LECTURE 4 WHAT IS BEHAVIORAL ECONOMICS?

Aim: To illustrate definitions and principles of behavioral economics.

Outline: Behavioral economics: definitions and purposes. A bit of history. Methods and tools. Bounds of human nature. Applications: behavioral finance.

Readings:

Thaler, R. H. and S. Mullainathan (2008). "Behavioral Economics". In D. R. Henderson (ed.) Concise Encyclopedia of Economics (2nd ed.), Library of Economics and Liberty, Indianapolis.

Blogs, Videos and Websites:

Dan Ariely asks, Are we in control of our decisions? (17:27)

http://www.youtube.com/watch?v=9X68dm92HVI

BEHAVIORAL ECONOMICS

"Because economics is the science of how resources are allocated by individuals and by collective institutions like firms and markets, the psychology of individual behavior should underlie and inform economics, much as physics informs chemistry; archaeology informs anthropology; or neuroscience informs cognitive psychology. However, economists routinely—and proudly—use models that are grossly inconsistent with findings from psychology. A recent approach, ''behavioral economics,'' seeks to use psychology to inform economics, while maintaining the emphases on mathematical structure and explanation of field data that distinguish economics from other social sciences" (Camerer 1999)

Behavioral economics is a reunification of psychology and economics and it would preserve the distinctive emphasis on formal models and descriptive statistics that characterizes mainstream economics

F-TWIST ARGUMENT

Two key issues to deal with

1. the inconsistency of the predictions of most economic models with experimental results;

2. the rigidity of mathematical structure of that same models joined with the indefiniteness of the theoretical implications of the statistical data collected in the field

Behavioral economics approach is a clear departure from the "as if" approach endorsed by Milton Friedman.

"F-twist" argument combines two criteria:

1. Theories should be judged by the accuracy of their predictions;

2. Theories should not be judged by the accuracy of their assumptions.

FRIEDMAN'S ARGUMENTS

▸ Milton Friedman's thesis that the only thing that mattered in science was predictive power was reacting to a criticism made by Marxist economists and historical economists that mathematical economics was useless.

▸ It made so many idealized assumptions about economic processes: perfect rationality, infinite divisibility of commodities, constant returns to scale, complete information, no price setting.

▸ Mr. Friedman argued that false assumptions didn't matter any more in economics than they did in physics. Like the "ideal gas," "frictionless plane" and "center of gravity" in physics, idealizations in economics are both harmless and necessary.

▸ They are indispensable calculating devices and approximations that enable the economist to make predictions about markets, industries and economies the way they enable physicists to predict eclipses and tides, or prevent bridge collapses and power failures.

EMPIRICALLY DRIVEN APPROACH

Because theories with patently false assumptions can make surprisingly accurate predictions, economic theories that assume that individual agents are highly rational and wilful, judge probabilities accurately, and maximize their own wealth might prove useful, even though psychology shows that those assumptions are systematically false.

The empirically-driven approach to behavioral economics agrees with Friedman's criterion (1) and rejects criterion (2). Criterion 2 is rejected *because of* the primacy of criterion 1, based on the belief that replacing unrealistic assumptions with more psychologically realistic ones should lead to better predictions.

Behavioural economics emerges as the study of deviations from the paradigm of rational choice by relaxing the assumption of perfect rationality that pervades mainstream economics

AN EXAMPLE: LOSS AVERSION
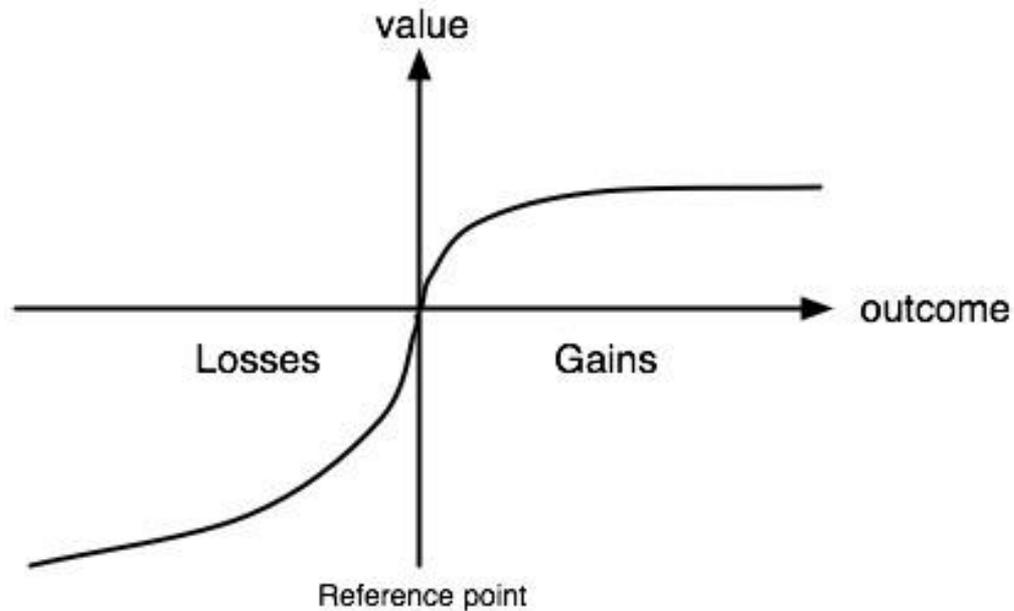
Loss-aversion is the disparity between the strong aversion to losses relative to a reference point and the weaker desire for gains of equivalent magnitude

Loss aversion is more *realistic* than the standard continuous, concave, utility function over wealth, as demonstrated by hundreds of experiments.

Loss aversion useful to predicts facts on which standard theories go wrong: equity premium puzzle in finance and asymmetry in price elasticities.

A BIT OF HISTORY

Adam Smith *The Theory of Moral Sentiments* (1759)

psychological principles of individual behavior

"we suffer more... when we fall from a better to a worse situation, than we ever enjoy when we rise from a worse to a better." (p. 311)

Jeremy Bentham *An Introduction to the Principles of Morals and Legislation* (1823) (2nd ed.)

psychological underpinnings of utility

Francis Edgeworth *Theory of Mathematical Psychics* (1881)

model of social utility, in which one person's utility was affected by another person's payoff

1925-1950 To found economics as a mathematical deductive science

Notable exceptions: **Irving Fisher**, **Vilfredo Pareto**, **John Keynes**

THE PIONEERS

George Katona

Psychological analysis of economic behavior (1951)

"genuine decision" (rational) vs. "habitual behavior".

Herbert Simon

*Models of man (*1957)

bounded rationality and satisficing behavior

Tibor Scitovsky

The Joyless Economy: An inquiry into human satisfaction and consumer dissatisfaction (1976)

arousal, joyful stimulation, novelty and variety
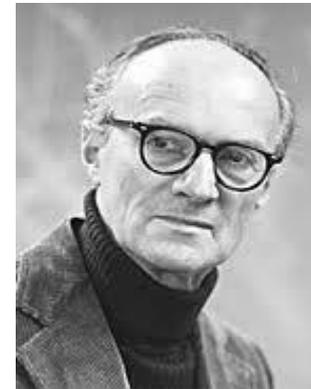
Daniel Kahneman – Amos Tversky (d.1996)

1974 Tversky, A. and Kahneman, D. "Judgment under Uncertainty: Heuristics and Biases," *Science*.

1979 Kahneman, D. and Tversky, A. "Prospect Theory: An Analysis of Decision Under Risk," *Econometrica*.
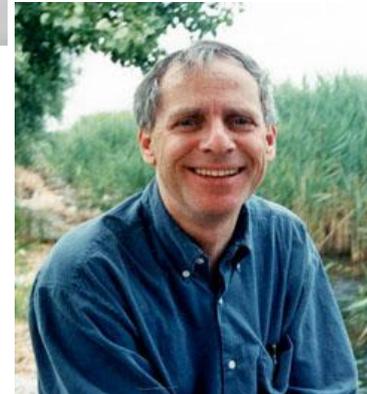
DANIEL KAHNEMAN

http://www.youtube.com/watch?v=zUMCf_ActhE (2:01)

METHODOLOGY

Step 1 identify normative assumptions or models that are ubiquitously used by Economists (i.e. Bayesian updating, expected utility and discounted utility)

Step 2 identify anomalies, i.e., clear violations of the assumption or model (i.e. subjects' confusion or transactions costs).

Step 3 use the anomalies as inspiration to create alternative theories that generalize existing models. (i.e. prospect theory)

Step 4 to construct economic models of behavior using the behavioral assumptions from the third step, derive fresh implications, and test them. (i.e. overconfidence)

Z

TOOLS

- Laboratory Experiment
- Field experiment
- Computer and virtual simulations
- Brain scans

OBJECTS

- Judgment : processes people use to evaluate evidence to take decisions
- Choice: processes people use to select among actions, taking account of any relevant judgments they may have made

KEY ARGUMENTS "NON-BEHAVIORAL" ECONOMICS

1. **Do only rational agents survive?**

   TS: who failed to max have been weeded out by evolutionary forces, which presumably operated during ancient times

   ‣ it is not necessarily true that overconfindent hunters presumably caught less prey, ate less and died younger. Overconfidence may be an appropriate level of confidence if the rational opponent choose to back down sooner
   ‣ evolution may just as easily weed out rational behavior as it does weed out quasi-rational behavior

2. **Do the workings of markets at least render the actions of the quasi-rational irrelevant?**

   TS: arbitrage opportunities exclude less than efficient choices

   ‣ markets *per se* do not necessarily solve the problem: they provide an *incentive* to switch but they cannot force people to change
   ‣ in most markets there are no arbitrage opportunities

FINAL ARGUMENT "NON-BEHAVIORAL" ECONOMICS

Individuals who systematically and consistently make the same mistake will eventually learn the error of their ways

Replies

▸ as long as there are some opportunity costs to learning or to experimenting with a new strategy, even a completely rational learner will choose not to experiment

▸ (non-optimal equilibrium simply because the cost of trying something else is too high)

▸ the time required to converge to an equilibrium can be extremely long

▸ "in the long run we're all dead" (Keynes, Letter to Duncan Grant 1917)

THREE BOUNDS OF HUMAN NATURE

Bounded rationality

Simon (1955) "The human being striving for rationality and restricted within the limits of his knowledge has developed some working procedures that partially overcome these difficulties. These procedures consist in assuming that he can isolate from the rest of the world a closed system containing a limited number of variables and a limited range of consequences"

Tversky and Kahneman (1974): "People rely on heuristic principles which reduce the complex tasks of assessing probabilities and predicting values to simpler judgmental operations. In general, these heuristics are quite useful, but sometimes they lead to severe and systematic errors"

Camerer et al.'s (1997) study of New York City cab drivers

- They pay a fixed fee to rent their cabs for 12 hours and keep all the revenues
- Max: to work longer hours on good days and to quit early on bad days
- Actual behavior: quit early on good days and work longer on bad days as if they set a target earnings level for each day and treat shortfall to that target as a loss

THREE BOUNDS OF HUMAN NATURE

Bounded willpower

▸ Real humans, even they know what is best, sometimes fail to choose it for self-control reasons

▸ People eat, drink or spend too much and exercise, save or work too little

▸ People procrastinate

▸ To be aware of this do not solve the problem

Bounded selfishness

▸ Actual behavior: people gave money to charity, do volunteer work

▸ Laboratory behavior: cooperate in prisoners dilemma or send in the trust game

AN EXAMPLE– BEHAVIORAL FINANCE

▸ Financial economics, in particular Fama's efficient market hypothesis, generate sharp testable predictions

▸ Great data readily available to test these predictions

1st Fama's Efficient Market principles (1970)

Stock prices are "**correct**" : they reflect the true or rational value of the security

Froot and Dabora (1999)

▸ Hp testable with the same stock traded in different places

▸ Royal Dutch Petroleum and Shell Transport' merger on a 60:40 basis

▸ Royal Dutch traded in US -Shell traded in London

▸ Efficient trade ratio: 60:40

▸ Actual price ratio: deviated from the expected by more than 35% (not explained by taxes or transaction costs)

OVER-REACTION

2nd Fama's Efficient Market principle (1970)

unpredictability: in efficient markets future stock price movements are not predictable on the basis of publicly available information

De Bondt-Thaler (1985)

Hp: Individuals tend to over-react to new information (or underweight prior information)

Actual behavior:

- 35 stocks performing the worst over the past five years outperformed the market over the next five years
- 35 stocks performing the best over the past five years underperformed the market over the next five years
- Past "winners" underperform while past "losers" outperform the market

Explanations (people overreact to recent bad or good news)

stocks that performed quite well over a period of years have prices that are too high stocks performed quite bad over a period of years have prices that are too low (people overreact to the bad news)

UNDER-REACTION AND DISPOSITION

Underreaction appears over shorter periods of times (six/nine months)

▸ After good news (larger earnings) stocks display momentum: the stocks going up the fastest for the first six months of the year tend to keep going up

▸ These psychological mechanisms can make predictable stock prices

Disposition effect (Mental accounting or loss aversions)

▸ Investors are less willing to sell a loser than a winner (tax law encourages the opposite behavior)

▸ Odean (1998) 15% of all gains are realized but only 10% of all losses are realized, although the stocks the loser stocks held under-performed the gainer stocks that were sold