

Experimental Economics (and bounded rationality)

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Lecture 1

Procedures

- We will have experiments in class (during “lectures”)
- You will have to read *real* research papers and present them in seminars
- There will be a serious research project (team work possible) worth 40% of grade
 - Start thinking about it! (might save your life, it saved mine)
- Final exam worth 60% of grade
- I will be posting material on my website (more control, easier to do stuff than with moodle)

Who is this course for?

- Academic Types, Intellectually Curious People, Consultants Who Want to Do Serious Work, Future Presidents of the United Federated States of Micronesia
- Tips
 - Take Game Theory (very very very strongly advised) and Industrial (advised)
 - Work every week for this course
 - this is not a “one-week-before-final-exam-studying” thing
 - It will be tough but fair
 - Have fun.
 - If you don't like the subject, you won't even pass.
 - If you like it, you will get first class, useful knowledge for the rest of your life and a pat on the back (this last thing might be illegal, have to check with the admin people)

When to meet

- Timetable?
- Warning: Lectures might sometimes take a bit more than an hour since experiments are unpredictable
- Warning 2: One day break between lecture and seminar useful, to prepare presentations etc

A bit of history

- “One possible way of figuring out economic laws is by controlled experiments. ... Economists ... **unfortunately cannot perform controlled experiments.**” (Samuelson/Nordhaus, 1985)
- Experimental economics is an “**exciting new development**” (Samuelson/Nordhaus, 1992)
- The first economics experiment was actually done in 1948 already
- Established field by now – Dozens of labs - Experimental conferences with hundreds of papers
- We got our first Nobel prize in 2002 (V.Smith – D.Kahneman)
- Doubled it with E. Ostrom (2010)
- R.Selten (1994) got a Nobel prize for game *theory*, but he’s an experimentalist at heart

What makes an experiment

- Participants make economic decisions in a simplified, controlled environment which can be replicated
 - i's actions influence j's payoffs => game theory
 - No effect => decision theory
- Example: a buyer and a seller bargain for the price of some good, the seller incurs costs, the buyer has got some value from buying the good
- There are real monetary incentives, that is, subjects are paid according to their profit. This was not necessarily the case in early experiments (e.g. Smith 1962) and is in contrast to common practice in psychology (but psychologists cheat, deceive and are weird anyway)

- **Instructions** carefully explain the experiment and give all the relevant information; they never (well, almost never) state an objective of the study or any expectations on participants behaviour!
- However, participants are not deceived with respect to the procedures and payoffs in the experiment. Again, this is in contrast to much of psychology.
- **Treatments** differ by the crucial variable (e.g. trading rule, or cost parameters). Hence its impact is assessed by comparing the relevant treatments.
- **Areas** in economics where experiments are used: market experiments and auctions, macroeconomics, financial markets, political economy and voting, cooperation and public goods, game theory, learning models, fairness and altruism, individual decision making

Why experiments

- Is playing with students in a lab representative of what happens in the real world?
- Experiments allow us to test **fundamental assumptions** of economic theory concerning human behavior, e.g. rationality
- Experiments are the basis for **behavioural economics** which aims at improving the predictive power of economics models by integrating systematic deviations from the standard predictions
 - The results may test the robustness of (game/decision) theory or even help refining it
 - This is easier in the laboratory because all other factors can be controlled

Why experiments, pt 2

- Experiments also useful to analyze carefully what happens in real world situations and how our big complex models fit real behavior
 - whenever field data are not easily available or of low quality
 - “experimental evidence is better than no evidence”
- To test new mechanisms
 - Is it a good idea to change retirement rules, tax rates, bank regulations in the whole economy before running some controlled tests?
- Educational: as an illustration of the relevance of economics concepts

Controlling preferences

- Think of an auction in the lab. How do you make people care about what you are selling?
- In most experiments the researcher would like to have control over subjects' preferences. The aim is that subjects' behaviour is driven by the induced preferences.
- An Illustration
 - Subjects can get red and blue slips of paper. x : number of slips of red paper; y : number of slips of blue paper)
 - Experimenter wants to induce the utility function $U(x,y)$
 - for instance $U(x,y) = x^2y^3$
 - The experimenter pays subjects according to the final holdings of red and blue paper slips. The monetary payoff function $R(x,y)$ is identical to the utility function $U(x,y)$.
- This induces the utility function U

Controlling Preferences, pt. 2

- Induced Value Theory, Smith AER 1976
 - Use of money as a reward medium:
 - Δm denotes the subject's money earnings resulting from her actions in the experiment. m_0 represents a subject's "outside" money.
 - Total money holdings are $m = (m_0 + \Delta m)$.
 - Subject has unobservable preference
 - $V(m_0 + \Delta m, z)$
 - z represents all other motives.
- Assumptions
 - Monotonicity: dV/dm is positive for every (m, z) combination
 - Dominance: ΔV from experiment are predominantly from reward medium and other influences are negligible
 - Salience: reward Δm depends on own and others action.

The auction example

- Electronic markets where we sell a virtual good to the subjects and want to see how they bid (bid function)
 - For a bid function you need values (x axis) and bids (y axis)
 - How to control values?
- Suppose you want to induce symmetric independent private values $U \sim [0,100]$
 - Means the good can be worth any value from 0 to 100 with the same probability
- We give subjects an endowment of money
- If you win the good you can “resell” it to the experimenter
- The money he will pay you is your “private value”
 - PV announced before each bidding round