Discussion of:

Bounded Institutions

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Federal Agency Decision-Making Under Deep Uncertainty
University of Chicago Law School
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Summary: bounded vs. unbounded institutions

Bounded institutions:
- Regulator decides on a “budget”
- Agents allocate the budget between cases
- Examples: NSF, grading on a curve

Unbounded institutions:
- No hard cap
- Regulator supplies a mission and, perhaps, rules leaving agents with discretion
- Examples: FEMA
Both institutions are attempts to solve the same problem: Make good use of decentralized information when agents may be biased or prone to error.

Bounded institutions work well when:

- Cases are homogenous
- Cases are numerous
- Agents are biased

Paper raises important questions and many ideas to reflect on ... but ..
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Deep Uncertainty: *the power of an idea*

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“The sense in which I am using the term [uncertainty] is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence, or the obsolescence of a new invention, or the position of private wealth-owners in the social system in 1970.”

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Responses to uncertainty

Common responses to deep uncertainty:

- Conventional theories of decision making under risk are inadequate under deep uncertainty
- Pessimistic decision-making criteria
- Worst case scenarios
- In regulatory context, the *Precautionary Principle*

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“Nevertheless, the necessity for action compels us to behave exactly as if we had behind us [...] prospective advantages and disadvantages, each multiplied by its appropriate probability, waiting to be summed.”

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Keynes was a Bayesian .. decades before the development of formal expected utility theory.
It is argued that the received interpretation of Knight’s classic risk-uncertainty distinction—as concerning whether or not agents have subjective probabilities—constitutes a misreading of Knight. On the contrary, Knight shared the modern view that agents can be assumed always to act as if they have subjective probabilities. We document our contention that by uncertainty Knight instead meant situations in which insurance markets collapse because of moral hazard or adverse selection. Knight’s discussion of market failure, although always informal and in places inaccurate, was in many respects a remarkable anticipation of the modern literature.
“What is to be done?”

- Something seems to be missing?
- Can one incorporate Knightian uncertainty and remain rational?
- What causes the wide perception that the two are irreconcilable?
Let me attempt an answer based on the assumed properties of the principle’s objectives.

- Details in forthcoming paper (JLS)
  “Bayesian Framework for the Precautionary Principle.”

Key point: the planner’s objective is an additive of outcomes.

By far the common practice in welfare economics.

Completely eliminate the impact of uncertainty.
Welfare criteria and bounded institutions

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**A. Model Setup**

There is one principal, one agent, and a finite number of subjects (*N*). The principal wants to take allocation actions, denoted by *α*, that are a function of the “quality” of the subjects. The quality of subject *i* ∈ *N* is denoted by *θi*. The principal cannot observe the subjects’ quality but knows the distribution of quality *f*(*θ*). Quality is independent and identically distributed (i.i.d.) The agent, by contrast, directly observes subject quality. (For much of what follows, I will assume that *θ* ∼ *U*[0, 1].)

The principal’s utility is $U_p(α, θ) = \sum_{i=1}^{N} - (a_i - θ_i)^2$.\(^{115}\)

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Why is this a problem?

If welfare as a function of individual outcomes has the form:

\[ v_1(s_1) + v_2(s_2) + \cdots + v_n(s_n) \]

If \( P \) is the distribution on profiles \((s_1, \ldots, s_n)\), then

\[ \text{Welfare} = E_P[v_1(s_1) + v_2(s_2) + \cdots + v_n(s_n)] \]

But this means that:

\[ \text{Welfare} = E_P v_1(s_1) + E_P v_2(s_2) + \cdots + E_P v_n(s_n) \]

Summing welfare across population and expectations commute

Any trace of uncertainty is eliminated; why?
Example of catastrophic risk

New medical procedure with outcomes:

\[ x: \text{Life (worth 1)} \]
\[ y: \text{Death! (worth 0)} \]

50/50 lottery over the constant profiles:

\[ \bar{x}: \text{Everyone lives} \]
\[ \bar{y}: \text{Everyone dies} \]

50/50 independent coins flipped for each individual

When \( n \) is large, this like half of the population gets \( x \) and half \( y \)

Very different outcomes! Yet the additive welfare criterion cannot tell them apart

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Concluding observations

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- Bounded vs. unbounded
- Rule-based decisions vs. complexity
- Subjectivity and disagreement in policy
- Fairness vs. hedging

The impact of uncertainty is anticipated and thoughtfully considered in this paper, but (understandably) the formal analysis of this case requires further work.

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