

Risk Preferences

PROSPECT THEORY V:

Fourfold patterns of choices under risk

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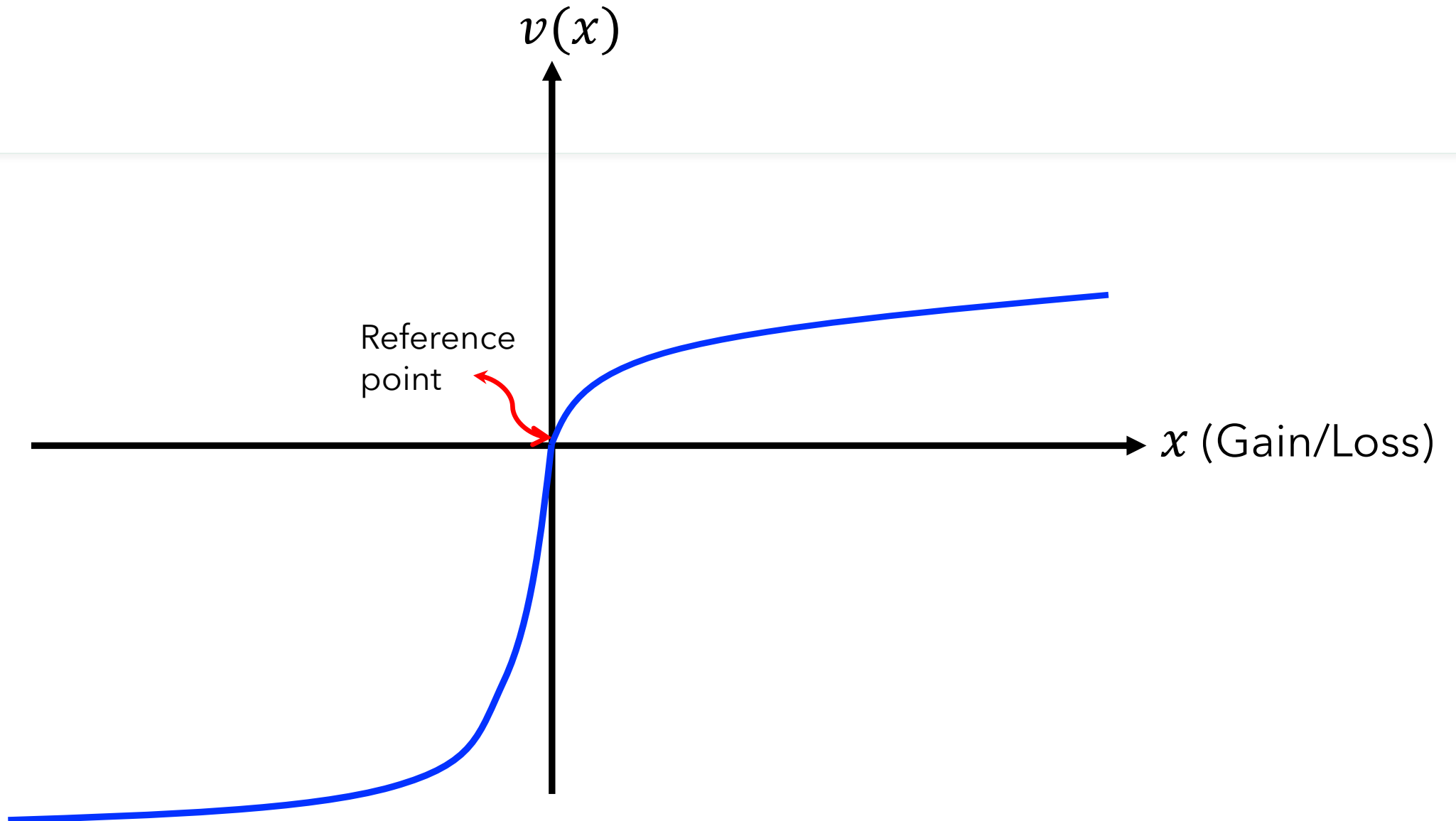


Recall: Prospect theory

- A prospect can be written as $(x, p; y, q)$ with $p + q \leq 1$.
- Note: $p + q < 1$ implies prospect yields 0 with probability $1 - p - q$.
- A person evaluates a prospect $(x, p; y, q)$ according to the functional

$$V(x, p; y, q) = \pi(p)v(x) + \pi(q)v(y)$$

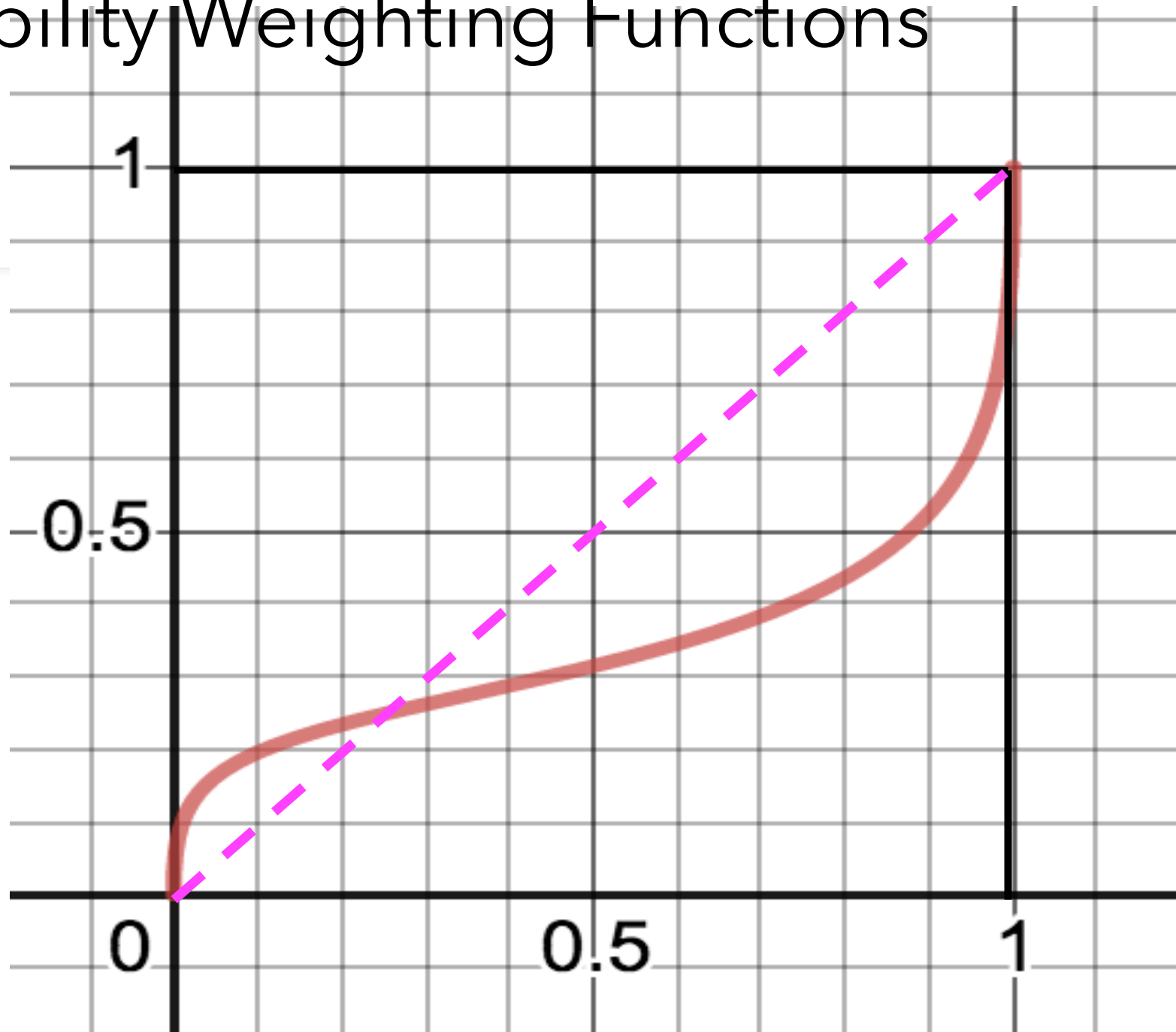
Recall: Value function $v(\cdot)$



Recall: Probability Weighting function $\pi(p)$

- The probability-weighting function $\pi(p)$ will have several features such as:
 - Overweighting of small probabilities $\pi(p) > p$,
 - Underweighting of large probabilities $\pi(p) < p$,
 - Subcertainty $\pi(p) + \pi(1 - p) < 1$,

Probability Weighting Functions



Probability weighting vs. Probability misperception

- We cannot distinguish probability weighting from probability misperception.

The Fourfold pattern of risk preferences: The core achievement of prospect theory

	GAINS	LOSSES
HIGH PROBABILITY	95% chance to win \$10,000 Risk averse + Underweighting Fear of disappointment RISK AVERSE Accept unfavorable settlement Ex: refusing low-risk high return business opportunity	95% chance to lose \$10,000 Risk seeking + Underweighting Hope to avoid loss RISK SEEKING Reject favorable settlement Ex: taking desperate gambles for a small hope of avoiding large loss
LOW PROBABILITY	5% chance to win \$10,000 Risk averse + Overweighting Hope of large gain RISK SEEKING Reject favorable settlement Ex: buying lottery tickets	5% chance to lose \$10,000 Risk seeking + Overweighting Fear of large loss RISK AVERSE Accept unfavorable settlement Ex: buying insurance policies

Choices are:

risk averse if sure thing (corresponding to the expected value) is preferred,

risk seeking if the gamble is preferred.

The Fourfold pattern of risk preferences

- For intermediate/large probabilities, risk-averse behavior over gains and risk-loving behavior over losses.
- For small probabilities, risk-loving behavior over gains and risk-averse behavior over losses.

Narrow framing vs. Broad framing

- Examine following decisions and make your choices:
- Decision (i): Choose between
 - A. sure gain of \$240
 - B. 25% chance to gain \$1,000 and 75% chance to gain nothing
- Decision (ii): Choose between
 - C. sure loss of \$750
 - D. 75% chance to lose \$1,000 and 25% chance to lose nothing

Narrow framing vs. Broad framing

- Examine following decisions and make your choices:
- Decision (iii): Choose between
 - AD. 25% chance to win \$240 and 75% chance to lose \$760
 - BC. 25% chance to win \$250 and 75% chance to lose \$750

Narrow framing vs. Broad framing

- Majority of respondents chose:
 - A. in decision (i);
 - D. in decision (ii).
- AD is dominated by BC.
- It is costly to be risk averse for gains and risk seeking for losses.

Narrow framing vs. Broad framing

- Two ways of understanding decisions (i) and (ii):
 - Narrow framing: a sequence of two simple decisions, considered separately
 - Broad framing: a single comprehensive decision, with four options

Narrow framing vs. Broad framing

- A rational agent will engage in broad framing.
- A rational agent will use mental efforts to enforce consistency. Econs will be coherent in their choices.
- Humans are naturally narrow framers.
- We are susceptible to WYSIATI (What You See Is All There Is). That is, we use the information we have as if it is the only information.
- We are averse to using mental effort.

Inducing to use broad framing

- “To think like a trader”
 - helps with loss aversion and endowment effect
- “Treat this problem as one of many monetary decisions, which will sum together to produce a portfolio”
- Broad framing blunt the emotional reaction to losses