Behavioral Economics

Lecture 1. Introduction and the Methodology of Experimental Economics

1. Introduction

Characteristica of Behavioral Economics (BE)

Unlike standard economics, BE is (most of the time) not based on first principles, but on observed behavior of real people.

Observed behavior does not confirm standard theory.

Observation of behavior:

anecdotal evidence, introspection
psychology
most important: experimental economics (EE)

$\implies$ BE and EE closely interlinked - EE part of BE (?)

Reasons why behavior contradicts standard theory:

agents are motivated differently: non-egoistic preferences
agents are less rational as assumed

Structure of the course:

Lecture 1: The Methodology of EE

Lecture 2 - 6: Non-egoistic Preferences

Lecture 2: Distributional Concerns

Lecture 3: Other Regarding Preferences in General Equilibrium

Lecture 4: Reciprocity and the Impact of Beliefs

Lecture 5: The Impact of Beliefs on Payoffs - Psychological Game Theory

Lecture 6: The Indirect Evolutionary Approach and the Endowment Effect

Lecture 7-9: Bounded Rationality

Lecture 7: Non-equilibrium Strategic Thinking

Lecture 8: Learning Models

Lecture 9: Experimental Comparisons of the Learning Models

Lecture 10: Market Experiments and Competition between Trading Institutions

Lecture 11: Learning and the Creation of Trading Platforms

Lecture 12: The Emergence of Trading Institutions

Choice of topics highly subjective; e.g. does not include behavioral finance, choice under risk and uncertainty

2. The Methodology of Experimental Economics

2.1. The Basic Principles of EE

EE: Observation behavior of real people (subjects, participants) in designed and controlled, but nonetheless real economic situations.

Purposes

Test of theories

Generating 'stylized facts' to develop better theories

Advantages of EE

Design of the economic situation by the experimenter $\implies$ 'right' data generated, no proxies needed

Control of the economic situation by the experimenter $\implies$ ceteris paribus assumption holds, single causal relationship can be isolated

Well documented exps can be repeated by other researchers; also test of robustness of results possible

Disadvantage: Problems with external validity, because

Subject pool not representative

Subjects not acquainted with experiments

Payments lower than in real world

only basic "modes of behavior" can be subject of experimentation

only qualitative aspects of results reliable

2.2. Testing of Theories

Theory: $A \implies B$

Examples for A: Assumptions about preferences, production technologies, strategy sets, payoff-functions etc.

Experimental test of a theory: Conditions, that are consistent with A, are created. Then observation, whether prediction (i.e. B) holds.

Well suited: microeconomic models, since they make predictions about individual behavior.

Problem: How to guarantee, that preferences of subjects fulfill A? How to control for preferences?

Solution: Money used to induce 'right' preferences.

Induced Value Theory (Smith 1976):

Assume that a person is in a situation, where she can make money. If her preferences are strictly monotone in her own monetary payments, and she is only interested in her own payments (egoistic preferences), then the payments represent her preferences over the outcomes

$\implies$ the monetary payments induce the preferences over the outcomes.

$\implies$ induced preferences can be controlled for, since payment-functions are given by the experimenter.

If behavior under risk also satisfies v.N.M. Axioms, monetary payments induce v.N.M. preferences.

To get theoretical prediction, one needs not only assumptions (A), but also a 'solution concept' like Nash E., subgame perfect E., Walrasian (market clearing) E.

$\implies$ only joint test about the solution concept and Induced Value Theory possible

$\implies$ two potential reasons for an experimental falsification (B not observed) of a theory

a) The solution concept does not work:

Human beings are less rational than required by theory (especially game theory) $\implies$ Theories of 'Bounded Rationality', Learning Theories, Evolutionary Theories

Coordination problems: Subjects cannot coordinate their strategies on one Nash E; non-market clearing prices are offered.

b) Preferences are not consistent with Induced Value Theory:

Payment differences are so small that subjects do not care $\implies$ flaw in design (normally not a problem)
Subjects are not egoistic, but envious, altruistic, fair, reciprocal, etc $\implies$ theories of fairness, reciprocity etc.
Behavior under risk is not consistent with v.N.M: Axioms $\implies$ Non-expected Utility Theory.

a) and b) often mixed up: Non-selfishness called 'Irrationality' etc.

Strictly speaking, a) and b) cannot be disentangled. Hence, for many experimental results both explanations found in literature. However:

The simpler the experiment, the less plausible is explanation a).
The less information about other subjects payments available, the less plausible are fairness, envy etc. explanations (but information about others payments also determines game theoretic prediction!).

2.3. Generating 'stylized facts'

Example: Emergence of Market Institutions (Lecture 12)

Weaker connection to theory

However:

always a-priori ideas, why some questions are interesting $\implies$ experiments without any 'theory' is impossible

falsifying existing theories generates often also 'stylized facts' $\implies$ strict distinction between the different types of experiments often impossible.

3. The Design of an Economic Experiment

3.1. Derivation of testable hypotheses

Starting from a theory or at least some vague ideas, one has to derive few, precisely formulated hypotheses.

In reality, many different causal relationships work at the same time. Separate them and investigate them in different experiments.

Do not attempt to mimic reality in the lab!

3.2. The structure of the experiment

design of the E such that only very few explanations for the results are possible

keep the game as simple as possible; as few subjects as possible, as few strategies as possible - Do not attempt to mimic reality in the lab!

Anonymity: Decisions of and payment to the subjects should remain anonymous.
Otherwise: group pressure, repeated interaction in 'normal life $\implies$ loss of control by the experimenter.

Strategy Method? Not only actions, but full strategies chosen by subjects. Advantage: data contain more information. Disadvantage: SM itself may have impact on choices.

3.3. Repetitions

To allow for learning: same subjects play the same 'game' more than once

Problems:

'Repeated Game Effects': Even rational and egoistic players play differently, if a game is often repeated with the same players $\implies$

either all the repetitions together are treated as one observation,

or repetition with different partners ('Strangers Treatment')

Independence of observations: repetition with different partners decreases the number of independent observations.

3.4. Choice of the payment-function

Three criteria:

Function such, that expected payments are at least as large as the wage rate subjects can get outside the lab

Different decisions should have an non-negligible impact on the payments.

Differences in the predictions of hypothesis and counterhypothesis should be as large as possible.

3.5. Instructions

To allow for replications by other researchers: subjects must be able to understand the experiment just by reading the instructions (without additional verbal explanations of the experimenter)

$\implies$ Instructions have to be complete, simple, and clear.

Misleading or value-loaded words and phrases must be avoided as much as possible.

Do not lie: Instructions have to be truthful. Otherwise: Negative externalities on future experiments and other experimentalists.

Control questionnaires to test whether the instructions have been understood. It forces subjects too think about the game before the beginning of the experiment.

Ex-post questionnaire: Optional; can provide useful hints for the interpretation of the results.

3.6. Other practicalities

Purpose of the experiment must not be announced

Own students should not be subjects

No subject should participate more than once in the same experiment

Trial experiment: Test,
whether design works
whether actual payments are neither too small nor too large
whether subjects understand instructions
etc.

During exp, any communication between the subjects has to be prevented.

Statistical analysis: (lack of) independence the individual observations
taken into account

Nonparametric statistics often useful.