Classroom

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Perceptions of Chance and the Efficient Market Hypothesis: A Classroom Experiment

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Abstract: The efficient market hypothesis is one of the most difficult concepts to teach undergraduate students. This difficulty arises from the false knowledge which students bring to the classroom. Many students are born chartists, like many members of the financial community, certain that predictable patterns exist in stock price data. Most likely these beliefs are due to an inability to distinguish correlated data from uncorrelated data, as observed in psychological studies of the hot hand fallacy and the gambler's fallacy. The classroom experiment described in this article is designed to illustrate students' misperceptions of chance. Students are asked to pick one of five sequences as being uncorrelated over time. The experiment is presented in terms of true/false exams, a natural context for students. Results are consistent with the psychological literature; the modal response is a sequence with slight negative autocorrelation. Follow-up questions and discussions are also described. These are designed to make connections between the experiment, the psychological literatures on perceptions of random sequences, and the efficient market hypothesis.

I. Introduction: The efficient market hypothesis is one of the most difficult concepts to teach undergraduate students. In part, problems arise not because of what students don't know, but rather because of what they think they do know. Many of the students in introductory finance courses have either held jobs in the financial industry or regularly follow the financial press. Neither analysts nor the press hold the efficient market hypothesis in especially high esteem. (After all, why should either group be excited over a theory which makes their professions largely unnecessary?) Instead, analysts and the press provide large doses of prognostication. Often times, these predictions rely on chartist principles. For example, how many times have you heard an analyst say the market was "due for a correction?" Analysis of this sort is based on a fundamental misperception of the random processes governing stock price changes. Many observers speak as if they believe there are predictable patterns in stock prices. For example, when an analyst speaks of the market being due for a correction, he/she is implicitly saying that price changes are negatively correlated over time. This belief flies not only in the face of the efficient market hypothesis, but also in the face of extensive empirical evidence suggesting that stock price changes are uncorrelated over time.[1]

To understand how these misperceptions can persist, we must turn to the cognitive psychology literature on perceptions of random sequences. Psychologists have documented a pair of common fallacies, the hot hand fallacy and the gambler's fallacy. Under the hot hand fallacy, observers believe that random sequences with no autocorrelation actually exhibit positive correlation. The classic article on this topic is Gilovich, Vallone, and Tversky (1985). The authors study belief in the hot hand by basketball experts. The vast majority of serious basketball fans, basketball players, and coaches believes that a player who has made several shots in a row (has a hot hand) is more likely than usual to make his next shot. In other words, experts believe that there is positive correlation over time in making basketball shots. As Gilovich *et al* convincingly demonstrate, no such positive correlation exists. The hot hand fallacy represents a fundamental difficulty individuals have in recognizing uncorrelated data.

The gambler's fallacy refers to beliefs that outcomes which have not occurred for some time are "due" or that recent outcomes are unlikely to be repeated. For example, Clotfelter and Cook (1993) study betting in state lotteries. They find that betting on winning numbers typically decreases for the next few days. Presumably this decrease reflects beliefs that these numbers are relatively unlikely to be drawn because of their recent occurrence. The nature of the gambler's fallacy is somewhat subtle. Only the most dedicated paranoiac would believe that big state lotteries are anything other than random draws from a fixed distribution.[2] Rather, this fallacy represents a misunderstanding of how uncorrelated random sequences behave over time.

Both fallacies probably arise from the same cause--individuals systematically underestimate the number of runs likely in uncorrelated data. Thus, seeing many runs

[1] Malkiel (1990), in chapter 8, gives a readable summary of the main attacks against the random walk hypothesis along with refutations for each.

[2] As a resident of Pennsylvania, I should note that this isn't entirely true. Nick Perry, the host of the state lottery's T.V. show, was actually arrested several years ago for fixing the lottery.

in a data series, they surmise that the data has positive autocorrelation. Likewise, if they know a data series has no correlation over time, they expect few runs and particularly expect long runs to be unlikely to persist.

In sum, teaching the efficient market hypothesis to undergraduate students runs afoul of commonly held, deeply seated misperceptions of random sequences. To teach this concept effectively, a valuable first step is to break down the students' misperceptions. The classroom experiment described in this article is designed for just this purpose. Students are presented with several series of answers from true/false exams. They are told that only one of the series is truly random while the others contain predictable patterns. Students are asked to identify the random series. Students who correctly identify the series with no correlation over time receive a small monetary prize. Invariably, the modal selection is a sequence with moderate negative correlation over time.

This experiment is a psychological experiment, not an economic experiment. Thus, it is critical that the follow-up discussion link the experiment with the efficient market hypothesis. The follow-up material is designed to make three points: (1) even in an environment for which students are experts (true/false exams), they were generally unable to recognize truly random data, (2) there exists an extensive body of evidence suggesting that even experts frequently fall victim to the hot hand fallacy and the gambler's fallacy, and (3) the widely held beliefs of analysts that changes in stock prices exhibit patterns can be best explained in terms of these fallacies. Ultimately, the experiment and related activities should help students abandon their preconceived notions about how security prices behave and leave them receptive to new ideas like the efficient market hypothesis.

Section II gives some background information about the classes this experiment was used for and describes the experiment. Section III presents the results of classroom sessions and describes follow-up activities. Section IV presents some evidence on the effectiveness of the experiment and speculates on how the experiment might be improved in the future.

II. The Experiment: This experiment was designed for use with an introductory corporate finance course at the University of Pittsburgh. This is an upper division class so most students are either juniors or seniors. Virtually all of the students are economics majors who have already taken intermediate microeconomics and macroeconomics, and so have also taken an introductory finance course offered by our business school. Many of the students have taken some sort of statistics course, although few have any real understanding of statistics beyond a few memorized formulas.[3]

This experiment typically is run early in the semester. Students have already had a brief introduction to the efficient market hypothesis prior to the experiment, and have been shown some statistical evidence in its favor. A single eighty-minute lecture usually suffices to run this experiment and discuss the results thoroughly. The experiment itself only lasts about twenty minutes, with the remaining time taken up by discussion. I easily have run this experiment by hand with a class of 35

[3]There is nothing about this experiment which limits it to use with upper division students. Denise Hazlett has used this experiment in a principles course at Whitman College with no problems.

students, and see no reason why it could not be used with larger groups.

Each student is given a set of instructions (Appendix A) and five sheets of data. These are read out loud, and any questions are answered. The instructions tell the students that they are being given the answers for 150 question true/false exams from five different professors. The students are told that the professors seek to avoid any patterns in the answers, and that only one professor does so successfully. They are asked to pick out which professor is truly random (rather than having patterns in his/her answers).[4] Any student who answers correctly is paid a prize of one dollar.[5] Students are also asked to describe what methods they used in making their choice.

Appendix A includes the first sheet of data given to students. The process by which I generated the data works as follows. For each of the professors I assign a probability of a repeat, p^R. The answer to the first question is generated by a 50/50 distribution. Answers for the remaining questions are generated sequentially. The answer for period t equals the answer for period t - 1 with probability p^R, and equals the other answer with probability $1 - p^R$. For example, suppose $p^R = .75$. If the answer in period 19 is "true," the probability that the answer in period 20 is "true" is .75, and the probability that the answer in period 20 is "false" is .25. If $p^R = .5$, answers are uncorrelated over time. If $p^R > .5$, there is positive autocorrelation, and if $p^R < .5$ there is negative autocorrelation. The values of p^R are reported below in Table 1. These values were chosen to give one professor with strong positive autocorrelation (Alice), one with weak positive autocorrelation (Emma), one with zero autocorrelation (Bob), one with weak negative autocorrelation (Cindy), and one with strong negative autocorrelation (Donald).

Table 1
Probabilities Used to Generate Data

Professor	Probability of Repeat
Alice	.8
Bob	.5
Cindy	.4
Donald	.2
Emma	.6

Summary statistics for the data generated by this random process are given in Table 2. The overall probability of a "true" was indistinguishable from .5 for all five professors.[6] As expected, the realized probability of a repeat is closest to .5 for Bob. (For all of the professors other than Bob, we can reject the null hypothesis that $p^R = .5$. I don't usually bring this up with my students since it just confuses them.)

[4] In previous versions of this experiment, the problem was presented in the context of five statistics students being asked to generate random data for a class. The switch in context was intended to make the experiment more natural for students. This mainly comes into play for the follow-up discussion; the actual data does not differ strikingly between classes that used the statistics context and classes that used the T/F context.

[5] I have never had to pay out more than five dollars on this experiment, which strikes me as a low cost for a successful class. While it isn't necessary to pay students cash, I do think it is important to offer some sort of positive incentives (such as bonus points) for getting a right answer. This experiment plays a central role in my attempt to persuade students that people have difficulty recognizing random sequences (and that this can explain skepticism about the efficient market hypothesis). Without any incentives to get a correct answer, it is difficult to get students to take the experiment (and the following discussion) seriously, and difficult to defend the robustness of the experimental results.

[6] Students are told that all five professors generated 50/50 distributions. Without these instructions, large numbers of students calculate which sample is closest to 50/50 without looking at patterns over time.

Table 2 Summary Statistics for Experimental Data					
	Alice	Bob	Cindy	Donald	Emma
Probability "True"	.55	.49	.53	.51	.49
Standard Deviations from .5	1.31	-0.16	0.82	0.33	-0.16
Probability Repeat	.78	.54	.38	.17	.60
Standard Deviations from .5	6.80	1.07	-3.03	-8.11	2.38

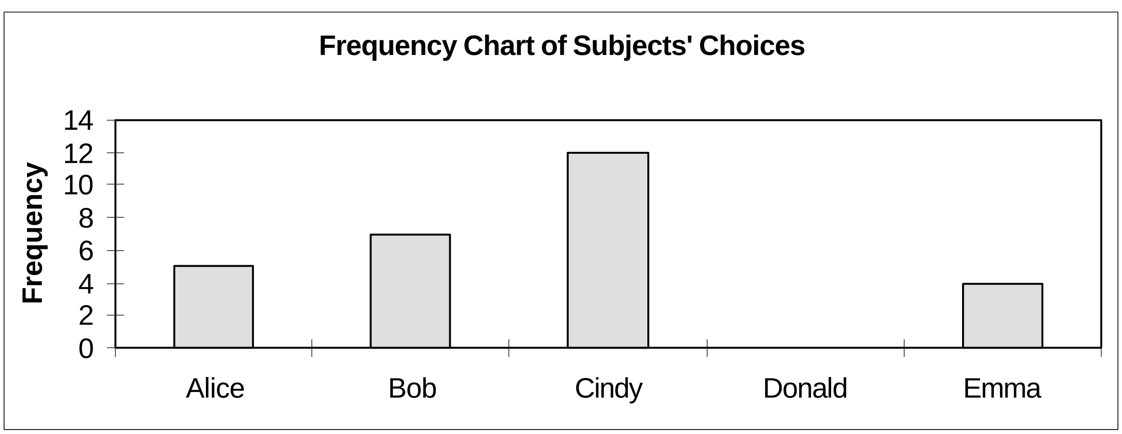
III. Experimental Results and Follow-up Activities: Given results in the cognitive psychology literature, we expect students to be biased in favor of random sequences with a slight negative correlation over time. Consistent with this, Cindy has been the modal choice in both sessions of this experiment I have run, as well as a session run by Denise Hazlett. The distribution of choices from the first session I ran and the session ran by Denise Hazlett are summarized by Figure 1. Unfortunately, I did not keep the data from the second session I ran, the only session which used the true/false exam context (I did not expect to be writing up this experiment). The results for this session were similar to those shown here. In particular, Cindy was the modal choice by a wide margin. In general, the bias towards slight negative autocorrelation is sufficiently strong that only small classes should run any danger of Bob being the modal choice.

After the experiment is done, I read off all the choices (anonymously) to the students and graph them. I then ask hypothetically if there is anyone who would like to change his/her choice. Usually a few students will want to switch to a more popular choice. This makes a nice example of how information is transmitted through observable actions. Next I announce the winning choice. Winners are paid off at the end of class.

The first thing I do in the follow-up discussion is reassure the students who did not pick Bob that they aren't stupid, and that most people choose the wrong professor. We then discuss how the students chose one particular professor. The following are some typical answers. The first two students chose Cindy and the third chose Bob:

"Cindy's pattern seemed to lack a pattern, it seemed the most random."

Figure 1



"Cindy appears to have the most random pattern."

"I initially searched for patterns with the data, then for unlikely results (large blocks of same results)."

In general, most students will look for the lack of an obvious pattern. Rarely, students will look at the patterns of runs. On very rare occasions a student will actually calculate some statistics. The main point I try to draw out is that students are seeing patterns in Bob's data where none actually exist.

I then introduce students to the hot hand fallacy by talking about the Gilovich *et al* article. Talking about this article generates lively classroom discussion because so many students are convinced there is a hot hand in basketball. More than anything else I talk about, this is the one issue students are willing to argue about with me. If you can convince a student who was certain the hot hand existed that it does not, you make it easier for that student to believe the efficient market hypothesis when he/she was certain that was wrong as well. If you persuade a student that the apparent basketball experts in the room are seeing patterns in shooting which aren't really there, it becomes easier to convince them that purported experts in finance might make the same mistake. Discussion of Gilovich *et al* usually takes more time than the rest of the discussion together.[7]

I also describe the gambler's fallacy to the students, and explain the connection between the hot hand fallacy and the gambler's fallacy. I illustrate the gambler's fallacy by outlining the lottery results of Clotfelter and Cook as well as relating some anecdotes about roulette players.

The final critical step of the follow-up discussion is to make the connection to financial markets. I always find something in a Wall Street Journal from the past few days to use as an example.[8] The chain of logic I want students to grasp is the following. The efficient market hypothesis implies that stock prices should be a random walk (with drift), exhibiting no pattern across time. Experts are convinced that this hypothesis is false, often times because they believe there are regular patterns in stock price changes. However, as we saw in the experiment, it is very difficult to tell when there are actually patterns across time in data. Experts often see patterns when none exist. Given the statistical evidence in favor of the efficient market hypothesis, it seems likely that financial experts are falling victim to the same misperceptions of random sequences that plague other experts. Thus, you should discount the opposition of many financial analysts as a good reason to not believe the efficient market hypothesis.

Following up this experiment should not be a one-day activity. Many students have trouble connecting the experiment with finance and can benefit from reinforcement of the connection. After the experiment is done, I have the students read Gilovich *et al*. I also assign some reading on the efficient market hypothesis; this includes a chapter

[7]In discussing this article, I make a conscious effort to include students who are not sports fans. I do this largely by contrasting the opinions of experts and non-experts. For example, I might ask a student who is not a basketball fan if they found the arguments made by the basketball junkies to be convincing. I then make the connection with the strongly held opinions of experts in the financial field.

[8]Analysts are constantly quoted talking about momentum in the markets, impending corrections, and other such nonsense. I ask the students if such a quote can be attributed to the gambler's fallacy or the hot hand fallacy. At least some students will quickly see the connection.

from the textbook as well as chapters 5 and 6 of *A Random Walk Down Wall Street* (Malkiel, 1990). Finally, I make a point of referring back to the experiment in later classroom discussions of articles from the Wall Street Journal.

IV. Feedback and Future Improvements: After the experiment is over, I give my students an anonymous feedback form. This allows me to see what the students have learned and find ways to improve the experiment.

The feedback form asks, "What was the main point of the exercise? What did you learn from participating and from the discussion?" Below are some typical answers. The first answer is what I'd like the students to learn. Answers like this are relatively uncommon. More common are answers like the second. Most students will learn that there are problems in people's ability to recognize truly random sequences. Relatively few make the connection with financial markets. In my experience, referring back to the experiment in later classes helps to make the connection clearer (although some students never make the connection).

"The main point of the exercise is that human beings tend to recognize a slightly negative correlation as random, but think that a true randomly generated result is slightly positively correlated. This result can be used to explain the reason behind the fact that people tend to think there is a pattern in stock price change[s]."

"To discern which set of flips was truly random (I got it right hah-hah). I learned that when looking for patterns, you will usually find them even if they aren't there."

I also ask the students a pair of questions designed to explore whether they felt the experiment was a good use of their time. Answers to these questions were overwhelmingly positive (84% positive). This is not definitive proof, since even with anonymous forms students may be worried about angering me. However, the high energy level in the classroom suggests that the students are interested by this experiment and the follow-up material.

If there is any problem with this activity, it is the disappointing percentage of students who are able to make a connection to financial markets. In the future, I plan to explore contexts that are closer to financial markets, such as having students distinguish real stock charts from fake stock charts. Along with improved discussions, this should help students understand that there exists a link between our perceptions of chance and our perceptions of financial markets.

I would like to thank Norm Camerer, Denise Hazlett, and the editors of Expernomics for their helpful comments. I would like to thank Ido Erev for his useful advice on the cognitive psychology literature. As per usual, any errors are solely my responsibility.

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Appendix A

Instructions: Many professors like to use true/false questions on their exams. The design of these exams raises an interesting problem. The professor would like to design the exam so there isn't an obvious pattern to the answers. Using either the current exam or past exams, the students would like to find patterns which will help them answer the questions. Thus the design of T/F exams creates a contest pitting the ability of professors to be random against the ability of students to recognize non-randomness.

In this experiment, you have been given the answers for 30 question T/F exams from five professors. One of these professors actually managed to be truly random, while all of the others have a predictable pattern to their answers. (All of the professors are good enough to manage a roughly 50/50 split between T and F answers. The differences are more subtle than this.) Your job is to identify who is truly random.

Please answer the following two questions. Write your name in the space below, detach this sheet, and fold it in half. Hand your sheet to the front of the class. After everyone has finished, I will be announcing the answer to question #1. Anyone who gets this question correct will receive $1. After recording who has correct answers, I will return your forms and we will discuss question #2.

Do not talk to any of the other students. Do not look at the answers of any other student. If I catch you looking on someone else's paper, or talking, you will not be eligible for any extra credit points for the remainder of the semester.

If you have any questions, please raise your hand.

Name__________________________

Question 1: Which professor made his/her answers truly random?

Question 2: Describe briefly what method you used in answering Question 1. Was there anything you would have done differently with more time and/or resources? (Assume you can't gather any additional information about the five professors.)

Appendix A (continued)

Question #	Alice	Bob	Cindy	Donald	Emma
1	False	False	True	True	False
2	False	False	False	False	False
3	False	False	True	True	False
4	False	False	False	False	True
5	False	True	False	True	True
6	True	False	False	True	False
7	True	False	True	False	True
8	True	False	True	False	True
9	True	False	False	True	False
10	True	True	False	False	False
11	True	True	True	True	True
12	True	True	True	False	False
13	False	False	True	True	True
14	False	False	True	False	True
15	True	False	True	True	False
16	True	True	False	True	False
17	False	False	True	False	True
18	False	False	True	False	True
19	False	False	False	True	False
20	False	True	True	True	False
21	False	True	True	False	True
22	False	True	True	True	False
23	False	True	False	False	False
24	True	True	True	True	False
25	True	False	True	True	False
26	True	False	False	False	True
27	True	True	True	True	False
28	True	False	True	False	True
29	False	True	False	True	True
30	False	True	False	True	True

The Savings/Consumption Game: An Update

*Jurgen Brauer**

A few years ago, I published a piece in this journal, entitled "A Savings/ Consumption Game for Introductory Macro-economics" (Brauer, 1994). Following a survey of available classroom games and participatory exercises, I found that most such games address issues of *micro*-economics, and I therefore set out to design an exercise of potential use in the teaching of introductory *macro*economics. The idea of the exercise is straightforward. Instead of merely *presenting* to students the graphical representation of the theoretical concept of a consumption function (C = a + bY, where C is consumption and Y is national income), why not simply collect data from the students themselves about how their own consumption (and savings) behavior might be affected if their own income were to change.

To collect the student data, I designed a simple form (see Appendix A, Income/ Expenditure Handout). This form can be handed out at the end of one class, collected during the next, and processed in time for your session on consumption, savings, investment, and export and import functions. Therefore, the class-time cost of data collection is essentially zero. I have collected data for eight classes (two each in the Winter quarters 1995, 1996, 1997, and 1998). Without exception I have received consistent results, and they are pedagogically highly valuable to my teaching. The major reason for this statement is that in explaining consumption functions, and how a consumption function becomes part of an aggregate expenditure function, and how the latter is turned into an aggregate demand curve can always be traced back to the *students' own data*. This makes for a powerfully consistent story line that the instructor can hold before the students' eyes over the course of a week or two of lecturing on the construction of the aggregate demand curve. This technique of collecting data from students and constantly and consistently *using* or *referring to* their own data captures and holds students attention focused on the complex material to be developed.

Table 1 hereunder presents data from a recent class. In this case, I had data from 21 students (but I present data for only eight students). The reason for having students fill in the full form (Appendix A) is simply that I do not want them to guess that my real interest is not in the distribution of income among various expenditure categories, but merely in the distribution of income between savings and consumption. On a computer spreadsheet, I merely enter the data from the savings line. Since consumption is the difference between income and savings, it is very easy to have a spreadsheet compute the consumption rate, savings rate, and marginal propensities to consume and save out of additional income. If desired, the instructor can later supplement the cross-sectional data from the students with time-series income and consumption data from, e.g., the *Economic Report of the President* or similar data sources, as some textbooks do (e.g., McEachern, 1997, p. 184; Stiglitz, 1993, p. 768).

The computations carried out in Table 1 are, in practice, often difficult for students to follow and to comprehend. Using the students' own data, reflecting their own behavior, makes it easier for them to follow the discussion and rationale of constructing a consumption and savings function. Moreover, using the students' data furnishes a wonderful opportunity to point

Table 1: Consumption/Savings Data					
Student	**$1,250.00**	**$1,500.00**	**$1,750.00**	**$2,000.00**	**$2,250.00**
1	$0.00	$50.00	($50.00)	($50.00)	$50.00
2	$100.00	$150.00	$100.00	$100.00	$100.00
3	$500.00	$625.00	$700.00	$875.00	$1,025.00
4	$125.00	$150.00	$175.00	$200.00	$225.00
5	$390.00	$520.00	$790.00	$920.00	$870.00
6	$70.00	$100.00	$150.00	$200.00	$250.00
7	$50.00	$100.00	$0.00	$50.00	$0.00
21	$200.00	$450.00	$450.00	$550.00	$550.00
Average S	$146.67	$250.71	$311.90	$373.33	$442.62
Proportion of DI	0.12	0.17	0.18	0.19	0.20
Change in S		$104.05	$61.19	$61.43	$69.29
Average C	$1,103.33	$1,249.29	$1,438.10	$1,626.67	$1,807.38
Proportion of DI	0.88	0.83	0.82	0.81	0.80
Change in C		$145.95	$188.81	$188.57	$180.71
Check: S+C=DI	$1,250.00	$1,500.00	$1,750.00	$2,000.00	$2,250.00
Sum proportions=1	1.00	1.00	1.00	1.00	1.00
Change in DI		$250.00	$250.00	$250.00	$250.00
MPS=chgS/chgDI		0.42	0.24	0.25	0.28
MPC=chgC/chgDI		0.58	0.76	0.75	0.72
Check:MPS+MPC=1		1.00	1.00	1.00	1.00

out that even though *individual* economic behavior differs (as microeconomics teaches), it nonetheless aggregates into highly predictable *macro*economic behavior. For example, in Table 1, the savings of student #1 *fall* as income is presumed to rise from $1,500 to $1,750. It is important to stress to students that this individual behavior is just fine and is not an anomaly at all. Macroeconomists do not need to make data conform to expectations; we just take the data the way they come, and still find that some behavior is highly predictable in the aggregate: in this case, the consumption function is definitely upward-sloping (see Figure 1).

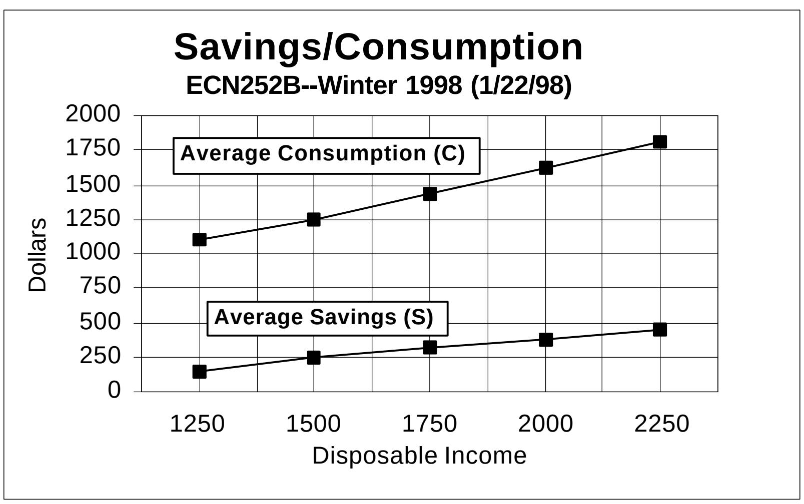

Figure 1

On the basis of such data, it is now relatively easy to get students to think about *shifts* in the consumption (and savings) function, depending on external events such as changing expectations, interest-rate changes, wealth-effects, and the like. Because each student filled in his or her own data sheet, it is easy to get them to see and acknowledge that, yes, their *own* consumption and savings behavior might change with changing economic circumstances (other than income, that is). If true for them, then surely also for others, and therefore for the aggregate.

An additional wrinkle is introduced by noting, in Table 2, that data from my morning classes show mostly *lower* marginal propensities to consume (MPCs) than my evening classes. Most likely the reason is that the morning classes are predominantly populated by younger students without family commitment, whereas the evening classes (in the 5:30 p.m. to 10:00 p.m. time slots) are frequented by students who are more likely to hold regular full-time jobs, have their own family, and are much more money and family-budget conscious than their morning-class counterparts.

Table 2: Comparing MPCs Across Classes

Income	$1,250	$1,500	$1,750	$2,000	$2,250
Class 1 (M)	n/a	0.42	0.61	0.72	0.47
Class 2 (E)	n/a	0.75	0.81	0.71	0.77
Class 3 (M)	n/a	0.61	0.68	0.67	0.45
Class 4 (E)	n/a	0.76	0.44	0.81	0.61
Class 5 (M)	n/a	0.56	0.53	0.68	0.49
Class 6 (E)	n/a	0.42	0.69	0.48	0.49
Class 7 (M)	n/a	0.57	0.56	0.52	0.42
Class 8 (E)	n/a	0.58	0.76	0.75	0.72

Depending on your own inclinations, teaching objectives, and students' background, note that the collected data permits you to estimate a regression line through the data. For example, for class 8 the estimated line would be C = 195 + (0.71)(DI), where DI refers to the disposable monthly income of Appendix A, and the estimated average MPC is 0.71. You could rescale Figure 1 to show a zero on the horizontal axis, and trace the consumption function all the way back to DI = 0. From there on, it is pretty straightforward to explain to students how the *graphical* representation of the consumption function is translated into its *algebraic* equivalent (with intercept and slope) and that, in turn, can later on be used to construct a macroeconomic system of equations of which the consumption function is but one equation.

Again, the pedagogical point is that all of this either is developed purely "in the abstract," because the textbook says so, or with the aid of student-derived data--which will increase students' absorption of the material and foster their interest in the matters developed in (and beyond) class.

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APPENDIX A **INCOME/EXPENDITURE HANDOUT**

Consider only income column 1 (labeled Col 1--$1,250). Suppose that $1,250 is your monthly net income, that it has been so for some time, and that you expect that you will continue to receive it for some time. How would you use your money?

When finished with column 1, repeat the exercise for the other columns, always under the assumption that you are receiving the indicated monthly income, have been receiving it for some time, and expect to receive it for some months to come. When finished with all columns, hand the sheet to your instructor.

DISPOSABLE MONTHLY INCOME (i.e., after taxes and transfer payments)	Col 1 $1250	Col 2 $1500	Col 3 $1750	Col 4 $2000
MONTHLY EXPENDITURES				
• Food/household (e.g., dishwasher liquid, etc.)	_____	_____	_____	_____
• Housing (e.g., rent, mortgage pymts, repairs)	_____	_____	_____	_____
• Transportation (e.g., gas, car repairs, bus fares)	_____	_____	_____	_____
• Medical (e.g., insurance premium)	_____	_____	_____	_____
• Entertainment/recreation (e.g., eating out)	_____	_____	_____	_____
• Other ordinary expenses	_____	_____	_____	_____
• Savings/personal investments	_____	_____	_____	_____
TOTAL EXPENDITURES	$1250	$1500	$1750	$2000
AVAILABLE SAVINGS	$4500	$5000	$5500	$6000

NOTE: If you find that you cannot cover your ordinary expenses out of your monthly income, you may deplete some of your savings. For example, you would write -$50 into the savings line when you withdraw from savings and +$50 when you deposit some of your income into savings.