Experimental Economics as Part of Economic Science

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- Preliminary Question in some People's Minds:

  Can We Do Experiments in Economics???

Answer: **YES, WE CAN!**

- AND: It has also been recognized by economics at large.

Nobel Prize in Economics, 2002 went to Daniel Kahneman and Vernon Smith

The Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel 2002

- **Vernon Smith**: “for the use of laboratory experiments as a tool in empirical economic analysis, in particular, for the study of different market mechanisms”.

- **Daniel Kahneman**: “for the introduction of insights from psychological research into economics, in particular with regard to judgements and decisions under uncertainty”. Kahneman’s research is based on psychological experiments and questionnaires.

AND: Reinhard Selten received The Bank of Sweden Prize in 1994 (with Harsanyi and Nash)

- **The Prize was awarded for their pioneering analysis of equilibria in the theory of non-cooperative games.**
- **However, Selten had also done pioneering work in experimental economics.**

- One has to see experiments as one more way of helping us to understand economic and social issues.

- Understanding these issues is not easy and to have one more instrument will surely help.

- The real issue is to do experiments well.
- One needs to think about what interesting issues are.
- Plan the experiments well.
- Execute them well and analyze the results.
- One needs to have some infra-structure: lab, programer…

Different types of experiments

- There are:

  - “Natural” experiments.

  - Laboratory Experiments.

  - Field Experiments.

How does a *laboratory* experiment work?

- A group of volunteer participants.
- They get instructions about what they can do in an experiment and how their decisions lead to different payoffs.
- They make decisions freely.
- The experimenters look at the decisions and use them to study the issue they are interested in.

- The two key advantages of laboratory experiments is to observe people's behavior under conditions of:
  - Control
  - Replicability

Some issues of control

- Subjects are randomly assigned to the treatment conditions – rules out selection bias.
- It is known which variables are exogenous and which are endogenous – allows to make causal inferences.
- Experimenter can make *ceteris paribus* changes in the exogenous variables – allows for the isolation of true causes.
- Many variables that cannot be directly observed in the field can be observed in the lab. For example, communication.

Most important objection: How about the artificiality of the situation?

- It’s an important concern.
- One should deal with it rationally.
- Interesting new reference:

  Armin Falk and James J. Heckman (2009), “Lab Experiments Are a Major Source of Knowledge in the Social Sciences”, *Science* 326, 535-538.

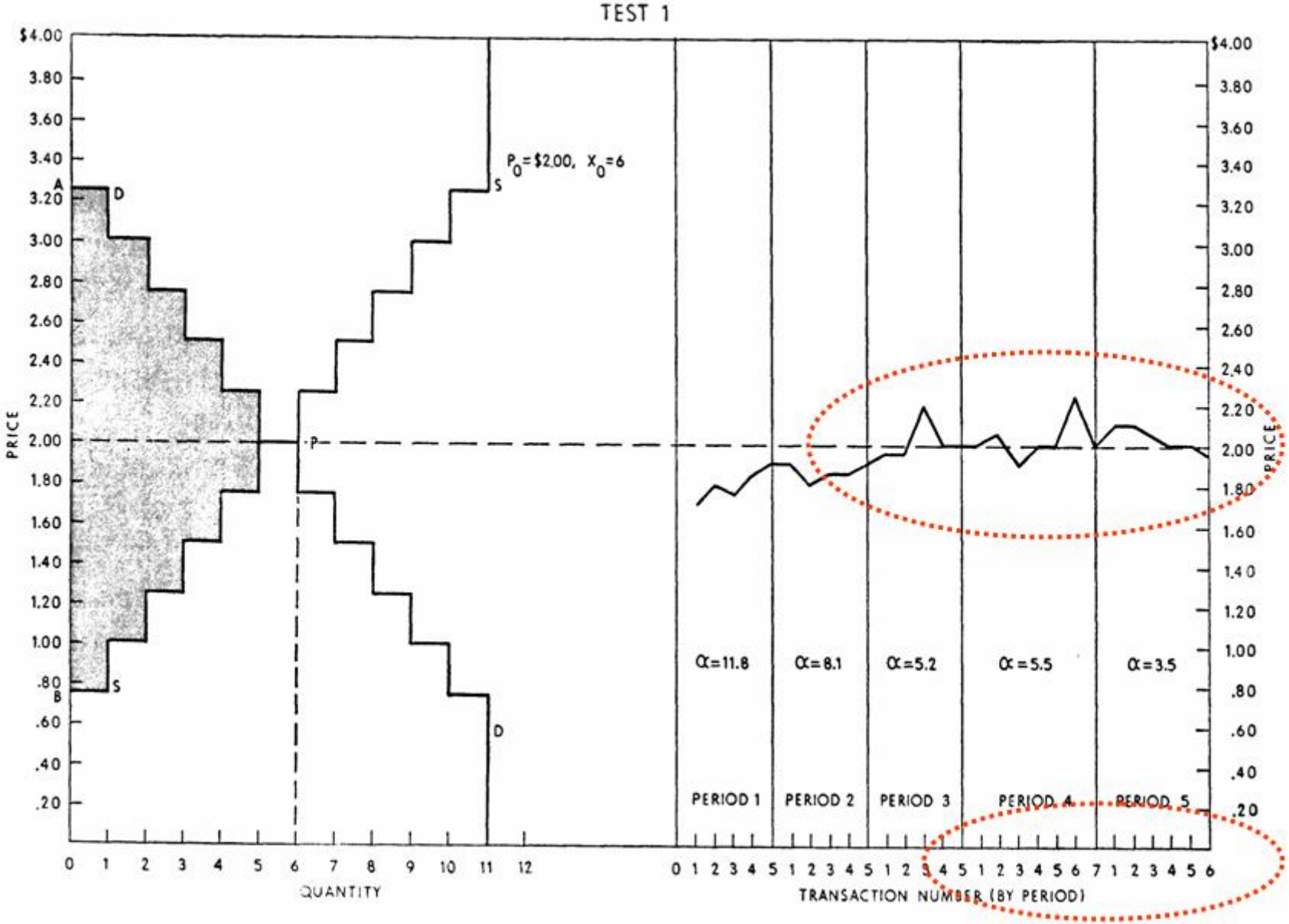
Falk and Heckman's main points:

- Controlled variation is the foundation of empirical scientific knowledge.
- Participants in the lab are human beings, who perceive their behavior as relevant, experience real emotions and make decisions with real economic consequences.
- Lab or Field is not the Choice. "Realism". "The real issue is determining the best way to isolate the causal effect of interest". Another way of putting it: the issue is "portability".

What are some areas where experiments have made important contributions?

- The analysis and design of markets.
- The analysis of preferences:
  - Sociality.
  - Decisions under uncertainty.
- The analysis of boundedly-rational decision-making.

CHART 1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PRICE
QUANTITY
TRANSACTION NUMBER (BY PERIOD)
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α=8.1
α=5.2
α=5.5
α=3.5
PERIOD 1
PERIOD 2
PERIOD 3
PERIOD 4
PERIOD 5

- Smith’s findings:
  - A certain kind of market institution will lead to an efficient outcome.
  - Established a method for studying markets, which can be used for other market institutions.

Experiments and Theory

- Types of models that have emerged as reactions to experimental data:
  - Social preferences.
  - Learning models.
  - New models of behavior under uncertainty.
  - Quantal-response model.
  - K-level models of initial behavior in games.

- Two remarks:
  - Experiments have allowed for a quick back-and-forth between data-gathering and model-formulation.
  - Many experimental results can no be captured by simple parsimonious models.

What are some more recent developments?

- Field Experiments or Interventions. Recent example: Bloom et al. (2010) on Management in India.
- Neuroeconomics and Other Techniques for studying Physiological Aspects of Decision-Making.
- The Link to Other Disciplines like Psychology and Sociology.
- The Link to Social Simulations with Artificial Agents.

Final remarks

- Doing economic experiments is very exciting. They lead to many unexpected discoveries.
- Many things can be done with experiments. Just, do them carefully.
- Conventions about what can and can not be done should be challenged. For example, macro-economics.
- Experiments and theory are very complementary.