AACREA

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Proyecto CLIMA

Behavioral Decision Theory:

How Judgments and Decisions are Made Under Uncertainty

Lesson 4

Descriptive Models of Choice

Riskless Choice

- MAUT is the normative model
  - Inconsistency in importance weights assigned to dimensions is a common empirical observation
- Descriptive result
  - Use of noncompensatory decision rules (i.e., decision rules that do NOT use and weigh all dimensions of every choice option
    - conjunctive rule
    - disjunction rule
    - elimination by aspects (variant of lexicographic rule)

Risky Choice

- Prospect Theory
  - Modification of expected utility model that was designed to fit observed choice patterns
- Mental Accounting
  - Endowment effect
  - Sunk cost effect
- Other Phenomena
  - Ambiguity Avoidance
  - Omission vs. Commission effect
- Preference Construction
  - Preference reversals
  - Contingent Valuation

Prospect Theory

- Psychological Extension of Expected Utility theory
  - by Kahneman and Tversky (1979)
- Prospects are evaluated by
  - Value function
  - Decision Weights
- Value Function:
  - Concave for gains (risk-averse), convex for losses (risk-seeking)
  - Defined over gains and losses on deviations from some reference point
  - Steeper for losses than for gains (“losses loom larger”)

If you were faced with the following choice, which alternative would you choose?

(a) A sure gain of $240.

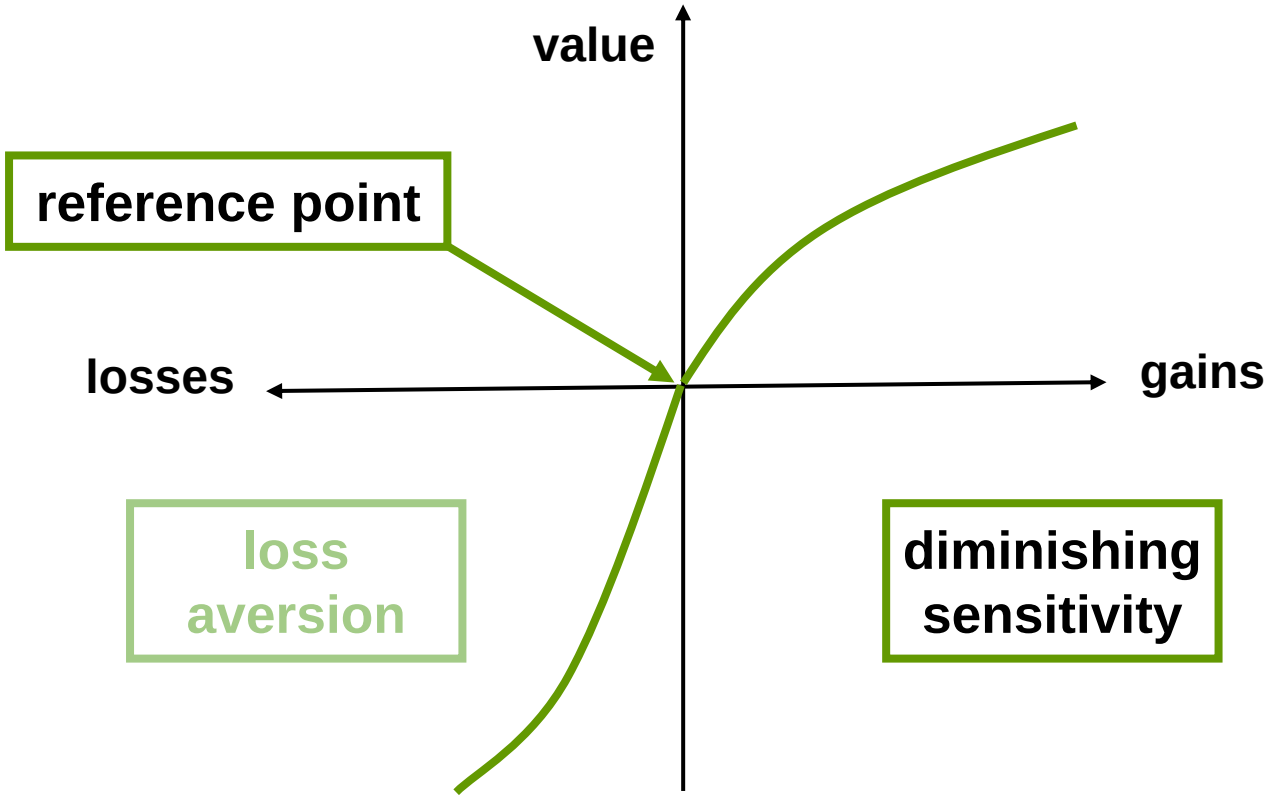
(b) A 25% chance to gain $1,000 and 75% chance of getting $0.

If you were faced with the following choice, which alternative would you choose?

(a) A 100% chance of losing $50.

(b) A 25% chance of losing $200 and a 75% chance of losing nothing.

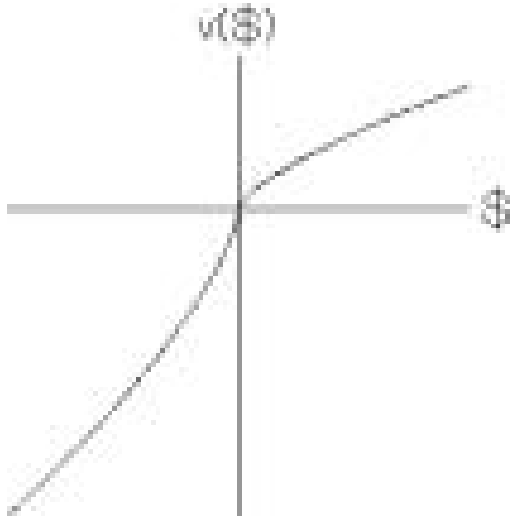
Prospect Theory



Prospect theory value function

Loss Aversion

| Pain| ≠ Pleasure



"Before he slept he reflected, as he had often reflected in other moments of triumph at the card table, that the gain to the winner is, in some odd way, always less than the loss to the loser."

From Moonraker, by Ian Fleming (1955)

A real-world example: Medical Communication

Survival Frame:

"Of 100 people having surgery, 90 will survive during treatment, 68 will survive after 1 year and 34 will survive after 5 years. Of 100 people having radiation, all will survive the initial treatment, 77 will survive after 1 year, and 22 will survive after 5 years. Which treatment do you prefer?"

Death Frame:

"Of 100 people having surgery, 10 will die during treatment, 32 will have died by 1 year, and 66 will have died by 5 years. Of 100 people having radiation therapy, none will die during treatment, 23 will die by 1 year, and 78 will die by 5 years. Which treatment do you prefer?"

PREFERENCES FOR RADIATION OVER SURGERY:

GROUP	N	SURVIVAL FRAME	DEATH FRAME
STUDENTS	357	17%	43%
PATIENTS	504	22%	40%
PHYSICIANS	435	16%	50%

Increase in preferences for radiation among all groups (especially physicians!) when options framed in terms of deaths.

Why? Framing focuses attention on different outcomes (e.g., 10% chance of loss of life during the surgery treatment under death frame

REFERENCE POINTS (Prospect Theory)

- Reference point assigned a value of 0 (neutral)
- Reference point determines if outcomes are psychologically coded as gain or loss
  - may or may not correspond to current asset position (depending on whether person has adjusted from recent wealth changes)
  - could be an aspiration level or a feared level or an expected level
- Reference point shifts may change preferences

"Would it be possible for you to totally exaggerate how much it will cost and how long it will take, so we'll be pleasantly surprised at the end?"

Power of Expectations

- Influencing the impact of news by "managing" expectations
- Political handlers as masters of the expectation-management trade

Half of you are given a relatively nice Columbia University pen and the other half is not. You are then asked:

- If you were given the pen, what is your selling price?
- If you wanted to buy the pen, what would be your buying price?

Question: What should happen here, according to economic theory?

What did happen?

- Buying prices? $1.25
- Selling prices? $2.46
- Ratio: 1.97

- Why?

Endowment Effect

Consequence of prospect theory value function

Loss aversion adds value to things we own

- Loss of certain object/magnitude is perceived as more negative than the gain of same object/magnitude is positive
- Because of this gain/loss asymmetry, we value things that we own more than things we do not own

- Beware of irrational demands in negotiations because of endowment effect
  - Both for own demands and demands of negotiation partner
  - Make other side aware of fact that they may be suffering from endowment effect

Prospect Theory and Framing

- Why does framing work?
  - Nonlinearity of value function.
  - Options evaluated in relation to reference points.
  - Different risk attitudes toward gains and losses.
- Why does framing matter?
  - Power to person who presents options to decision makers
  - Framing may change our experience of outcomes.
- So what should we do?
  - Be aware of the phenomenon.
  - Reframe: Systematic examination of alternate frames.

Allais Paradox

- If you were given a choice which of the the following gambles would you prefer?

(a) $1,000,000 for sure.

(b) A 10% chance of getting $2,500,000 and a 89% chance of getting $1,000,000 and a 1% chance of getting $0.

If you were given a choice, which of the following gambles would you prefer?

(a) An 11% chance of getting $1,000,000 and an 89% chance of getting $0.

(b) A 10% chance of getting $2,500,000 and a 90% chance of getting $0.

Decision Weight Function and CERTAINTY EFFECT

- Definition of CERTAINTY EFFECT
  - Overweighting outcomes that are certain relative to those that are probable
  - Reducing the probability by a certain amount has more impact when outcome was initially certain than if it was merely probable.

- Certainty effect strengthens risk aversion in the domain of gains and risk seeking in the domain of losses

Mental Accounting

Suggested by Thaler (1980)

- Non-fungibility of money and other resources between accounts
- Solution to human constraints
  - limited attention and information processing capacity
- Also used as a solution to self-control problems

Imagine that you have decided to go to a play where the admission price is $40 per ticket. Just before entering the theatre, you discover that you have lost the ticket. The seat was marked and the ticket is not replaceable. Would you buy a new ticket for $40 (assuming that you have the money)?

Imagine that you have decided to go to a play where the admission price is $40 per ticket. Upon opening your wallet to pay for your ticket, you discover that you have lost $40 dollars in cash. Would you still pay $40 to see the play (assuming that you have the money)?

Sunk costs

- Failure to adjust a reference point appropriately
  - only additional costs and benefits should drive decisions
  - but people frequently FAIL to reset their reference points and keep mental accounts open, trying to balance them
  - Paying for the right to use a good or service will increase the rate at which the good/service will be used
  - Healthclub example
  - Decision to harvest a crop should only depend on the revenue it will generate, not on previous input costs

Ambiguity Avoidance

- People prefer to bet on known odds rather than on ambiguous odds of equal size
  - Ellsberg's paradox

Ellsberg's Paradox

- Imagine an urn known to contain 90 balls. Thirty of the balls are red, the remaining 60 are black and yellow in unknown proportions. One ball is to be drawn at random from the urn.

  Consider the following actions and payoffs:

Situation X

	30	60	
	Red	Black	Yellow
Act 1. Bet on red	$100	$0	$0
Act 2. Bet on black	$0	$100	$0

Situation Y

Act 3. Bet on red or yellow	$100	$0	$100
Act 4. Bet on black or yellow	$0	$100	$100

Omission vs. Commission Effect

- People prefer to be wrong (feel less regret) when the bad outcome is the result of a lack of action (an *omission* to act) than when the outcome is the result of an action they took (a *commission*)
  - Vaccination example
  - Acting or not acting on the availability of new information or a new technology

How to deal with response inconsistencies as function of method/frame?

- Conduct sensitivity analysis to see whether difference matters
- If so, should we confront people with their inconsistent answers ?!? Which answer is "correct"? Compromise?
- Use (or put greatest weight on) method that comes closest to the way that utility or preference information will ultimately be *used*

  → compatibility principle of preference elicitation