



IFAC/IFORS/IIASA/TIMS

The International Federation of Automatic Control
The International Federation of Operational Research Societies
The International Institute for Applied Systems Analysis
The Institute of Management Sciences

SUPPORT SYSTEMS FOR DECISION AND NEGOTIATION PROCESSES

Preprints of the IFAC/IFORS/IIASA/TIMS Workshop

Warsaw, Poland

June 24-26, 1992

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VOLUME 1:

Names of first authors: A-K

RISK OF EXTREME EVENTS AND THE FALLACY OF THE EXPECTED VALUE

Abstract

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Most, if actually not all, managerial decisions are characterized by (a) elements of risk, uncertainty, and inadequate information and (b) multiple, noncommensurate, competing, and often conflicting objectives. To manage risk, professionals must make an assessment of it. This is usually done by a process of its identification, quantification, and evaluation. Thus, the assessment and management of risk is essentially a synthesis and amalgamation of the empirical and the normative, the quantitative and the qualitative and the objective and the subjective efforts. This lecture will address the process of risk assessment and management, focusing on the trade-offs that must be made among all costs, benefits, and risks.

In the process of risk assessment, however, extreme catastrophic events are often underestimated and commensurated with other nonconsequential events. Managers and decisionmakers are most concerned with the risk associated with a specific case under consideration, and not with the likelihood of the average adverse outcomes that may result from all similar risk situations. In this sense, the expected value of risk, which has until recently dominated most risk analyses in the field, is not only inadequate, but can lead to fallacious results and interpretations. A modification of this approach through the use of conditional expectation will be shown to better capture the risk of extreme and catastrophic events. This paper will focus on the importance of addressing extreme and catastrophic events explicitly and within the overall risk-based decisionmaking process, where trade-offs among costs and risks can be generated and evaluated.

IBS Konf. Nr.

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