

Prospect Theory in the Machina Triangle

Machina Triangle: Fanning Out Indifference Curves

- ▶ What do indifference curves for prospect theory look like in Machina triangle?
- ▶ Put Allais Paradox choices from earlier on the triangle:
 - A : Receive \$100 million for certain
 - B : 10% chance of \$500 million, 89% chance of \$100 million, 1% chance of no money
 - A' : 11% chance of \$100 million, 89% chance of no money
 - B' : 10% chance of \$500 million, 90% chance of no money
- ▶ Lines connecting A to B and A' to B' are parallel by construction
- ▶ Yet many people choose A over B but B' over A'
- ▶ Indifference curves must be *fanning out*

Evidence for Reference-Dependence and Loss Aversion

- ▶ We have already seen two key pieces of evidence for the reference dependence/loss aversion part of prospect theory
 - ▶ Lab evidence: Kahneman, Knetsch, and Thaler (1990) mug experiment
 - ▶ We did this with notebooks
 - ▶ Prospect theory can explain behavior known as *endowment effect*
 - ▶ Field evidence: Camerer et al (1997) taxi cabs
 - ▶ Shows that behavioral effects have large impact on real labor supply decisions
- ▶ What about evidence for probability weighting?

136 / 1

Evidence for Probability Weighting

- ▶ Tversky and Kahneman (1992) recruited 25 graduation students
- ▶ Paid fixed amount for participation (unincentivized choices)
- ▶ Decision problem
 - ▶ Shown a two-state gamble of the form $(p, x : 1 - p, 0)$ for various x and p
 - ▶ Asked to state dollar amount c that would make them indifferent between c for sure and gamble, ie the certainty equivalent
- ▶ What do we expect to find?
 - ▶ Utility of gamble is $\pi(p)u(x)$
 - ▶ By design of the experiment, $u(c(p)) = \pi(p)u(x)$
 - ▶ If we assume value function is linear:
- ▶ So plotting reported values of $\frac{c}{x}$ vs changing levels of p should return $\pi(p)$

137 / 1

Tversky and Kahneman (1992) Results

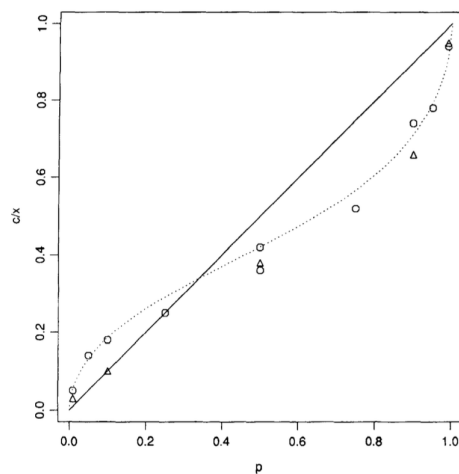


Figure 1. Median c/x for all positive prospects of the form $(x, p; 0, 1 - p)$. Triangles and circles, respectively, correspond to values of x that lie above or below 200.

138 / 1

Other Non-Expected Utility Theories

139 / 1

Expectations-Based Reference Dependence

- ▶ Recall our discussion of possible sources of reference point
 - ▶ Status quo wealth
 - ▶ Aspirational wealth level
 - ▶ Relation to others
 - ▶ **Expectations about future uncertain outcome**
- ▶ Expectations offer a possible way to “close” the model
- ▶ Leads to another reference-dependent model (different from prospect theory): disappointment aversion

140 / 1

Disappointment Aversion

- ▶ Idea: reference level of utility is utility of expected value
- ▶ Gamble $(p, X; 1 - p, Y)$ for $Y < X$
- ▶ Define certainty equivalent C_p by

$$u(C_p) = pu(X) + (1 - p)u(Y)$$

- ▶ Note this is defined in terms of the standard theory
- ▶ Then value function is consumption utility plus a disappointment term:

$$\tilde{u}(C|C_p) = u(C) + \mu[u(C) - u(C_p)]$$

- ▶ Finally, expected utility of whole gamble:

$$U = p\tilde{u}(C|C_p) + (1 - p)\tilde{u}(Y|C_p)$$

141 / 1