

AREC 815: Experimental and Behavioral Economics

**Incentives, Mistakes, and Stochastic Choice**

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Decision Errors

## Decision Errors

- Both EU and the main alternatives are deterministic
  - ▶ Most preferred alternative is always chosen
- Choice processes involve errors, stochastic components
  - ▶ Having subjects make the same choices multiple times (without realizing it) suggests “natural” error rates of 15–25 percent
- Theories of error:
  - ▶ “Trembles” which occur with fixed probability across all decision problems regardless of payoffs (cf. Harless-Camerer 1994)
  - ▶ “Fechner errors” or logit noise as described in Loomes (2005)

## Decision Errors: Loomes (2005)

Allais' common ratio paradox:

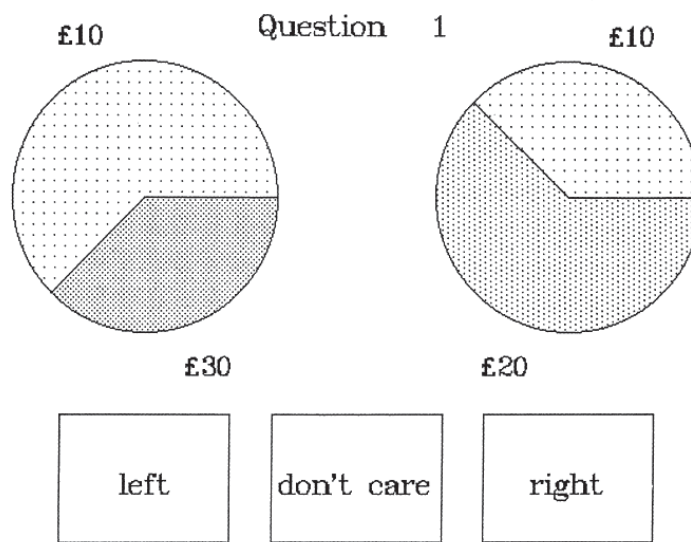
- Choice 1:
  - ▶ Option A: 100 percent chance of \$30
  - ▶ Option B: 75 percent chance of \$45, 25 percent chance of \$0
- Choice 2:
  - ▶ Option C: 20 percent chance of \$30, 80 percent chance of \$0
  - ▶ Option D: 15 percent chance of \$45, 85 percent chance of \$0
- Many people prefer both A and D
  - ▶ What would noise look like?

## Decision Errors: Loomes (2005)

	Option C	Option D	Total
Option A	47	28	75
Option B	7	18	25
Total	54	46	100

- If all trembles were equally likely and expected utility was the right model, we should observe as many AD pairs as BC pairs
- With Fechner errors, scaling down the payoff probabilities increases the likelihood of choosing a “less preferred” alternative
  - ▶ We should expect preference reversals of the Allais variety

## Comparing Models of Risky Choice



## Comparing Models of Risky Choice

- Hey-Orme (1994) estimate individual-level preference functionals
  - ▶ Risk neutrality, expected utility, many other variations
  - ▶ Assume L1 is chosen if  $U(L1) - U(L2) + \varepsilon > 0$
- Many of the more complicated models provide better fits for some subjects, but there is no clear winner among alternatives to EU
  - ▶ EU provides a good fit relative to degrees of freedom

## Comparing Models of Risky Choice

- Harless-Camerer (1994) conduct a closely related exercise
  - ▶ Pool data from several discrete choice experiments
  - ▶ Assume constant probability of trembles,  $\varepsilon$
  - ▶ Test: risk neutrality, expected utility, many other variations
- Distinguish theories at the “data frontier” from those that explain weakly less variation with weakly more parameters
  - ▶ Data frontier still highlights tradeoff between fit and parsimony
- Their conclusions, from most to least parsimonious:
  - ▶ EV, EU, PT, mixed fanning
  - ▶ EU does quite well when comparing lotteries with common support