Moving Past Rats: More Economists Study Behavior in Online Experiments

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When 10 homes and nine lots in the Palm Springs, Calif., Bermuda Dunes development project sold in one hour and 29 minutes, the event was heralded as one of the highest-value Internet auctions to date.

What the bidders -- and even the developer, real-estate giant Kaufman & Broad Home Corp. -- didn't know, is that the July auction was in fact a "field test of theories and models that were actually developed in the laboratory," according to Charles Plott, professor of experimental economics at California Institute of Technology in Pasadena, Calif.

Dr. Plott, the "architect" of the auction, will use the data from bidders' behavior to refine and test more sophisticated versions. "A research paper will come out of this," he notes.

For years, experimental economists like Dr. Plott have been relegated to the sidelines of academia, studying markets and economic theories in the lab. But in just the past two years, half of the top 10 U.S. business schools as well as numerous university economics departments have hired experimental economists. The discipline has started publishing its own journal, and the number of scholarly treatises

published on the subject skyrocketed to 232 in 1999 from an average of fewer than 20 per year in the 1970s.

Businesses and government bodies are getting involved. Hewlett-Packard Co. and International Business Machines Corp. have opened experimental-economics labs, and the Federal Communications Commission consults experimental economists for advice on running its online auctions of airwaves for wireless services. There is even buzz in economist circles about an experimentalist winning the Nobel Prize.

That's a far cry from the 1970s, when John Kagel, an economics professor who is now at Ohio State University, started using rats in his experiments to test various economic theories. One experiment aimed to dispute the long-held notion that the poor are mired in a "cycle of poverty" because they save a smaller proportion of their income than the rich do.

His experiment involved two groups of rats. One group was given four times the amount of water, and twice as much food, as the other, creating a fat (rich) group and a thin and hungry (poor) group. Both groups were then trained to associate behavior at their regular feedings with amounts of food received: When presented with food, they could either consume it immediately -- "spending their capital" -- or wait an interval and receive a greater amount -- "principle plus interest" -- later.

"The rats who were wealthy, or fatter, went for the smaller, more immediate reward more often than the rats who were poor, or leaner," Dr. Kagel says. He admits that extrapolating such results to humans from rats raises the same doubts that similar experiments in medicine and psychology do. But he believes his experiment contradicts the notion that the rich are instinctively better savers and speaks to assumptions about poor humans, namely that "it ain't that they've got screwed-up preferences -- it's that they get screwed all the time."

Early in their struggle for recognition, experimental economists were

criticized for being unable to demonstrate the usefulness of their results. Today, Internet commerce has helped them over that hurdle. Harvard University recently appointed Alvin Roth to serve as an experimentalist liaison between the business school and the economics department. Dr. Roth and a colleague, Axel Ockenfels, have found that subtle differences in the rules of an auction -- say, in how it is concluded -- can profoundly affect bidder behavior. For example, Internet auctioneers eBay Inc. and Amazon.com Inc. both stipulate the date and time a given sale will conclude, but Amazon has an added wrinkle: Whenever a bid is cast in the 10-minute interval before the Amazon auction is scheduled to end, the auction is automatically extended for an additional 10 minutes from the time of the latest bid. This ensures that an Amazon auction can't close until 10 "bidless" minutes have passed.

At eBay, by comparison, potential buyers will often step in at the last minute, sparking bidding frenzies. Is this simply because these late bidders have been holding out to avoid driving up the price early on, as might be expected? Dr. Roth, who consults for Web companies, believes that to be the case but can't rule out other variables. To better understand the two groups' behavior, he plans to run experiments with people in a laboratory.

"We're starting to see the birth of a kind of engineering economics," Dr. Roth says of his work. "Having a proliferation of markets on the Web is great for economics because even markets we don't build we can study."

Two years ago IBM hired an experimentalist from Hewlett-Packard's laboratory in Palo Alto, Calif., and last November quietly opened its own lab at its research center in Yorktown Heights, N.Y. Both companies have developed proprietary software and use human subjects -- sometimes managers -- to simulate market environments.

Kay-Yut Chen, a project scientist at Hewlett-Packard, says the lab allows him to test changes in corporate policy to examine the effect on

market structures before the change is introduced. IBM's senior manager of research, Robert Baseman, says the company will use its lab to focus on helping customers build and design markets on the Internet.

"Before we came along, you had 10 executives who would sit around and use intuition and reasoning" to make decisions about contracts and advertising, Mr. Chen says. Using labs can save time and money, he adds.

Some of the economists' experiments take on the guise of games. Vernon Smith, a professor at the University of Arizona, is asking human subjects in a "voluntary trust" game to chose from the following:

1) You are Person A. You will be given $40, which you must split evenly with another subject in the experiment -- Person B -- in which case the game is over.

or

2) You, Person A, present Person B with two choices, involving different sums: You tell Person B he can take $30 out of $45, leaving you $15; or he can split $50 evenly between the two of you.

To complete the math, you, as person A, have a sure $20 if you choose the first alternative; if you go for the second, you will be left with either $15 or $25, depending on Person B's decision.

The stakes may seem small, but the implications of the choice are enormous, says Dr. Smith.

If you choose No. 1, you fit the "rational" (read money-hungry) model that classic economists have traditionally used to predict human behavior. But Dr. Smith is finding that a majority of people choose No. 2 -- with good reason, as it turns out, because most of the people in the role of Person B generously decide to split $50 evenly instead of taking

$30.

What gives? Respect and reciprocation, Dr. Smith says. The second person in the experiment knows you deferred the decision to him, thereby giving him a chance to make more money. He returns the favor by settling for a little less, leaving you with more.

"The standard economic model is one where we're very self-interested," Dr. Smith says. But, he adds, even among strangers, "the people who are trusting make more money than those who are not."

Dr. Smith and a colleague, Kevin McCabe, also study magnetic-resonance imaging scans of people playing this voluntary-trust game online. By monitoring blood flow to regions of the brain, they hope to build a physiological model of how economic decisions are made.

IBM invited Dr. Smith to speak at the dedication of its experimental lab. The professor didn't mention his brain-scanning experiments but says he has thought a lot about the connection between the trust games and IBM's objectives.

The idea of "people interacting in anonymous situations is very relevant to e-commerce and the Internet," he says. "It's a whole new world out there among anonymous agents, and we need new institutions that will allow them to build reputations, so that people can trade on trust."