Prospect theory

Prospect theory

- Developed by psychologists Kahneman & Tversky (1979)
- theory of choice under conditions of risk

- Can be applied to real life situations

- Evaluates **situations involving risk** and shows that people respond differently to a risk depending on whether the outcome is a **gain or a loss in regard to a reference point**

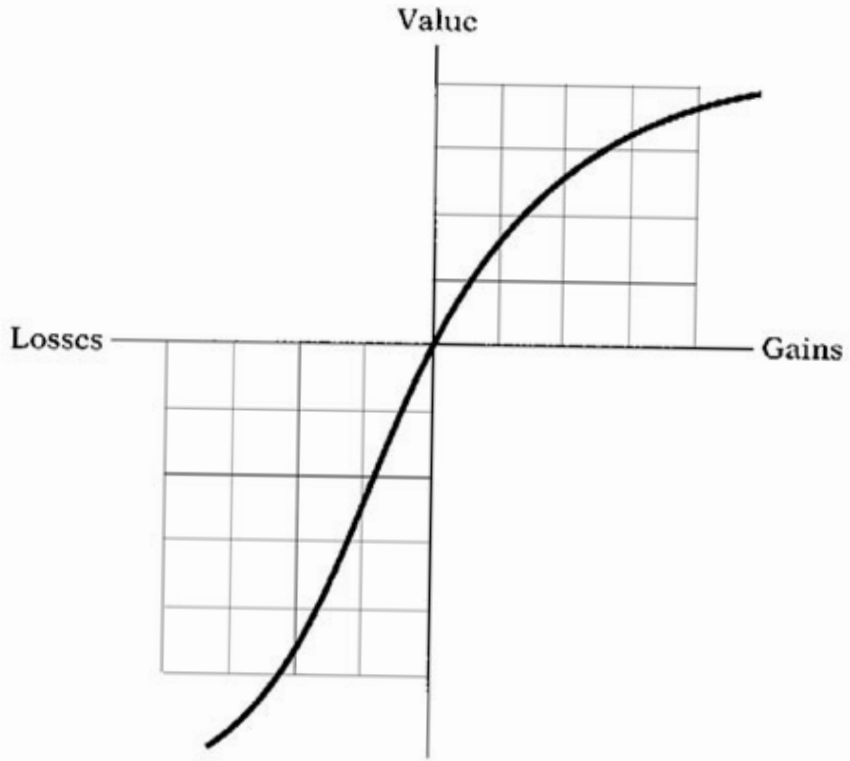


FIGURE 9.1
A hypothetical value function in prospect theory. *(Figure adapted from Kahneman and Tversky*

Expected utility theory vs. Prospect theory

- Expected utility theory - coherent and consistent weighing of the outcomes (gains or losses) of actions (alternatives) by their probabilities (with payoffs assumed to be independent of probabilities).
- The alternative which has the **maximum utility is selected**
- Expected utility theory is based on three fundamental tenets about the processes that occur during decisions made under risk and uncertainty and based on these assumptions, expected utility theory predicts that the better alternative will always be chosen
  - (1) **consistency of preferences for alternatives**;
  - (2) **linearity in assigning of decision weights to alternatives**;
  - (3) **judgment in reference to a fixed asset position**
- Expected utility theory - characteristics of the contex???
- Prospect theory - provides empirical evidence from "problem studies" where preferences violated the axioms of expected utility theory (Kahneman and Tversky, 1979)

Basics - PT

- Inductive theory - based on experimental studies, but has been proven to apply to real life situations (e.g. insurance, consumer economics)
- Decision makers prefer to **simplify their choices** cognitively whenever possible, satisficing rather than maximizing
- Choice is a **two-stage process**. In its first phase (*framing*), alternatives are edited and values are attached to outcomes and weights to probabilities. In the second phase, similar to expected utility theory, the edited *alternatives are evaluated*.
- How people frame a problem around the **reference point** is critical to their choices
- People tend to **overweight losses** with respect to comparable gains
- People tend to **engage in risk-acceptant behavior** with respect to losses
- People respond to **probabilities** in non-linear manner

- Three consistent **violations of expected utility theory:**
- First, people consider choices as adjustments to their current wealth from a personal reference point. They tend to be risk averse toward adjustments seen as gains, and risk seeking toward adjustments seen as losses from this point. (vs. consistency of preferences for alternatives)
- Second, decision makers tend to overweight unlikely events and underweight likely events when assigning probabilities, and they do not adequately distinguish between large numbers. (vs. linearity in assigning of decision weights to alternatives)
- Third, the manner in which alternatives are presented can influence the choices made (vs. judgment in reference to a fixed asset position)

Prospect theory - main points

- Assymetry between gain and losses

- Loss aversion
- Risk orientation
- Reference point

Loss aversion

- People are extremly sensitive to losses compare to gains

- Greater value assign to losses than comparable gains
- "I have to lose more than I love to win"

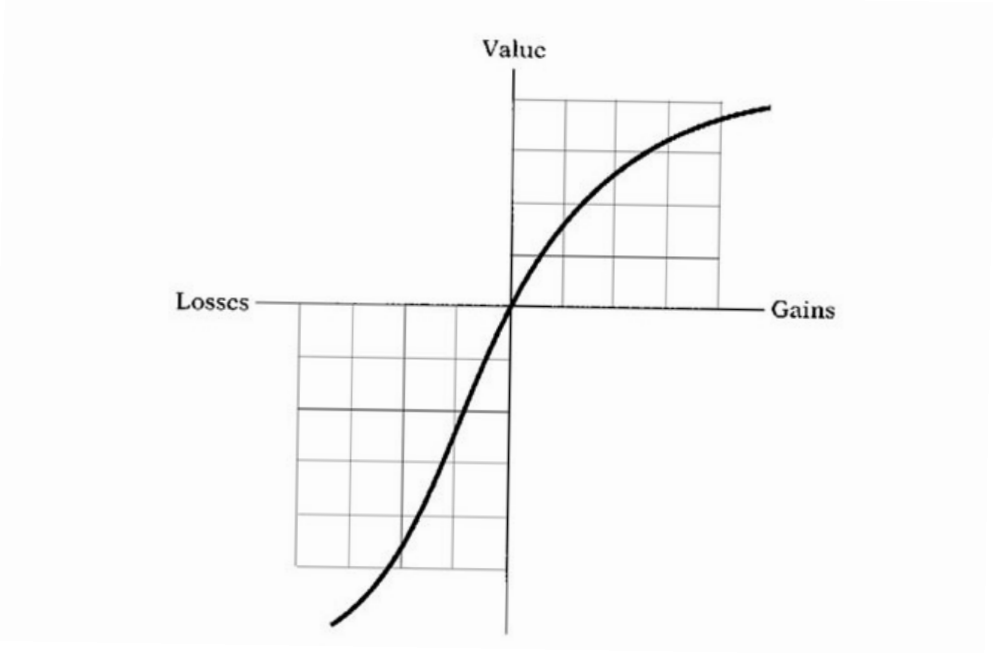
Loss aversion

- Endowment effect
- People tend to value what they have more than comparable things they do not have...
- e.g. refusal to sell an item for the price they would have not consider buying them in the first place (ration is about 2:1)

- Gaining something and then loosing it does not leave one in the same place in terms of psychological value of one's assets.

- Having the money and then loosing them is much worse than not having the money in the first place

- Hyperinflation ...is much worse than deep recession. Hyperinflation robs you of you have now (savings) while recession robs you of what you might have had (higher standard of living if the economy had grown)



Loss aversion example

Home and contents

We know that there is a lot at stake when you're a home owner. That's why our Home and Contents Insurance provides protection you can depend on for unforseen loss or damage to your property.

You'll find our plain language policy information easy to read. It states clearly what is covered and what isn't, so you know exactly where you stand. We offer a quality new for old policy with no hidden catches when it comes to new for old.

Our policies are flexible - allowing you to add options that are important to you, and to suit your needs and budget. Optional covers you may want to consider.

How do I protect my possessions?

Home Buildings and Home Contents Insurance

Imagine how you'd feel if your house was burgled, or worse still, if a fire damaged or ruined your home.

These things do occur and you just hope that it won't ever happen to you. But if it did, and you were insured, things wouldn't be so bad.

- Insurance **relies** on people's aversion to loss.
- Presentation of potential loss emphasized - insurance sales go up
- Also...sensitivity to events with low chance of occurring

Risk orientation

- People tend to be risk averse in choices regarding gains
- BUT
- risk-acceptant with respect of losses

Risk orientation

- Strong aversion to losses, especially "dead" losses (perceived as certain as opposed to probable ones) induces people to take risks in a hope to avoid even greater loss
- ...even when this behavior (choice) may lead to even greater loss

Reference point

- How the problem is framed (what is considered gain and what is loss) depends on the reference point
- Change in the reference point can result in the change of preference (when when outcomes remain the same) Consider following:
- Would you go for a medical treatment that has 90% success rate?
- Would you go for a medical treatment that has 10% failure rate?
- Focus on gains and losses will affect decision makers evaluation of options
- e.g. economic policies differ if unemployment is stated as 10% or the percentage of people in work force is 90%
- PT - can help to explain **reversals in preference** based on frames, rather than by changes in subjective utilities or probabilities

Reference point

- Laboratory vs. real world dilemmas
- Common reference point - status quo

- Even when problem is well-structured and status quo can serve as reference point
- aspiration lever
- expectations
- social norms
- social comparisons
- recent losses

Reference point

- Commonly - status quo
- This is violated in **dynamic situations** where no stable status quo is obvious
- e.g. sequence of successive choices (vs. single choice) - reference point?

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- Commonly - status quo
- This is violated in **dynamic situations** where no stable status quo is obvious
- e.g. sequence of successive choices (vs. single choice) - reference point?
- Position at the beginning of sequence or in respect to current position at the end of each choice?
  - Depends on outcome: gain or loss
  - People "renormalize" their reference points after making gains much more quick than after losses
  - **Instant endowment effect**

"Sunk costs"

- Implication:
- After making series of gains - reference point is "renormalized" around new status quo (instant endowment effect)
- Any subsequent setback is LOSS rather than FOREGONE GAIN
- This loss is overweighed compared to comparable gain - people engage in risk-seeking behavior (to avoid loosing even more)
- After series of losses - no "renormalization" of new status quo
- Any improvement will be perceived as still short of original position- risk-seeking behavior
- Found in: gamblers, horse race betting, experiment-driving in snowstorm for a game because with purchased tickets

- Risk orientation/Loss aversion
- Risk seeking
- Framing- reference point

- **Certainty effect -** people respond to probabilities in non-linear manner

Certainty effect

- Outcomes that are certain are overweighed relative to outcomes that are merely probable
  - If probability of an outcome is not small, people tend to **give more weight to possible utility** of the outcome rather than probability of its occurrence

- Small probabilities are overweighed and moderate or even high probabilities are underweighted
  - When probability of the outcome is small, people become more unpredictable - consider people buying the insurance for rare catastrophic events.

Example

- Consider 2 candidates in elections with 2 different economic policies along with predictions of 2 economists about the standard of living index.

- Brown: SLI - $ 65 000 (economist 1)
- Brown: SLI - $ 43 000 (economist 2)
- Green: SLI - $ 51 000 (economist 1)
- Green: SLI - $ 53 000 (economist 2)

Problem 1

- Brown: SLI - $ 65 000 (economist 1)
- Brown: SLI - $ 43 000 (economist 2) Average $ 54 000
- Green: SLI - $ 51 000 (economist 1)
- Green: SLI - $ 53 000 (economist 2) Average $ 52 000
- Other countries SLI-$ 43 000 (economist 1)
- Other countries SLI-$ 41 000 (economist 2)

- Choice in terms of risk??? Who is riskier candidate?
- VOTE

Problem 2

- Brown: SLI - $ 65 000 (economist 1)
- Brown: SLI - $ 43 000 (economist 2) Average $ 54 000
- Green: SLI - $ 51 000 (economist 1)
- Green: SLI - $ 53 000 (economist 2) Average $ 52 000
- Other countries SLI-$ 63 000 (economist 1)
- Other countries SLI-$ 65 000 (economist 2)

- Choice in terms of risk??? Who is riskier candidate?
- VOTE

Problem 1 and 2

- Brown: SLI - $ 65 000 (economist 1)
- Brown: SLI - $ 43 000 (economist 2)

Average $ 54 000

- Green: SLI - $ 51 000 (economist 1)
- Green: SLI - $ 53 000 (economist 2)

Average $ 52 000

- Other countries SLI-$ 43 000 (economist 1)
- Other countries SLI-$ 45 000 (economist 2)
- Other countries SLI-$ 63 000 (economist 1)
- Other countries SLI-$ 65 000 (economist 2)

- Green - 72% of votes - explanation? and only 50% in problem 2
- reference point, frame, risk aversion/risk seeking

Example - status quo bias

- Status quo - reference point, moving ahead is gain, setback is loss ...tendency to maintain status quo is risky situations (risk aversion when gains are in the game)
- Hypothetical voting problem:
- Problem 1:

Frank - maintain inflation at 42%, unemployment at 15%

Carl - decrease infl. by 19%, increase unempl. by 7%

Problem 2:

Carl - maintain inflation at 23%, unemployment at 22%

Frank - increase infl. by 19%, decrease unempl. by 7%

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Frank - increase infl. by 19%, decrease unempl. by 7%

Results: Frank got 65% votes in problem 1 and 35% in problem 2

Non experimental example

- Car insurance policy (NJ and Penn).
- Choice between:
  - less expensive policy, limits on rights to recover damages
  - more expensive policy, more extensive damage claim

  In NJ: default option was "reduced rights", in Penn. "full rights".

  High stakes to consider, yet minimal effort to change insurance policy, 70% of people in NJ took reduced option (status quo) while less than 25% of people in Penn. took this option.

Status quo bias

- little misleading
- stems from assumption that there is status quo, clearly defined
- what about aspirations, expectations
- consider: aspiration level proffered to status quo, or if loss has been suffered, status quo will be treated as loss and there will be tendency to move toward status quo (or desired status quo) - possibly in risk-seeking manner

- Loss aversion, framing, status quo bias
- Voting behavior

- Politicians make greater efforts to avoid alienating key constituencies rather than strengthening their support
- Psychological costs of the former outweigh benefits of the latter.
- Negative attitude toward politicians have greater effect on citizens preference than positive attitude toward politicians.

Other arenas

- Marketing implications:
  - how an advertising message is framed
  - How is the new product positioned
  - How is product priced relative to competition and consumer expectations

  ...