

LXX. Are there limits to rationality as a model of human decision making?

- A. Up to this point in the course, we have explored the manner in which optimizing man can be expected to make decisions in various settings of scarcity. We have used it to characterize consumer choice, the profit maximizing orientation of firm owners, the production methods utilized, and equilibrium outputs and prices under various market structures.
- B. We have also considered how imperfect information may affect our conclusions. We have characterized an individual's demand for information, developed methods for dealing with information asymmetries faced by firm owners and employees, and consumers and sellers, we have characterized optimal search and monitoring, and suggested that the economic "law" of one price may not hold since price searching implies variance in the distribution of market prices.
- C. Although, it is clear that rational decision making does not always lead to Pareto efficient outcomes (because of externalities, monopoly power, and PD problems), our models to this point always assumed that individuals made the RIGHT choice given the resources at their disposal. They optimized.
- D. In this lecture we take up some puzzles, limitations, and extensions of the core rational choice model developed and applied thus far in this course.
 - i. Clearly we all know of cases where we make mistakes--fail to optimize--and most of us realize that we have indeed changed our beliefs or learned much about the manner in which a competitive market system operates by taking economics courses.
 - ii. We also know that in many cases, ranking goods and services involves more than very narrow self interest, and/or, moreover, may be impossible because we do not know our current or future preference ordering over our opportunity set (choosing pastry).
- E. The point of this lecture is not to undermine all that we have developed to the present point in the course, but to suggest a few ways in which the analysis has been refined, extended, and improved to tackle a broader range of human behavior.

LXXI. Knowing Thyself : The Evolution of Preferences (Becker and Stigler)

- A. The core rational decision making models all assume that tastes are more or less permanent characteristics of individuals, and moreover that individuals have complete knowledge of their preferences. Stigler and Becker (AER, March 1977) explore the extent to which changes in tastes can be modeled as the accumulation of human capital. For example, taking an art course, a history course, attending a concert or a wine tasting, may cause an individual to change his rank order of goods and services because he has "become more productive" at generating utility from art, history, music or wine.

e.g. $U = u(g(A, K_a), h(H, K_h), \dots)$
- B. Stigler and Becker claim that fundamental tastes do not change, but rather that "household production" may become more effective as specific forms of human capital is accumulated. None-the-less, their model does suggest that rank order s of goods and services may change systematically through time, partly as a consequence of decisions to invest in such consumption enhancing human capital.
- C. In cases where individuals do not know their preference ordering, it is clear that models of search and learning can be applied to explain behavior and also taste changes as the relative merits of alternatives are reassessed in light of that search and learning.

- i. Here, the behavior observed might be said to be rational given their information set.
- ii. Technological innovation in household production may also generate changes in the rank order of goods and services. (the internet, microwave ovens, poetry...)

LXXII. Time Inconsistency (Strotz)

- A. Strotz (RE Stud., 1956) introduced the idea of time inconsistency to economics, by noting that not all methods for discounting time lead to consistent behavior through time.
 - i. For example, the perceived relative discounted value of two future events, one in the near and the other in the distant future, may change as time passes without any change in the anticipated net benefits associated with either event.
 - ii. Using exponential discounting $U = \sum d^t U_t$ where d is the discount rate, implies time consistent preferences. E.g preferences that do not change through time.
 - iii. Other discount methods do not. O'Donoghue and Rabin, (AER, 1999) provide a simple example of present biased discounting: $U_t = d^t U_t - B \sum_{\tau > t} d^\tau U_\tau$. Using this function O & R note that conditions at time t are given greater weight than at any time before time t . ($d < 1$ is the long term discount rate and B is the Bias for the present.)
 - iv. The time inconsistency problem is one method by which various "odd forms of" intertemporal behavior can be addressed. For example the use of "self restraining devices" like layaways, Christmas accounts, higher than necessary tax refunds, diets, Ulysses and the Sirens.

LXXIII. Reasons within Passions (Frank)

- A. Frank (Norton, 1988, AER 1989) provides self interest based explanations of actions that economists would normally regard as either irrational, or beyond the sphere of economic analysis.
- B. For example, Frank (1989) demonstrates that a "hard wired" conscience can benefit a person. Suppose there are two kinds of persons, Type A with a conscience and type B without. There need be no hard wired difference in Type A and Type B persons as far as tastes, or honesty is concerned.
 - i. Insofar as "a conscience" provides a hard wired signal (blushing, frowning, etc.) whenever a type A person undertakes dishonest, antisocial, or malevolent behavior, it allows others to predict "A's" behavior. Moreover, a type-A person may become angry and attack those who have violated the rules.
 - ii. Obviously, to some extent this reduces A's options since he can not so readily profit from such behavior (which often requires fooling other people) as a type B person can.
 - iii. On the other hand, it also allows one to recognize Type A people. Moreover, clusters of such persons will tend to do better in social games (PD's etc.) than those lacking a conscience/signal.
 - iv. Similarly, "hard wired" Anger in response to "bad" behavior (defection in a PD etc.) tends to reduce the payoffs that a such behavior (defection) generates for a type B person. It may encourage type B persons to change his behavior with respect to type A persons.
 - v. Such emotional responses have a biological/social survival value, and may regarded as "rational" in the sense that persons are better off with them than with out them.

LXXIV. A Puzzle from Experimental Economics (excessive cooperation in PD games)

- A.** One very robust result in human PD experiments is that a substantial number of players cooperate rather than defect.
- That is to say, even though a rational individual should always defect in a (one shot or finite) PD game, real people actually cooperate a significant portion of the time. (There is some evidence the Econ Majors defect more often than most people, see Frank Gilovich and Regan (J E Persp. 1996), but still less than predicted.)
 - Similarly "generous" behavior is found in most Dictatorship games (where an individual decides how much money from amount M to keep for himself, and how much to give to some one else.) See Bohnet and Frey (AER Mar 1999).
- B.** Most experimentalists seem to believe that the "subjects" apply rules of thumb, ideas about fairness, and so forth that they use in their ordinary lives within the experiments, rather than narrow economic rationality. (See Cooper, Dejong, et. al, in JEBO, 1996.)
- Simulations developed by Axelrod ((1984, Basic Books) and Vanberg and Congleton (APSR, 19992) suggest that such cooperation oriented behavioral routines or rules can be rational in the sense that they are, on average, personally profitable.
 - The average scores in PD games are, after all, significantly higher than they would have been under "local" rationality.

LXXV. Puzzles from Analytic Psychology: Irrational Gambling and Framing Effects (Kahneman and Tversky)

- A.** Several economists and psychologists have discovered other behavior in experiments which seems inconsistent with the core rational choice models. These anomalies include "Endowment Affects," "Loss Aversion," the "Status Quo Bias," and "Framing Effects." A nice survey of these effects is included in (J Ec Persp, Winter, 1991).
- The term endowment affect was coined by Thaler (1980, JEBO). It claims that people require more to give up an object/good than they are prepared to pay to purchase it.
 - Thus foregone gains are less valuable than perceived losses (dollar per dollar)
 - Note that, if true, this has special application to evaluating urban, historical, and environmental amenities.
 - An implication of the endowment effect is that people are willing to pay a premium to keep the status quo (be that personal endowments or social states).
 - Kahneman and Tversky (1984, QJE) more or less rediscovered this idea. They report experiments that show people lose more utility in giving something up than in acquiring the same thing.
- B.** The Framing effect suggests that individual will make different decisions, in otherwise equivalent economic circumstances if the matter to be decided is "framed differently." See for example: Kahneman and Tversky (1986, J. of Bus.).
- K&T tested two alternative policy choices settings.
 - In setting I, Policy A implied that 200 of 600 people would be saved, Policy B implied that with probability $1/3$ 600 people would be saved and with probability $2/3$ 0 would be saved. [72% choose A.]

- In Policy setting II: Policy C implies that 400 people would die, and Policy D implies that with probability $1/3$ no one would die; with probability $2/3$ none would be saved. [72% choose D.]
 - Note the clear "framing effect," since $D=B$ and $A=C$.
- Framing is of course the reason that "marketing" matters. That a firm is more likely to sell a product if a salesman has the "right pitch" than if he does not.
 - On the other hand, framing should not matter if individuals are fully rational and are able to filter all messages/signals for bias. Thus, framing effects suggest that individuals are not fully rational.

LXXVI. Mistaken Decisions (Heiner, Kreps)

- A.** In a series of papers, Heiner has explored implications of imperfect decision making, by which he means that individuals may make mistakes, e.g. fail to optimize. In the first paper of this series, (AER, 1983), he argues that individuals use rules of thumb and other simplified decision procedures when they generate fewer errors than local optimization would have. [Note that such rule driven behavior implies that choices will be predictable even in cases where rationality would have dictated a "mixed strategy," e.g. unpredictable decisions.]
- B.** Many Nash equilibria assume substantial ability of individuals to perfectly calculate the equilibrium strategies of their fellow players. Krebs (1990, U Princeton Press, ch12) considers how equilibrium notions must be changed if individuals are prone to making small mistakes: e.g. "trembling hand" perfection.

LXXVII. Bounded Rationality and Satisficing (Simon, Rubenstein)

- A.** All these problems together suggest that individuals may not be able to be globally rational, in the sense that they choose the very best strategy possible in every instance because of information problems, computation problems, and the possibility of mistake.
- Instead, individuals may be locally rational, or "rational within bounds" Simon (1955, QJE and in many latter publications and books).
 - Or, may simply choose strategies, hueristics, or routines that are "good enough," e.g. they may "satisfice" rather than optimize.
- B.** Rubinstein (1998, MIT Press) models various aspects of bounded rationality and explores various implications for game theory.

LXXVIII. Problem

- A.** Suppose you know that Sam faces a choice between A and B. He knows that there is a 30% chance that which ever he chooses he will make a mistake.
- Characterize his decision making process use expected utility.
 - Suppose that training T or information I can reduce Sam's error rate to 20%. What is the highest price Sam would pay for information I?
- B.** (Optional) Write a 1 page essay on the role of rationality and simplification in economic thought.