

Book Review

Economic and Environmental Risk and Uncertainty: New Models and Methods

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This book collects together papers by economists, management scientists and statisticians in the neo-classical economic tradition as presented at the seventh Foundations and Applications of Utility, Risk and Decision Theory Conference, 1994. Despite the book's title, and the fact that the conference theme was environmental risk, the topic is hardly covered. Out of the eighteen chapters there are only four related to the environment: two theoretical papers one each on enforcement and tradable permits, and two concerning environmental valuation of health and safety in transport. While Part I is entitled 'models of environmental risk', it includes a paper on medical decision-making, and the topic of risk seems absent from one of the transport chapters.

The most interesting and readable chapter is by Jones-Lee and Loomes. They address the theoretical and practical problems of trying to place a monetary value on health and safety, i.e. calculating the value of a statistical life. This cost-benefit approach to public policy generally advocates the use of direct elicitation of bids using the contingent valuation method. Reflecting upon their experience for the UK Department of Transport they document how use of the willingness to pay (WTP) and accept (WTA) approaches to obtaining 'individuals' "true" values', even accepting the need for confidence intervals to account for imprecision, 'proved to be seriously overoptimistic' (p. 6). Some of their reported problems and findings are: that the opening bid was found to have significant effects, questioning the existence of 'robust preferences' (p. 8); for over half the respondents the confidence intervals for individual WTP failed to overlap at all with those for WTA; that under WTA refusal to trade health risks for money, at any price, occurs; that differences between WTP and WTA can be rationalised in more intuitive and persuasive ways than attempts such as Hanemann's to reconcile them with standard preference theory (p. 10); and that WTP was insensitive to the magnitudes of risk reduction. These problems lead to the rejection of contingent valuation as the basis for policy recommendations to the Department of Transport and the use of a standard gamble (SG) procedure. In this SG procedure respondents showed their willingness to trade risks by either accepting the consequences of a car crash or undergoing a treatment which may prove fatal. Unfortunately the extent to which removal of the explicit monetary trade-off in the SG procedure was responsible for the success of the method was unclear. Interestingly the authors do go on to discuss wider issues, including the philosophy of basic values and the divergence of psychological models of behaviour from economic theory. Many interesting questions are raised, with relevance for environmental valuation and risk assessment, but unfortunately these are neglected in the rest of the book.

Wenstop and Carlsen claim that their approach to multi-criteria decision analysis is a step in the direction of making Robin Attfield's call for comprehensive weighting operational. They also claim a growing consensus that environmental and health impacts be equated to market goods via '*importance weights* (or prices)' (p. 53). Their favoured role for the economist is in avoiding 'haphazard political processes' by providing

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'decision makers' with tools for achieving consistency in the way they 'obtain values' (p. 54). Their tool is to use expert panels, which might include stakeholder groups, to advise democratically elected public servants (the empirical study reported used groups of three students in each panel). There is brief mention of the construction of preferences being at odds with contingent valuation but strangely no mention of the fuller discussion in the Jones-Lee and Loomes chapter. The process of eliciting weights for various public policy initiatives to reduce traffic-related health and safety impacts involves an implicit willingness to pay, but one related to public expenditures, not the individual's. Unfortunately the write-up is too brief and unclear to ascertain details of the process or what the participants believed they were actually doing. The rejection of over 26% of the 94 panels from the data set is also too briefly passed over. While the work seems to suggest departure from economic theory, this goes unexplored, as does the relationship to risk or uncertainty.

The other two environment-related chapters concern regulation. Romstad and Bergland use a principal agent model, propositions, proofs and lemmas to analyse the theoretical operation of a tradable permits market. Kilgour investigates enforcement of environmental regulations using a non-cooperative two person game. Some reflection on the wider context and relation to specific environmental problems would have helped both. In Kilgour's case reflecting on the work of Jones-Lee and Loomes might have cast doubt on the ability let alone the 'need to ensure that human choices take into account all of the consequential costs and benefits to current and future generations' (p. 33).

The other two parts of the book are stated to address risk and uncertainty in economic theory, and progress in modelling preferences and risk attitudes, respectively. These are both highly abstract, making extensive use of mathematics (e.g. calculus, set theory, lemmas and proofs) to the exclusion of written text. Both parts appear to be little different in theoretical preoccupation, addressing specific issues relating to expected utility theory and certain perturbations based upon it. Some of the papers explore non-expected utility theories, e.g. Allais theory, which were an interest of Ole Hagen, to whom the book is dedicated (although in the entire volume there is but one reference to his work).

In terms of the overall presentation of material the standard is poor. Extensive editorial revision is required to correct the variation between chapters which switch back and forth from endnotes to footnotes, have inconsistent general layout, different line spacing, font sizes and type faces, and abstracts for some chapters and not for others. There is no overall introductory chapter, no introduction to the three sections and no concluding chapter. Such a lack of editorial input and copy editing seems more unforgivable given the price.

In conclusion, this book has one very interesting chapter on health and safety which relates to broader aspects of environmental valuation and risk. The remaining contributions are largely excursions into theoretical neo-classical economic models unrelated to environmental risk or uncertainty. The chapters are poorly integrated and address abstract issues in utility theory in a self-contained fashion.

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