
Experimental Economics in the Classroom: Reinforcing Selected Concepts Related to Consumer Demand

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Abstract

The purpose of this paper is to illustrate the use of experimental economics to reinforce selected concepts related to teaching the topic of consumer demand. The technique of experimental economics holds appeal for demonstrating the application of economic theory through student participation. The experiment described in this paper provides a classroom opportunity for the discussion of principles and concepts related to consumer demand. The results of the experiment were used both to introduce and reinforce concepts related to consumer demand including: the *ceteris paribus* assumption, individual vs. market demands, law of demand, direct price elasticity, nonprice determinants, and consumer surplus.

Introduction

Students of economics and agricultural economics often criticize both the abstract nature of their subject and the lack of application to real world problems and issues. A primary reason for this is because classes in economics are often theory based. While the teaching of economic theory is essential, if students of economics are not exposed to applications of this theory, learning becomes sterile and the understanding of the principles of economics remains on a very abstract level. Instructors of economics and agricultural economics can ameliorate this problem through the manner in which the subject matter is taught. In particular, one means of achieving greater comprehension of concepts in economics classes is to allow students to participate in experiments designed to simulate various market scenarios or individual decision making circumstances (French and Turner). The purpose of this paper is to illustrate the use of experimental economics to reinforce selected concepts related to the topic of consumer demand.

In general, experimental economics makes use of the approaches and techniques of laboratory experiments in order to test and formulate hypotheses about economic behavior

and the functioning of economic institutions (Wells). Fundamentally, experimental economics is the study of individual choice in the context of an economic institution (Smith). The objective is to set up a laboratory experiment which will create a manageable model of a real-world phenomenon, where adequate control can be maintained and accurate measurements of relevant variables guaranteed (Wilde). As reported by Hoffman and Spitzer, the basic experimental technique includes three features.

- The behavior of economic agents (consumers, students, managers) who follow a set of instructions.
- The instructions and the laboratory experiments are designed to model the environment in which the economic agents participate.
- The experiment, as relayed to the participants by the instructions and incentives, is designed to induce preferences and elicit, for example, price and/or quantity decisions based on these preferences.

While Chamberlin reported the use of laboratory experiments for teaching economics as early as 1948, the use of classroom experiments did not become popular among teachers of economics until recently. The growth in the use of economic experiments for teaching purposes followed the research efforts in experimental economics and its growth as a field of research (Fels). The technique holds appeal for demonstrating application of economic theory, and participating in classroom experiments can enhance students' understanding of economic principles.

The use of classroom experiments in economics and agricultural economics courses does involve some costs. Aside from the start-up costs pertaining to setting up the experiment, an important opportunity cost is the lecture time which must be sacrificed in order to introduce experiments into the classroom. While some instructors likely view classroom experiments as a substitute for the classroom lecture, experiments may be more effective as complements to lectures. As a result, instructors who use classroom experiments may find themselves sacrificing some topic coverage to accommodate the experiments. The decision of whether or not to utilize classroom experiments may be made based on the choice between breadth of topic coverage and depth of student understanding (Delemeeter and Neral). Perhaps the best approach is to use experiments sparingly, e.g., one experiment

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for each major topic area in the course. Moreover, classroom experiments should be simple, thereby reducing the costs associated with sacrificing lecture time, as well as enhancing participation and the comprehension of subject matter by students.

Overview of the Experiment

The experiment described in this paper is simple and takes very little time or effort, but provides a foundation for the discussion of principles and concepts related to consumer demand. This experiment is designed to bridge the gap between abstract economic concepts and an actual classroom experience.

For this experiment, the instructor first asks for three volunteers to be “consumers.” The volunteers are then told they will be asked to indicate how many Snickers Bars (or other product) each would be willing and able to purchase at alternative prices in a series of prices. They are then asked if they are allergic to, or in some other way unable to eat, Snickers Bars. (If this is the case, it may be necessary to select another volunteer.)

Next, each of the volunteer “consumers” is given a roll of nickels (\$2.00) and told that this is theirs to keep, less the amount used to purchase Snickers Bars. Slips of paper identifying the consumer as A, B, or C and containing the statements “At a price of _____, I am willing and able to purchase _____ units. Be sure units * price ≤ \$2.00” are given to the experiment participants. The price blank may be filled in on each slip before class, say from 50¢ to 5¢, in 5¢ increments.

The students are again instructed that they will be asked to identify on the slip of paper how many Snickers Bars each is willing to purchase at a particular price using the two dollars given to them. They are reminded that all they have to spend is \$2.00, and if they wish, they need not spend the entire \$2.00. That is, units multiplied by price must be less than or equal to \$2.00.

Experiment participants are then told that after this exercise is completed, the results will be tabulated on the chalk board. Then, a “market price” will be identified by the instructor. The “consumers” are told they will be given the number of Snickers Bars they indicated at the “market price” in exchange for the appropriate amount of nickels (money). It is made clear that they are expected to pay for the product and remaining nickels are theirs to keep. Finally, the volunteers are asked if they have questions.

Results and Class Discussion

After the experiment, all students are asked to record the results written on the chalk board. An experiment which was recently conducted in an introductory agricultural economics course generated the results reported in Table 1. This consumer demand experiment was completed before introducing the topic of consumer behavior and demand. The results

Table 1. Results from Consumer Demand Experiment

Price (¢)	Units demanded by			Total
	Consumer A	Consumer B	Consumer C	
50	0	0	0	0
45	0	0	0	0
40	0	1	1	2
35	0	2	1	3
30	0	4	2	6
25	1	5	2	8
20	2	7	2	11
15	3	9	10	22
10	4	15	15	34
5	6	20	40	66

were used both to introduce and reinforce concepts related to consumer demand.

These data, which were generated by the students, provided the basis for class discussions of several concepts related to consumer demand. Among the concepts discussed included the following.

- **Ceteris Paribus**—An assumption that all other factors are constant or unchanged. This is an assumption which is easily met using experiments, since control is a characteristic of the experimental method. Using real world data, it is difficult to satisfy the *ceteris paribus* condition and it, therefore, must be assumed to hold.
- **Individual vs. Market Demands**—Individual consumer (A, B, and C) demands are provided by the data reported in Table 1. These individual demand relationships can be summed horizontally at each price, *ceteris paribus*, to derive a market demand. It can be pointed out that, in this case, the market consists of the three volunteer “consumers.”
- **Law of Demand**—There is an inverse relationship between price and quantity demanded of a good or service, *ceteris paribus*. “Lines of best fit” or step functions may be graphed to demonstrate the law of demand for both individual and market demands.
- **Direct or Own Price Elasticity**—The responsiveness of quantity demanded to changes in own or direct price, *ceteris paribus*. The data from the experiment can be used to demonstrate the calculation of elasticity.
- **Nonprice Determinants**—The effects of nonprice determinants of demand also can be discussed. Students can be asked what they might have expected if the experiment were conducted closer to the lunch hour, *ceteris paribus*. (The experiment from which data in Table 1 were obtained was conducted during a 9:00 a.m. class period). They also can be asked what they might expect to happen to market demand if the number of participants had been greater than three, or if each participant had more money to spend. This discussion can reinforce or illustrate what happens

to quantity demanded at each price in a series of prices, *ceteris paribus*, i.e., shifts in demand.

- **Consumer Surplus**—Consumer surplus is the difference between the amount that the quantity of a commodity is worth to the consumer and the amount that the market requires the consumer to pay for that quantity. In other words, consumer surplus is the area under the demand curve above market price. To demonstrate this concept, consider the data generated by Consumer A and a market price of 10¢. If each of the four units at 10¢ were purchased separately, this consumer would have paid 70¢ for them. The market, however, requires this individual to spend only 40¢. Therefore, consumer surplus is 30¢. This concept also can be illustrated by graphing out the step function demand relationship for Consumer A.

Concluding Remarks

The use of experiments in economics and agricultural economics classes allows students to verify theory for themselves. This parallels the teaching approach used in the physical and natural sciences, which typically offer laboratories to reinforce principles and concepts. Thus, the use of experiments in agricultural economics courses may be particularly effective in teaching economic principles to students in other agricultural related disciplines. Fundamentally, students learn from participating in experiments. As economic agents, students test assumptions about human behavior that are built into the economic models.

Economic experiments reinforce the material presented in a traditional lecture format. This approach enables students to experience and discover principles of economics in a laboratory setting.

For the instructor, the actual experiment is a process by which data for analysis are generated. The experiment must be designed with caution, however, so as to not alienate students rather than make them curious about the relationship between experience and economic theory. For the student, a memorable aspect is participation in the experiment. Such an experience can enhance future class discussions, a useful secondary benefit from experiments.

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