's the class demand curve for the iPad!) Note that demand is derived directly from willingness to pay!

Next, pick a price from your demand curve (for example, suppose when P = $500, $Q^D = 8$). Tell your class that there are actually eight iPad's available to them in a free-market auction. Ask your class which 8 students in the class will get the iPads in the auction and what the price will be. Point out that the 8 students who get the iPads are the same 8 with the highest willingness-to-pay.

[1] In general, the number of coupons should amount to only 5-10% of your class. The experiment works best when the vast majority of the students are left out.

Finally, ask your class if there is anyone willing to pay to buy one of the 8 iPads from one of the 8 initial buyers. (There shouldn't be, since no one in the class should have a higher willingness to pay than the 8 students who got the iPads.) Point out that there is no incentive for further allocation when a free-market mechanism is used.

If you've covered consumer surplus, this can be a nice time to discuss who gets the most surplus from the free market allocation. If you haven't covered consumer surplus yet, it still might be worth making a note of the differences between the market price and willingness-to-pay. You can then refer back to this lesson later in the semester.

PART 2: RATIONING BY QUEUE

For the second part of the lesson, inform your class that the 8 iPad's from part 1 will be given ***free*** to the first 8 people standing in line at your office at 8am the next Saturday. Ask your students to consider *when* they will show up to get in line. Have them write down the time they'll get in line in their notes, so they commit to an answer. Begin polling your class by asking:

- "Who will be in line at 7AM on Saturday morning"
- "Who will be in line at 6AM on Saturday morning"
- "Who will be in line at 5AM on Saturday morning"

Go back in time far enough to include all of your class, so you can figure out who the first 8 in line will be. Now ask your class which 8 students get the iPads. Point out that they are not necessarily the same 8 students who got the iPads before. Have this new group of students move to the front of the class as before.

Finally, ask the 8 students who were the first in line if they're willing to sell their iPads at some price. Also, ask the rest of your class if anyone is willing to offer money to the 8 for their iPads. (You may need to help things along by pointing out a student or two in the audience who had a high willingness-to-pay, and some students at the board who have relatively low willingness-to-pay. *"If the iPad is worth $600 to you, and only $400 to her, can you think of a trade that might make you both better off?"*) Have your students arrange the most beneficial trades possible. Point out that the 8 students with the highest willingness-to-pay now have the iPads.

Point out that a secondary market has formed and serves to reallocate scarce goods back to the free market outcome. Further point out that much time is wasted in this scenario, both in waiting in line and in negotiating secondary market contracts.

PART 3: RATIONING BY COUPONS

Prior to class, write up simple coupons that say, "The bearer of this coupon may purchase one iPad for $100." Prepare about 8 coupons. Announce to your class that someone in class is going to be appointed as the "benevolent social planner". This person is the government bureaucrat who gets to assign the coupons to anyone they choose. Then pick someone in the class to fill this role and pass out the 8 (in this example) coupons. Note that the student getting the coupons may simply choose to keep them, or they may give them all to their friends.

Point out that the iPads now go to whomever the government chose. Ask the people with coupons if they are all willing to pay $100 for the iPad (some with coupons may not want to pay $100 for the iPad). Ask the class whether they think the benevolent social planner was equitable in their allocation of coupons.

Now ask the class if anyone wants to buy an iPad from someone who got one with a coupon. Allow the class to negotiate the most beneficial trades possible. Point out that even with a "benevolent" allocation, the incentives exist to bring about the free market outcome.

PART 4: RATIONING BY LOTTERY

Prior to class, generate random numbers for each student in your class. Tell your class that the iPads are being assigned randomly. Pass out coupons for the iPads based on your random number generation. Ask the class who gets the iPads

now. Again, it is not the same group of students as got the iPads in rationing by market. Again, ask the class if there are any beneficial trades that could be made. As before, the secondary market will reallocate the iPads or coupons back to the students with the highest willingness to pay.

Point out that the class has seen free markets, and three different attempts to institute something that is more "equitable" or "equitable". What happened every time the market process was circumvented? Secondary markets re-allocated the iPads back to the people with the highest willingness to pay.

CONCLUSION

Concluding discussion and wrap-up could take multiple forms. Here are some ideas for reinforcing this lesson:

- Discussion of the lesson in class or in a recitation section. What kinds of goods and services do we ration using the market? What kinds of goods and services do we ration in other ways? (A few examples: health care, concert tickets, kidneys, college degrees.) Is the way we allocate these goods and services efficient? Is it equitable? How do other societies allocate these goods? How does the allocation choice affect the distribution of consumer surplus?
- Refer back to the lesson as appropriate in later lectures.
- A short written assignment: Describe an experience in your life when you faced scarcity and had to participate in some allocation mechanism. State how the allocation mechanism affected your behavior. Was the allocation efficient? Was it equitable?

In a principles of economics course, most of the time is spent discussing the market allocation mechanism. The interactive lesson described here exposes students to alternate allocation mechanisms and can be referenced throughout the course as additional related topics are covered. In doing so, students recognize the trade-off between equity and efficiency in the allocation of goods and services.

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REFERENCES

Alden, L. (2006). Rationing a "free" good: A classroom experiment. *The Journal of Economic Education, 37*(2), 178-186.

Dickie, M. (2006). Do classroom experiments increase learning in introductory microeconomics? *The Journal of Economic Education, 37(*3), 267-288.

Goeree, J. K., & Holt, C. A. (1997). Rent seeking and the inefficiency of non-market allocations. *Journal of Economic Perspectives.*

Hazlett, D. (1999). *Economic experiments in the classroom.* New York, NY: Addison Wesley.

Holt, C. A. (1999). Teaching economics with classroom experiments: A symposium. *Southern Economic Journal,* 603-610.

Stiglitz, J. E. (1993). Economics. New York, NY: W.W. Norton.