Beans as a Medium of Exchange

by

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Purpose of the Experiment

This experiment is an extension of the experiment proposed by Levy and Bergen (1993)[1] and is designed to simulate an environment where something that is very similar to fiat money (i.e., is homogenous, durable, portable, storable, divisible, has no intrinsic value of its own, etc.) will be accepted in market transactions and thus will have a "value". This is accomplished through an implementation of a taxation mechanism in the spirit of legal restriction theory of monetary economics.

Description of the Experiment

The class is divided into groups of 2-4 students and various food items are distributed to them. See the sample menu in Table 1 for an example. The important thing is to include beans in the endowment of some of these groups (Groups No. 3 and 6). The students are told that they can make whatever exchange they wish. Each group is given a Transaction Record Form in which they are asked to record any transaction they make. See a sample form in Table 2.

The transaction period is divided into several subperiods, say five. It is critical that the number of subperiods planned be kept secret from the students. The students are not allowed to eat until after the end of the last subperiod. Each subperiod lasts about 2–3 minutes. At the beginning of the first subperiod we announce that at the end of the first subperiod every group will have to pay certain number of beans as a tax. This makes beans valuable. At the same time we announce that they will have to pay tax (in terms of beans) in the following subperiods also, but the amount will be determined at the end of each subperiod. One way of determining the tax would be to roll a dice.[2] Then, students

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[1] Daniel Levy and Mark Bergen (1993), "Simulating a Multiproduct Barter Exchange Economy," *Economic Inquiry*, Volume 31, April, 314–321.

[2] Note that to avoid an occurrence of "inflation" (a situation where bean looses value) or deflation (bean shortage), the quantity of beans (money) distributed will have to be carefully planned with the number of subperiods in mind.

will need to form expectations about the amount of the tax they will have to pay by estimating probabilities of each possible outcome. Students are "ejected" from the experiment if they do not have enough beans to pay taxes. The experiment ends by closing the market "unexpectedly" at the end of the fifth subperiod.

The Outcome

Since the government accepts the tax payments only in terms of beans, beans start to have a value and after 2–3 subperiods, prices tend to be quoted in terms of beans. Thus, beans start to function as a medium of exchange as well as unit of account. By lengthening the experiment to 6–7 subperiods, beans may even function as a store of value in the sense that students will start accumulating more beans then they expect they will need to pay taxes. Obviously, if the students know the number of subperiods, then they can "rationally" determine the amount of beans they need to accumulate for the future expected taxes. If this happens, then beans will have no value beyond the future expected taxes.

Extension

The experiment can be extended to simulate an economy with inflation/deflation by adjusting the quantity of beans accordingly. This can be useful for simulating the effect of inflationary finance of budget deficit. For this a teacher can step in and buy some real goods using newly issued money (beans). The experiment can also be used to simulated the effect of expansionary monetary policy by injecting "helicopter money" (say buy giving every group 50 new beans as transfer payments).

Table 1. A Menu and Initial Endowment Allocation for a 25 Student Class

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Group No. 1	Group No. 2
3 Tuna Salad Sandwiches	*Häagen-Dazs* ice cream, one quart
3 Ham Sandwiches	16oz *Organic Nasoya Well Water Tofu*
3 Plastic Spoons	3 Plastic Spoons

Group No. 3	Group No. 4
2 Chef's Salads	Plastic Plates (25)
3 Plastic Spoons	Plastic Knives (25), Spoons (3), and
100 Beans	Forks (25)
	Oreo Cookies

Group No. 5	Group No. 6
Ice Cubes in a Plastic Bag	8 Bagels (various tastes)
Salad Dressing (24 Servings)	Plastic Cups (10)
Cream Cheese (6 packs, 8oz each)	3 Plastic Spoons
3 Plastic Spoons	80 Beans

Group No. 7	Group No. 8
2 Chef's Salads	Napkins (pack of 50)
3 Two Liter Diet Coca-Cola	Domino's Pizza (8 Slice Pie)
3 Two Liter Coca-Cola Classic	4 Plastic Spoons
3 Plastic Spoons	

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Table 2. Transactions' Record Form

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Initial No. of Beans: _____   No. Beans, End of Period 1: _____

No. Beans, End of Period 2: _____   No. Beans, End of Period 3: _____

No. Beans, End of Period 4: _____   No. Beans, End of Period 5: _____

No. Beans, End of Period 6: _____   No. Beans, End of Period 7: _____

_____

Name/s of the student/s: _____ _____ _____

Endowment: _____   Final Consumption: _____   Leftover: _____

                _____   _____   _____

                _____   _____   _____

                _____   _____   _____

                _____   _____   _____

                _____   _____   _____

                _____   _____   _____

Transactions List:

_____

Type and Quantity of the Good Sold/Bought	The Price Paid/Received	Period No.
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		