Content

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1 Introduction

This course is designed to:

1. familiarize you with *what* models of decision making exist in economics, and
2. develop skills in *how* to model decision making.

2 Models

The following is the list of models we will analyze for the course:

1. k

3 Uncertainty

Most decisions we face on a day-to-day basis involve some degree of uncertainty. Whether that comes in which stock to invest in, what movie to watch, or what job to accept, the actual probability of each outcome is not known. Consider: when we discuss risk, everyone agrees on the probabilities; when discussing uncertainty, there is disagreement. That is, when analyzing someone's actions, we cannot make any statements *a priori* regarding their beliefs.

3.1 Resnick

3.2 Savage and SEU

3.3 Ellsberg

SEU cannot account for ambiguity aversion... so we will try to model it. One way is maxmin expected utility of Gilboa and Schmeidler (1989), where people do not have a single coherent belief but a *set* of beliefs. E.g., in the Ellsberg example, you can think that the probability that the ball is Black is in a range from . Assume the worst (pessimistic).

Formally:

$$V(f) = \min_{p \in C}[E_p(u(f))]$$

...horse-roulette.

$f = (s_1, l_1; s_2, l_2)$ where l_i is a lottery over monetary prizes.

Properties:

1. Rational (complete and transitive)

2. Independence:

$$\forall f, g, h \text{ and } \alpha \in (0,1), f \geq g \iff$$
$$\alpha f + (1-\alpha)h \geq \alpha g + (1-\alpha)h$$

   This should read: if act f is preferred to act g, then any mixture of f with a third act h should be preferred to the same mixture of g with h.

3. Non-Degeneracy, Continuity, Monotonicity

3.4 Karni

Awareness of unawareness...

Acts, mappings from known states to known consequences: A

Consequences we know are possible and can be clearly described: C

Unknown consequence, catch-all for "none-of-the-above": x

Extended consequences: $\hat{C} = C \cup \{x\}$

Augmented conceivable states: $\hat{C}^A := \{s : A \to \hat{C}\}$

Fully describable conceivable states: $C^A := \{s : A \to C\}$

Set of conceivable acts: $F := \{f : \hat{C}^A \to C\}$

Set of extended conceivable acts:

$$F^* := \{f^* : \hat{C}^A \to \hat{C} \mid f^{*-1}(x) \subseteq \hat{C}^A \setminus C^A\}$$

We consider lotteries over extended conceivable acts. Denote by $\Delta(F^*)$ the set of all probability distributions on F^*, and by $\Delta(F)$ its subset of all probability distributions on F. A generic element $\mu \in \Delta(F^*)$ selects an extended conceivable act in F^* according to the distribution μ.

Refer to elements of $\Delta(F^*)$ by the name *mixed extended conceivable acts*. The set $\Delta(F^*)$ of all such lotteries is the choice set.