Behavioral Economics:

decision making & opportunities ?

It is all about

Free lunches !

"Free Lunches"

- In Economics there is no free lunch
  - Standard economic theory assumes that all agents (consumers and organizations alike) are rational agents working effectively to maximize their own welfare. Since all actors in the marketplace are assumed to be at a state of maximized returns, it follows that there are no "free lunches."
  - After all, the world is optimal at its current state

"Free Lunches!"

- In Behavioral Economics there are are all kind of inefficiencies, and thus many free lunches
  - The emerging field of behavioral economics routinely demonstrates that individuals and organizations do not maximize their own welfare and instead follow suboptimal decision strategies and succumb to different decision traps.
  - While this view of human rationality can be a bit depressing, it also implies that the marketplace is full of free lunches.

Differences have implications for:

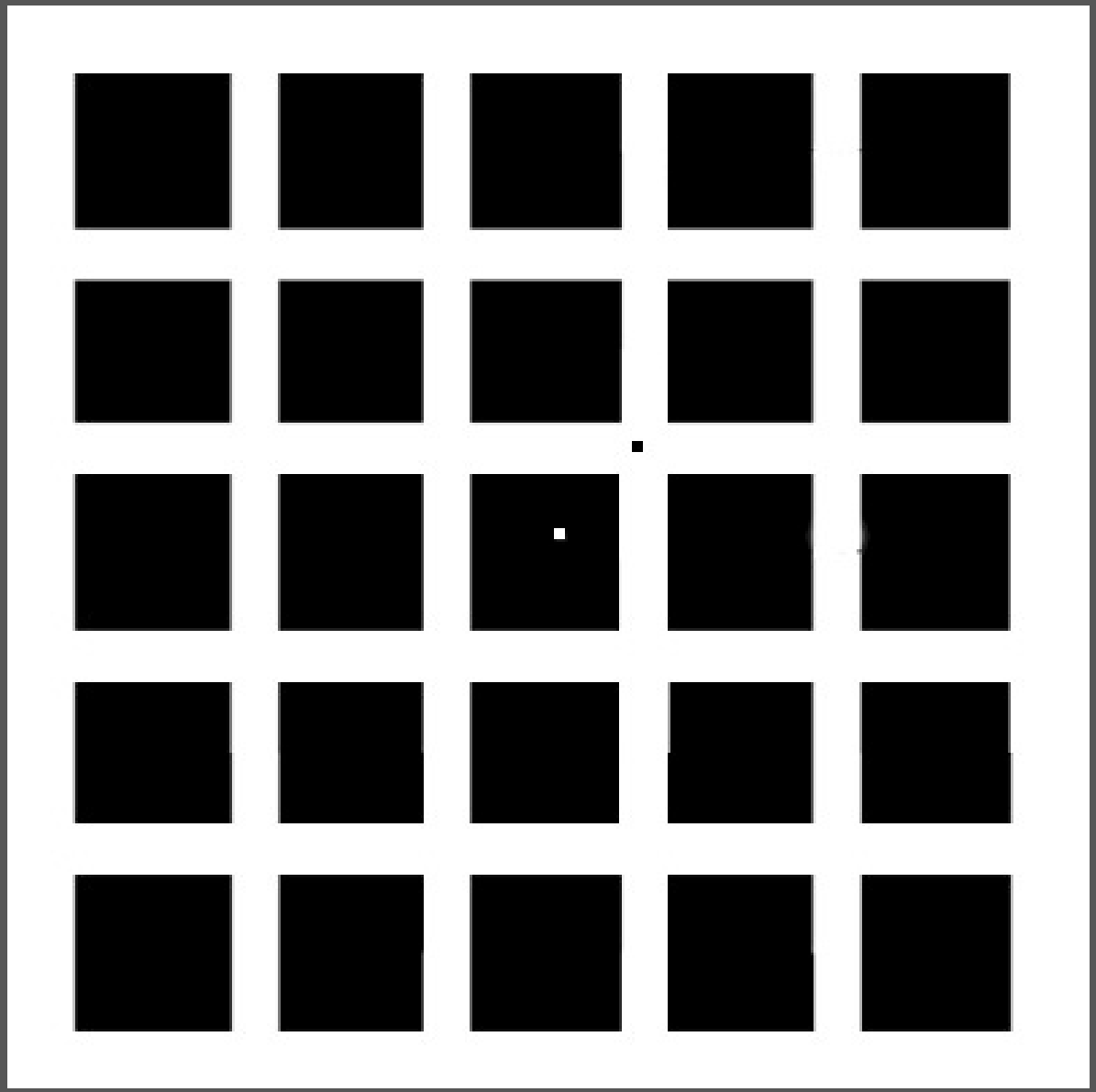
- Theory
- Individuals' decisions
- Businesses' strategies and offerings
- Policy (taxes, medical insurance, welfare, infrastructure & educational investments, role of EPA, the efficiency of free markets etc.)

Psychological views on rationality

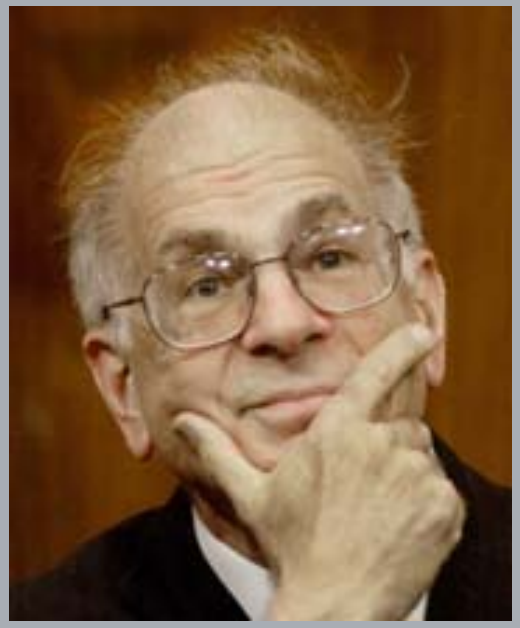
- **Bounded Rationality:**
  (***Herbert Simon, 1957***)
  A human mind has limited information processing and storage capabilities, humans must use simple rules of thumb and heuristics to help make decisions and solve problems.

- **Systematic Cognitive Biases:**
  (***Kahneman and Tversky, 1974***)
  Many heuristics, or simple rules, that people use to make judgments and decisions lead to systematic and predictable errors.

Visual illusions as a metaphor for DM



Prospect theory



Kahneman

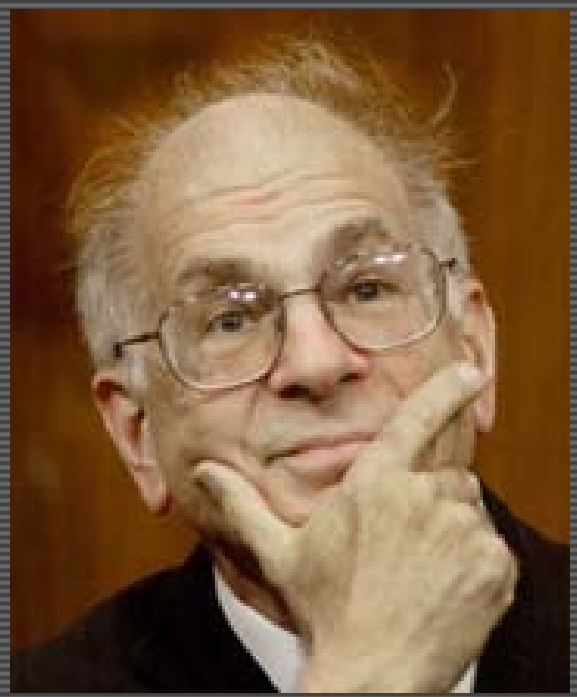
Amos Tversky

How a “simple” change in assumption can have far reaching implications

Prospect theory

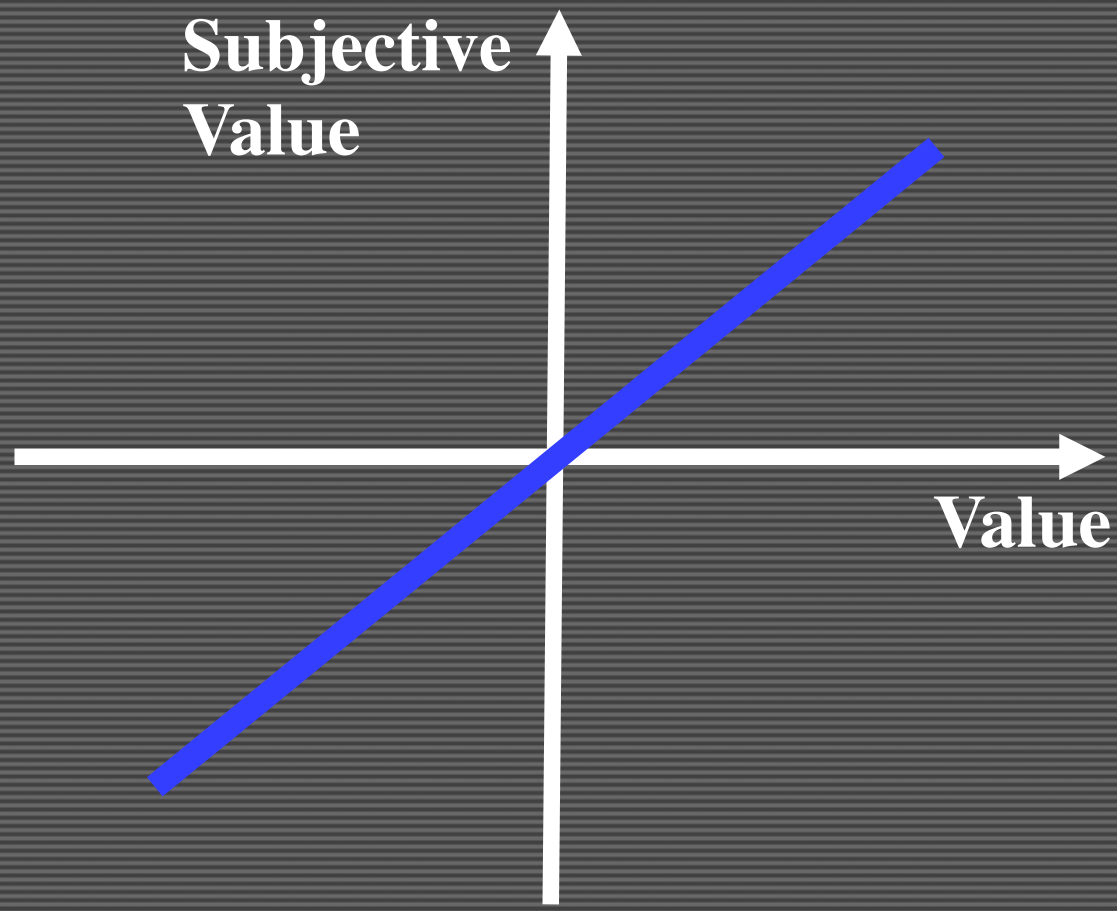
Kahneman Daniel & Tversky Amos (1979) "Prospect Theory: An analysis of Decision Under Risk" Econometrica 47 263-291

Kahneman

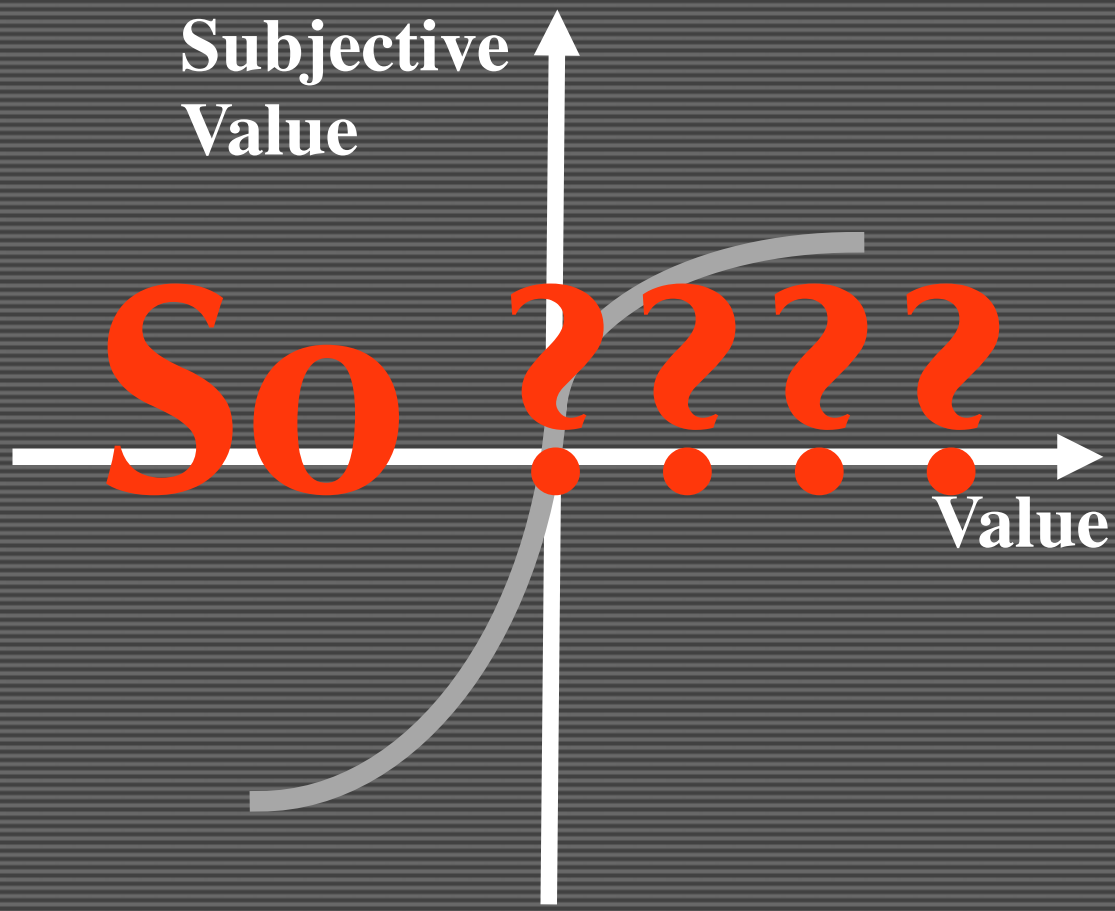


Amos Tversky

Expected utility

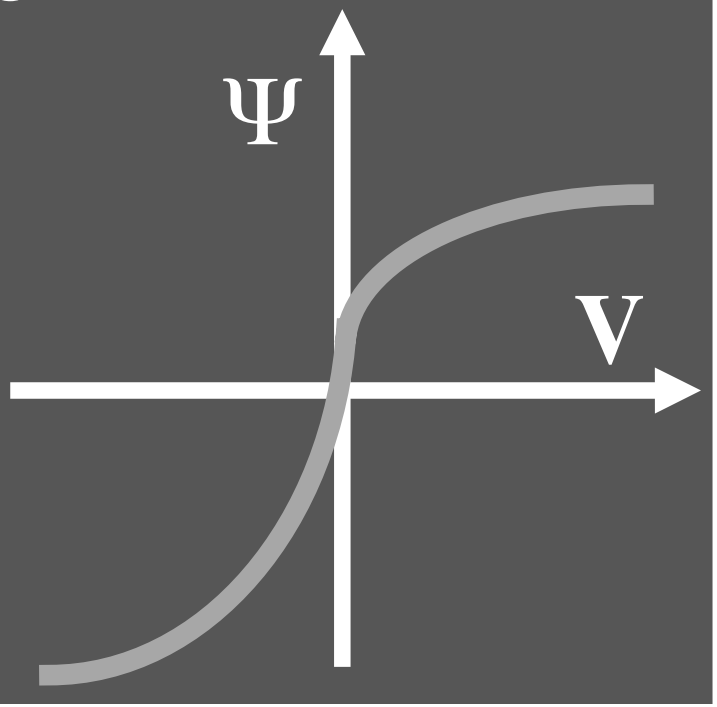


Prospect utility

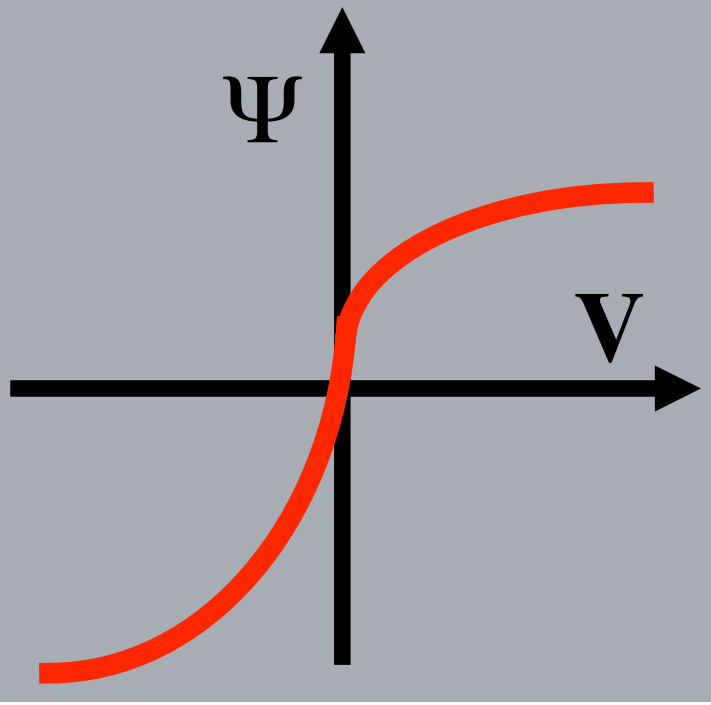


Prospect utility

- Diminishing returns
- Losses are steeper
- Pattern changes at the origin



Diminishing sensitivity



Diminishing sensitivity I

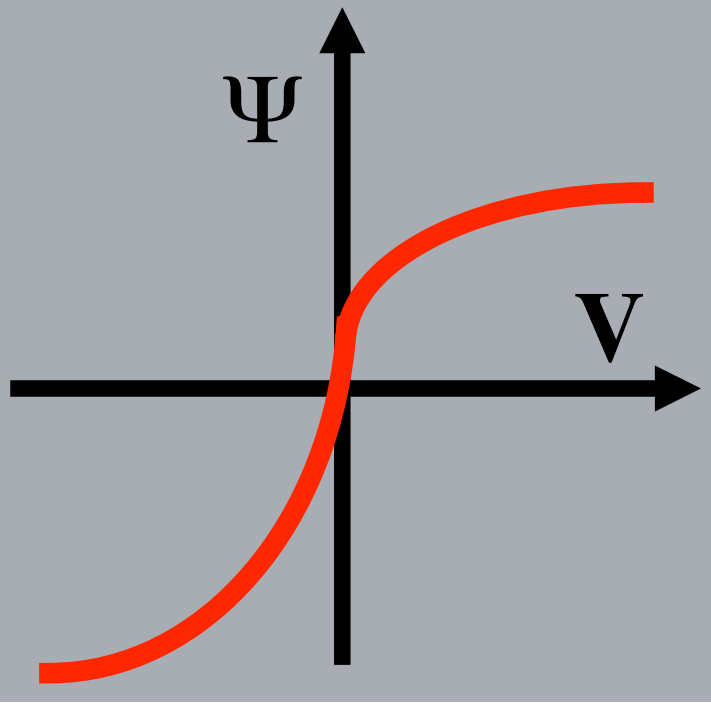
- **Buying a calculator for $15**
  - The sales person tells you that you can buy the same calculator for $8 by walking 15 min to the other store. Would you do it?

- **Buying a suit for $1,165**
  - The sales person tells you that you can buy the same suit for $1,158 by walking 15 min to the other store. Would you do it?

Diminishing sensitivity II

- Psychophysics of money
  - Spending more on cars? houses?
  - Spending more on tomatoes?
-
- Implications….

Reference point



Investments Ia

As the president of an airline company, you have invested **$10 million** of the company's money into a research project. The purpose was to build a plane that would not be detected by conventional radar,. When the project is **90 percent** completed, another firm begins marketing a plane that cannot be detected by radar. Also, it is apparent that their plane is much faster and far more economical that the plane your company is building. The question is: should you invest **the last 10 percent** of the research funds to finish your radar-blank plane?

NO - It makes no sense to continue spending money on the project.

YES - As long as $10M is already invested, I might as well finish it.

Investments Ib

As the president of an airline company, you have invested **$1,000** of the company's money into a research project. The purpose was to build a plane that would not be detected by conventional radar,. When the project is **0.01 percent** completed, another firm begins marketing a plane that cannot be detected by radar. Also, it is apparent that their plane is much faster and far more economical that the plane your company is building. The question is: should you invest **the last 99.99 percent** of the research funds to finish your radar-blank plane?

NO - It makes no sense to continue spending money on the project.

YES - As long as $1,000 is already invested, I might as well finish it.

Sunk cost

- The investment size should not relevant to the decision to continue or not.
- This is called the sunk cost effect
-
- Losses are more painful
- So we try to eliminate or delay them
- Thus, invest more because we are already “deep into it”

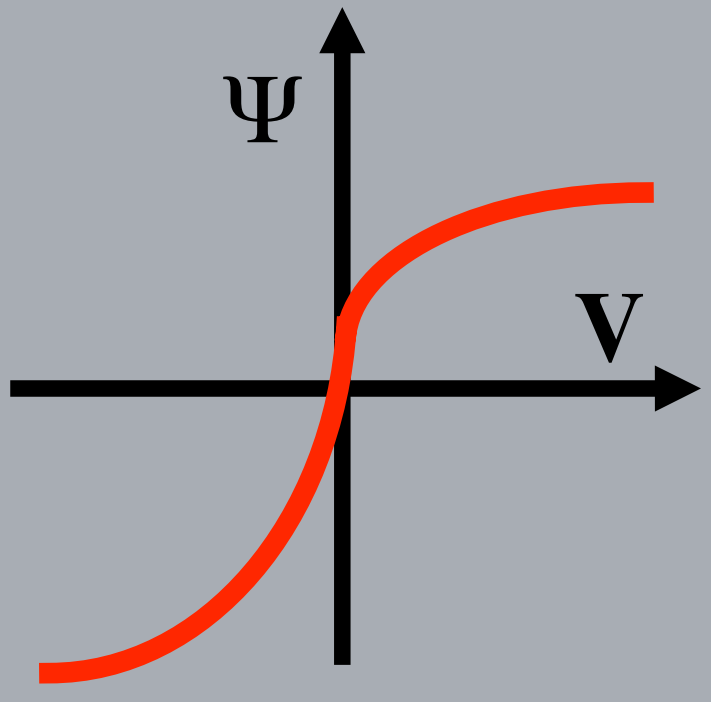
Buying tickets for a BB game

- You have a ticket for a basketball game. The drive is 60 miles, it snows and the roads are bad.
- Is the likelihood that you will go to the game different if:
  - A) you paid $10 for the ticket yesterday
  - B) you paid $100 for the ticket yesterday
  - C) you paid $100 for the ticket last year
  - D) you got the ticket for free
  - E) you got the ticket for a discount
- Diminishes over time (Arkes)

Reference points

- The current state is considered the status-quo
  - Related to defaults
- Actions are considered as deviations from the status-quo
- Deviations are losses and gains from that starting point

Losses are steeper



Loss aversion I

- Would you take the following gamble:
  - 50% to get $100
  - 50% to lose $50
  - 50% to get $1,000
  - 50% to lose $500

Loss aversion II

- Which would you choose
  - A sure gain of $240
  - 25 % to win $1,000 and 75% to win 0
- Which would you choose
  - A sure loss of $240
  - 25 % to lose $1,000 and 75% to lose 0

Buyers & sellers

- Lets trade [X]:
-
- Owners
  - Write the minimum price that you will charge to sell your [X]
- Non-owners (buyer)
  - Write down the maximum price that you are willing to pay for [X]

Trades

- Given that the roles of sellers and buyers were selected randomly, how many exchanges would you predict?
- The Endowment effect

The endowment effect

- Paying for things you own
-
- Basketball tickets you have vs. not
- Your old car
- Mugs & chocolate
- Kids ;)

Loss aversion

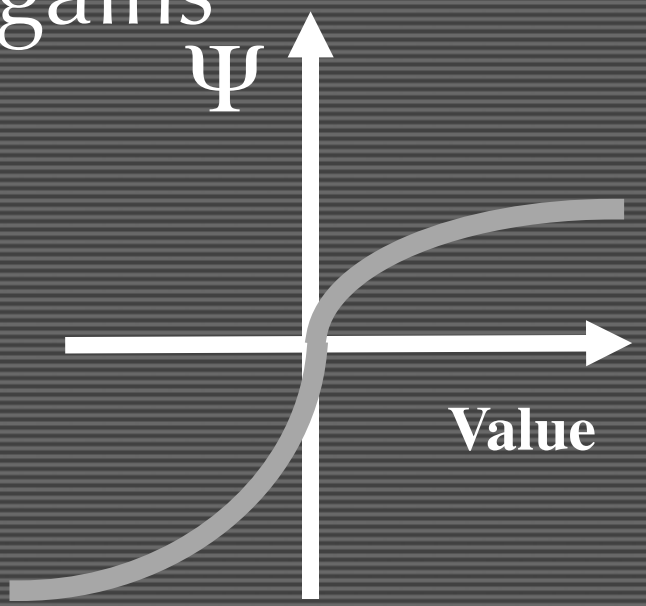
- The common ratios of the effects of gains and losses across many studies is 2:1
-
- Loss aversion is the cause for "timid decisions"
  - Particularly when considering decisions one at a time

Loss aversion: implications

- Insurance?
-
- Attachment?
-
- Other implications?

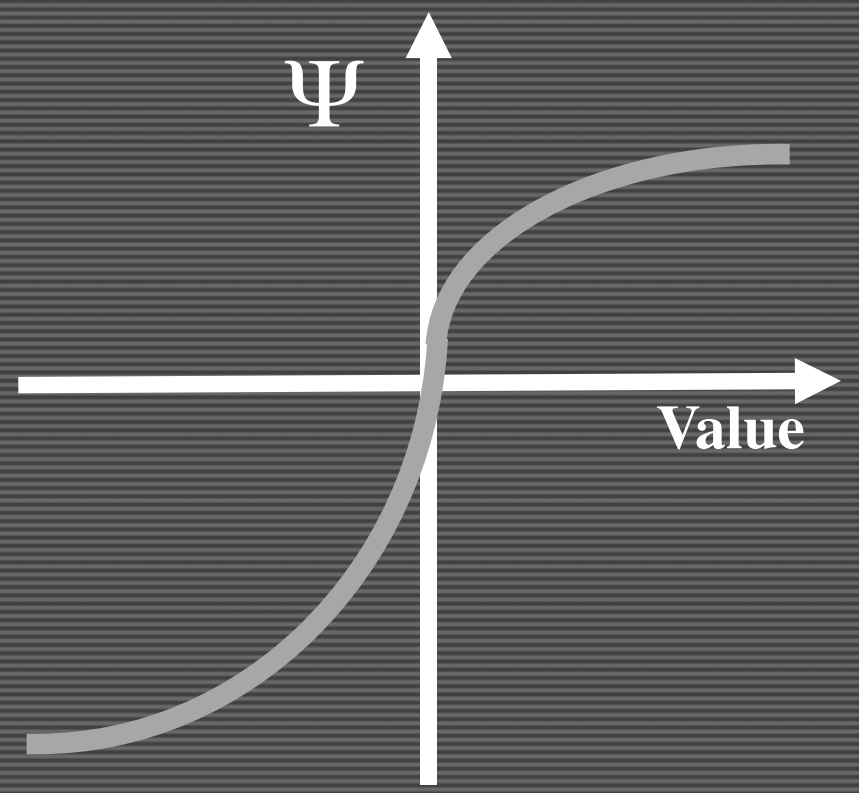
Gains and losses

- Reference points is the current point
- Changes are considered relative to the reference point
-
- Losses loom larger than gains
  - Loss aversion …
  - Also statues-quo bias



Lessons from prospect theory I

- Diminishing sensitivity
- Loss aversion
- Reference point
  - Endowment
  - Sunk cost



Lessons from prospect theory II

- The standard theory:
  - The carriers of utility are states of wealth, and people are risk-averse in wealth
  -
- Prospect theory
  - The carriers of utility are changes, gains and losses
  - People are loss averse
  -
- Accumulating empirical evidence for PT

Other applications?

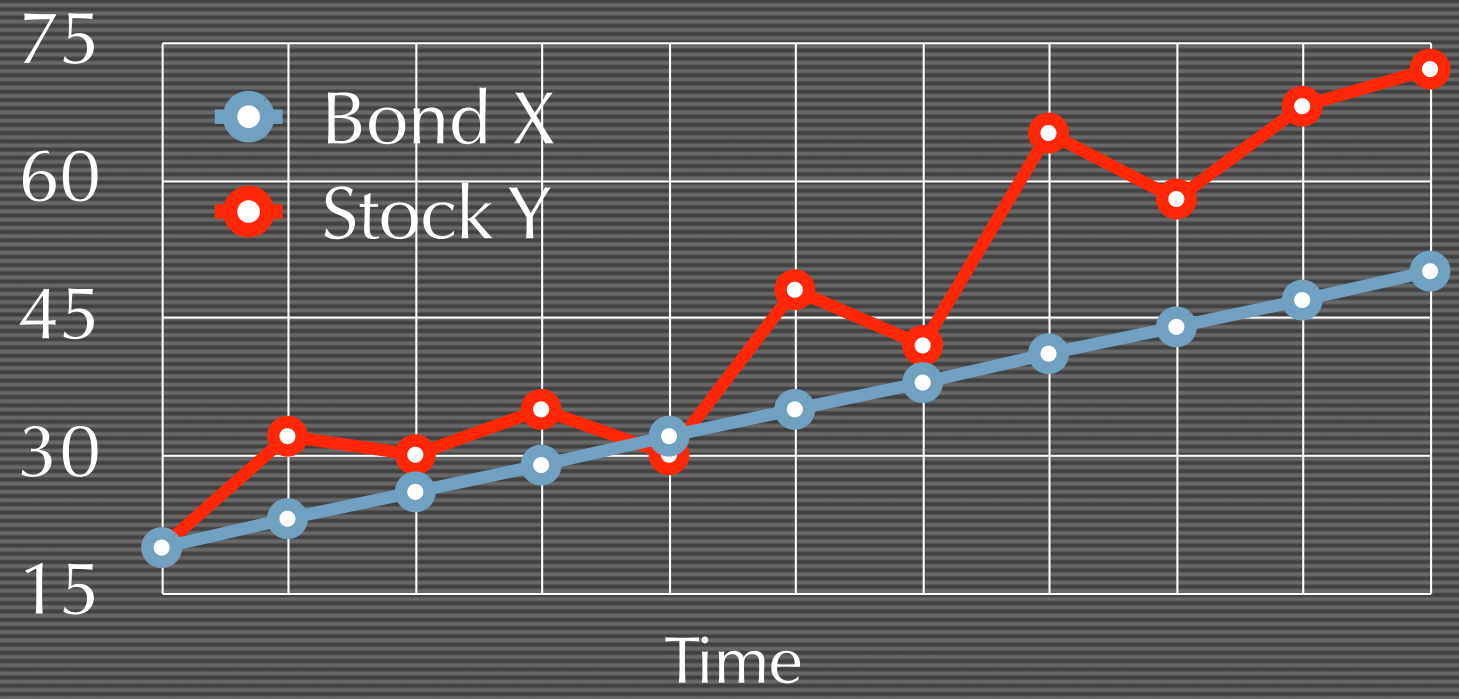
Stock market?

Equity premium puzzle I

- The equity premium puzzle
  - Stocks have been outperforming bonds
  - Large difference between rate of return on equities and treasury bills.
  - Yet many people invest in bonds
  -
- A dollar invested in stocks on 1/1/26, would yield $1800 in 1/1/98
- A dollar invested in treasury bills 1/1/26, would yield $15 in 1/1/98

Equity premium puzzle II

- Variance in returns can cause people to experience loss aversion frequently
  - As a consequence the “pain” of stocks will be higher than the “pain” of bonds



Overcoming the equity premium

- If (myopically loss averse) investors evaluated returns about once a year, puzzle would disappear.
- Personal advice: don't look often at your portfolio and don't look at individual stocks

Risk taking by professionals

- Zur Shapira (2000) found that:
- Traders took riskier positions the following day if they ended the previous day with a loss rather than a profit.
- Traders also showed a tendency to take ‘long shots’ in the last hour or two of trading at the end of the day if they were in loss at 3 o’clock.

Investments by individuals

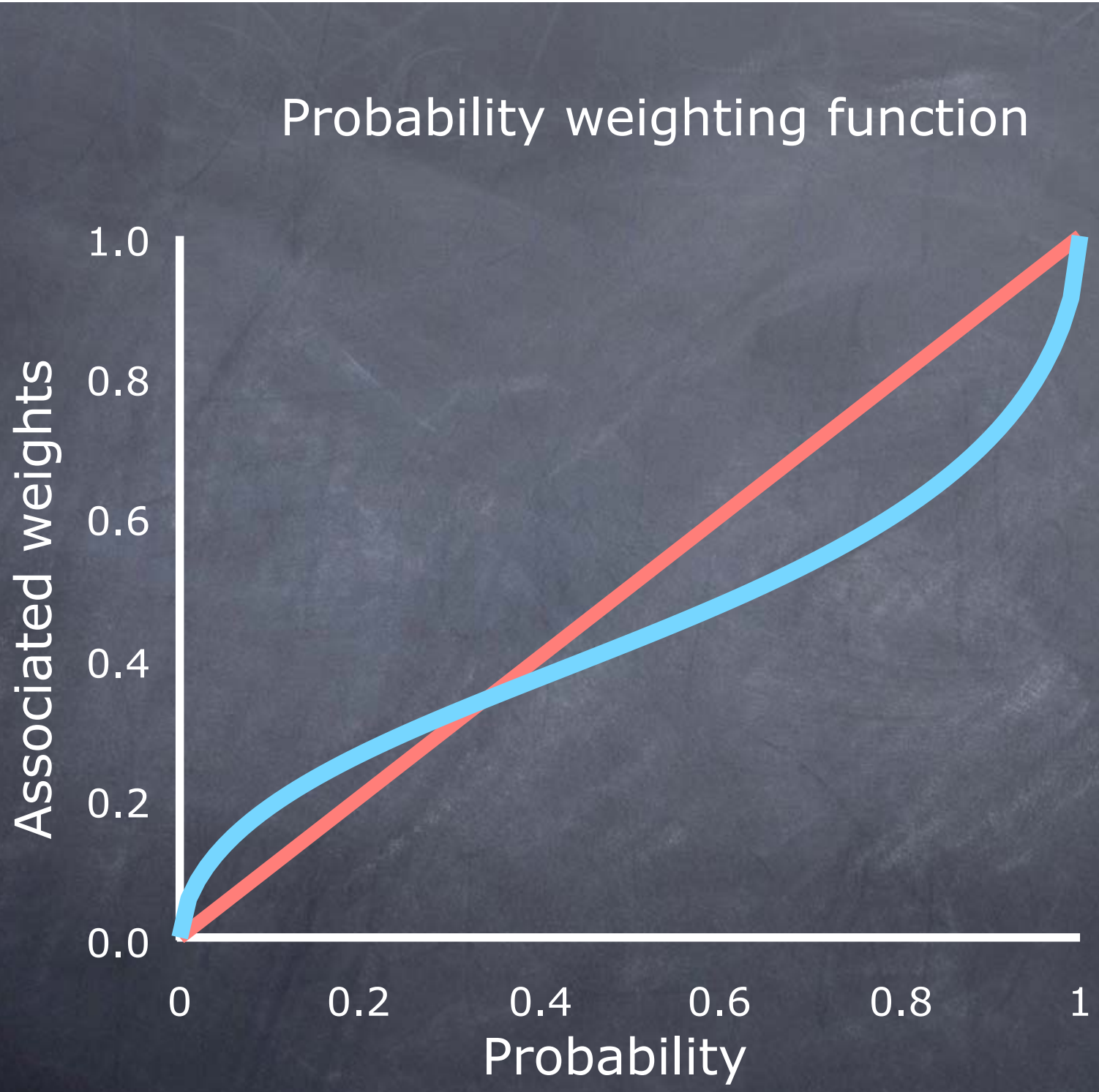
- **Observation:** The propensity to sell winners is twice as large as the propensity to sell losers (except in December)
- **Why?**
- People hold separate 'mental accounts' for different stocks
- For each stock they store the original buying price (which is irrelevant)
- As a consequence people hold on to "losers" too long

The disposition effect:

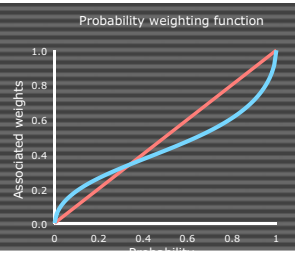
- The propensity to hold onto losers has been called by Odean the disposition effect
-
- The buying price for each stock is a salient (yet irrelevant) reference price
- Leading to reluctance to realize the loss by selling “losers”

Another aspect of prospect theory

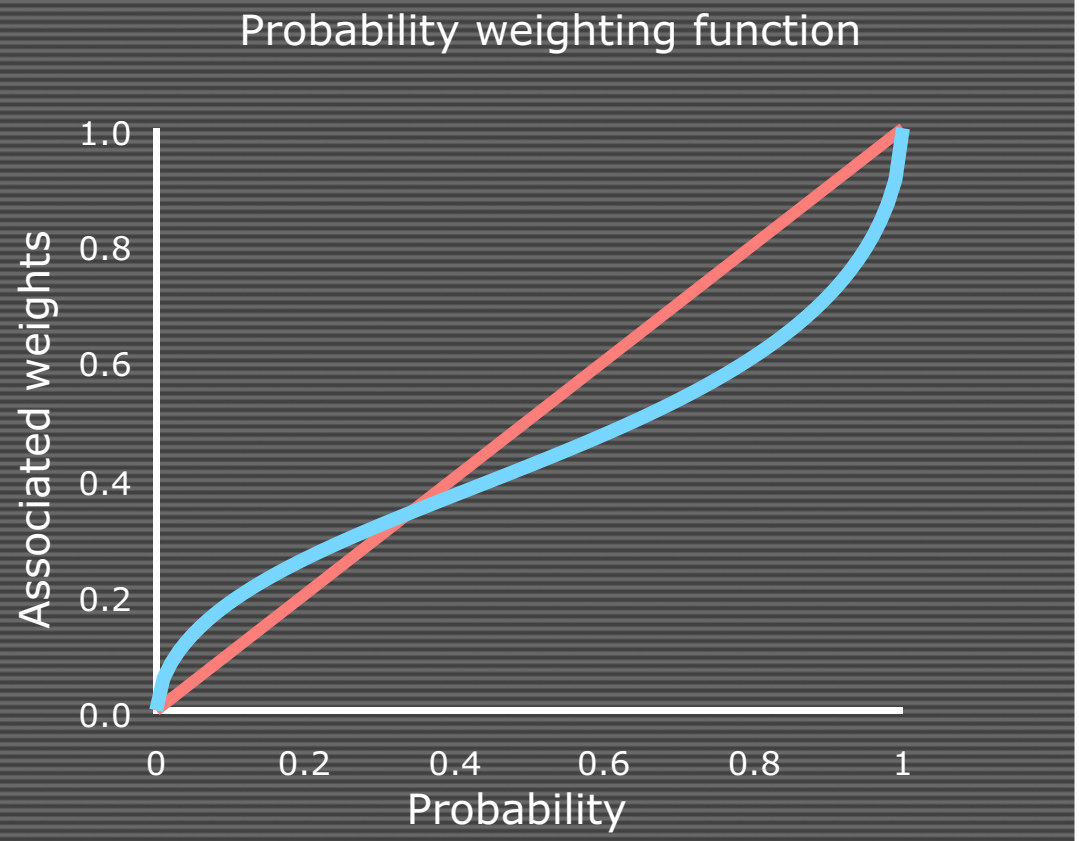
The probability weighting function


Probability weighting function
Associated weights
1.0
0.8
0.6
0.4
0.2
0.0
0
0.2
0.4
0.6
0.8
1
Probability

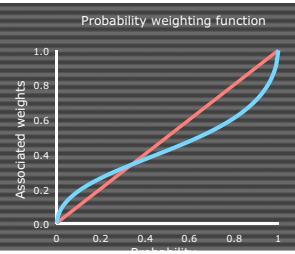
Probability is not linear



- What are some applications of this different pattern?



Lottery tickets



- I have 100 tickets. One of which will win $1,000.
  - How much would you pay for 1 ticket
  - If you had 49 tickets, how much would you pay for 1 more ticket
  - If you had 99 tickets, how much would you pay for 1 more ticket

The Allais paradox

Which would you prefer?

	$0	$1M	$5M
G1a		100%	
G1b	1%	89%	10%

G2b	89%	11%	0%
G2a	90%	0%	10%

The Allais paradox

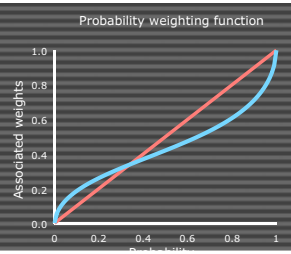
	$0	$1M	$5M
G1a		100%	
G1b	1%	89%	10%

	+1%	**-11%**	**+10%**

G2b	89%	11%	0%
G2a	90%	0%	10%

	+1%	**-11%**	**+10%**

Market mechanisms?



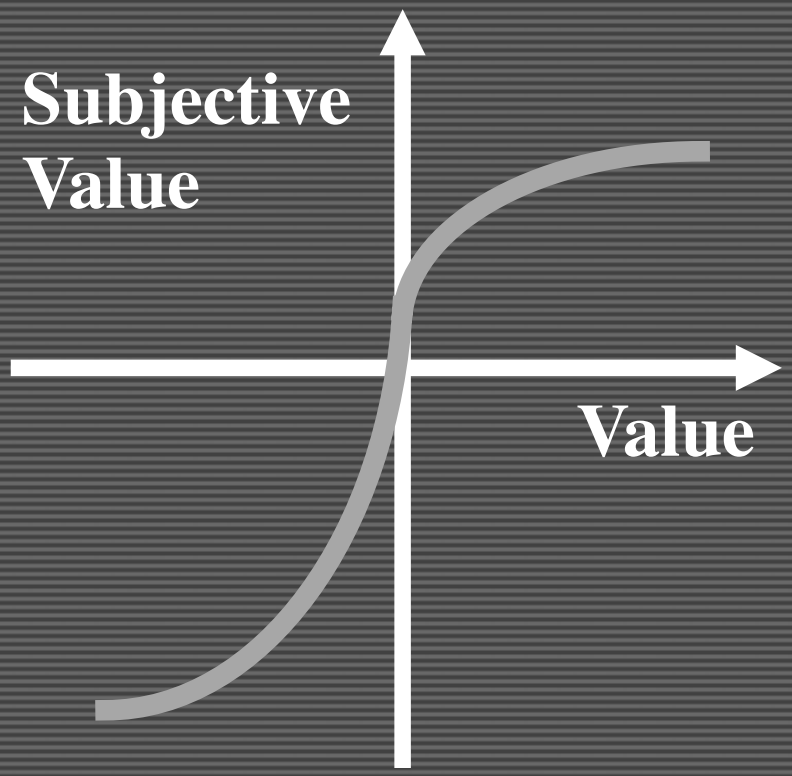
- What are some market mechanisms that use the shape of the probability weighting function?

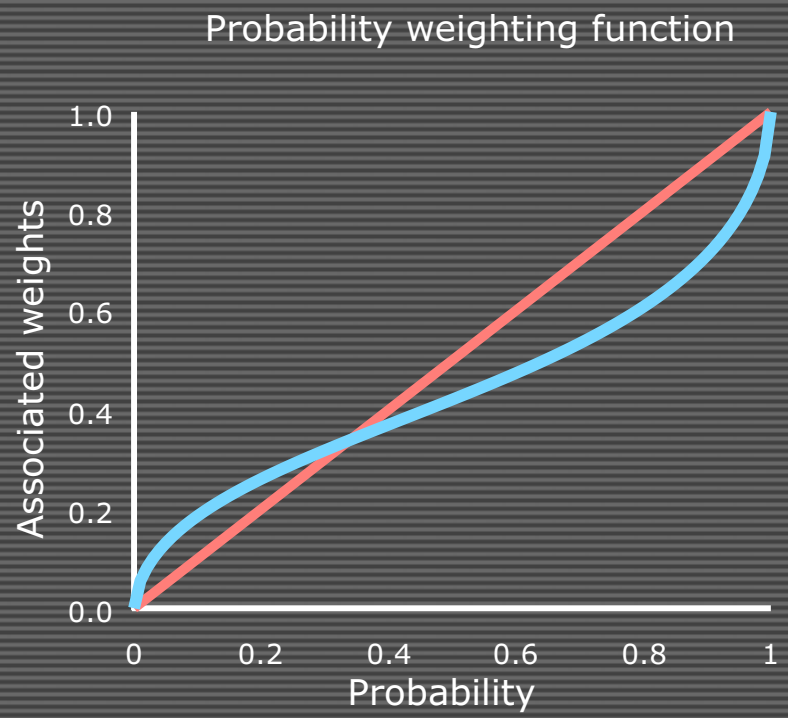
“Winning is crucial to my retirement plan”

Prospect theory summary

- 2 aspects:
  - The psychological value function
  - The probability weighting function

Prospect theory summary





Prospect theory summary

- The psychological value function
  - Diminishing returns
  - Loss aversion
  - Reference point
- The probability weighting function
  - Probability counts mostly at the two extremes

Behavioral economics: summary

- People behave in a way that is different from standard economics
- Sometimes we can model these behaviors and incorporate them into economics
- Prospect theory captures some of the differences in a simple form, and with many implications