

How to Evaluate and Manage Risk When We Don't Know Probabilities

Yakov Ben-Haim

Yitzhak Moda'i Chair in Technology and Economics

Technion — Israel Institute of Technology

Haifa 32000 Israel

yakov@technion.ac.il

<http://www.technion.ac.il/yakov>

Abstract

Ignorance is **not** probabilistic, as we illustrate with a riddle.

We then discuss non-probabilistic **info-gap models of uncertainty**, which can be used to quantify severe lack of information. Info-gap models can be combined with fragmentary probabilistic information.

We then consider the strategy of **robust-satisficing**: choosing an action or policy which attempts to achieve adequate outcomes most reliably. We discuss the trade-off between quality of the outcome and confidence in attaining that outcome. High aspirations have low robustness to uncertainty; maximal aspirations have zero robustness.

Robust-satisficing is very different from optimization, which is the choice of an action to maximize outcomes. From our discussion of trade-offs we know that optimization is equivalent to minimizing robustness against uncertainty. Hence **optimization is an infeasible policy-selection strategy** when faced with severe uncertainty.