Selected Readings in Micro: Session 1

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Agenda

- Course Overview
- Bounded Rationality in IO: Ellison (2006)

Course Description

- read papers together on several micro topics, related to IO
  - bounded rationality
  - business-to-business relationship
  - dynamic models of industry
  - auction models
  - antitrust economics
  - other topics TBD (need your input!)

Requirements

- attend class and read papers (15%)
- two reading summaries (35%)
- two presentations (50%)

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- Hall and Hitch (1939) question the model as a foundation for firm behavior
  - "assume the general relevance of the simple analysis in terms of marginal cost and marginal revenue" and "that production is carried out to the point where this elasticity is equal to the ratio $\frac{P}{P-MC}$"
  - interviews of 38 business executives: "casts doubt on the general analysis of price and output policy in terms of marginal cost and marginal revenue... they are thinking in altogether different terms; that in pricing they try to apply a *rule of thumb* we call 'full cost'..."

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- key issue: tension between simple economic model and business practice

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- key idea: rational with a different objective function rather than irrational
- but, conclusions are drawn from very loose verbal arguments, but he recognizing this limitation: "A completely novel and highly ingenious general theoretical apparatus for such a solution of the oligopoly problem has recently been created by John von Neumann and Oskar Morganstern... Unfortunately, at the time of writing this article I had no opportunity of obtaining a copy of this important book."

Early History

- Simon (1955): "the task is to replace the global rationality of economic man with a kind of rational behavior that is compatible with the access to information and the computational capacities that are actually possessed by organisms"
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- in contrast to the current literature, the focus is almost exclusively on firm's deviation from profit-maximization rather than on consumer irrationality
  - implicitly assumed in the given demand curve, i.e., whether the demand curve reflects the aggregation of utility-maximizing decisions or some other consumer behavior would not affect the analysis

Alternative Approach I: Rule-Of-Thumb

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- however, as Smallwood and Conlisk (1979) point out, "a would-be optimizing consumer who took account of market popularities would be involved in a massive game theory problem with all other consumers. Is it really plausible that he could solve the game?"

The Rule-Of-Thumb Approach

- posit rules of thumb that consumers are assumed to follow and this has two advantages:
  - in some models it seems implausible that consumers would do the "rational" calculations
  - rule-of-thumb papers tend to provide more analysis of robustness: models are simpler, could do more

Smallwood and Conlisk (1979)

- a beautiful example of rule-of-thumb approach: effect of product quality on market share
  - consumers in a market chooses from K brands at $t = 0, 1, 2, ...$
  - a consumer of product i in t experiences a "breakdown" (e.g., a disappointing experience) with probability b_i

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- specifically, assume each consumer continues to use the same product until he experiences a breakdown
- when a breakdown occurs, the consumer re-enters the market and chooses product i with probability proportional to $m_i(t)^\sigma$, where $m_i(t)$ is the market share of i
  - $\sigma = 0$: purely random choice
  - $\sigma = 1$: ask one randomly selected friend and purchase the friend's purchased product (like social learning)
  - question: how is this different from a rational model, e.g., a random utility model?

Smallwood and Conlisk (1979)

- connection between behavior at the consumer level and efficiency of product adoption
  - when $\sigma < 1$, higher quality products eventually become more popular regardless of the initial conditions, but all products have positive market shares in the long run
  - when $\sigma > 1$, this is not true and an inferior product can come to dominate the market if its initial market share is sufficiently high
  - when $\sigma = 1$, the highest quality products always dominates in the long run, so limited rationality at the individual level (simply copying decisions) can make product adoption socially optimal in the long run!

Smallwood and Conlisk (1979)

- the paper presage future developments: it pairs irrational consumers with strategic firms to endogenize the product qualities
  - "Firms, unlike consumers, will be assumed to solve optimization problems in choosing their (breakdown probability) $b_i(t)$. A rationale is that firms are better able to compute optima and are penalized more if they do not (through the force of competition)..."

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- recent psychology and economics-motivated literature: "rational firm-irrational consumer" has become the norm
  - what firms do to exploit irrationality is often the primary focus

Alternative Approach II: Explicit Bounded Rationality

- computational limitations (Simon's initial motivation): team theory
  - a firm is modeled as a group of agents sharing a common objective
  - optimal action depends on an unknown state of nature; each employee has some information
  - complications: cost of gathering information of each agent; costs of communicating information
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- why might this theory be useful?
  - information-cost-based microfoundations that can guide our choice of rules of thumb, e.g., how information costs affect monopoly and oligopoly behaviors (traditional analysis ignores information costs)

Alternative Approach III: Empiricism as "Behavioral Economics"

- Joskow (1973) "Pricing Decisions of Regulated Firms: A Behavioral Approach"
- probit model
  - dependent variable: apply for an increase in its electric rate
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- why called "behavioral"?
  - if $X_i\beta + \epsilon_i$ is the actual profit function, then the model estimate it consistently
  - if profit function is nonlinear but firms follow an irrational rule-of-thumb $X_i\beta + \epsilon_i$, then probit regression no longer estimates profits, but still a consistent estimator of behavior
  - in many applications, whether it is profit or behavior is irrelevant
  - in a sense, any "reduced-form" empirical analysis could be defended in this way

Next Class Presentation

- Glenn Ellison and Drew Fudenberg: "Rules of Thumb for Social Learning", *Journal of Political Economy*, 1993