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Book reviews

Risk and Precaution, by Alan Randall. Published by Cambridge University Press, New York, USA, 2011, pp. viii + 260, ISBN 978-0-521-76615-9 (hbk), \$ 90.00.

While the concept of risk is widely accepted and well understood by agricultural and resource economists, in this book Alan Randall takes this somewhat standard concept and adds to it another dimension – precaution – something that is not as well appreciated as it should. Randall's book connects these two terms in a neoclassical manner, highlighting the need for precautionary action for risks, especially when these risks are coupled with high levels of radical uncertainty. Some of the more controversial aspects of the Precautionary Principle are successfully dispelled, and this concept is integrated into a formal risk management framework.

Randall's attention to detail and examination of the many concepts related to risk and precaution is extensive. All the key issues are addressed clearly and succinctly, and this book would be easily read and understood by economists and noneconomists alike. The use of examples is also comprehensive and allows the reader to grasp the central issues no matter what the background or interests of the reader.

Part 1 examines the key concepts risks, hazards and the Precautionary Principle. Randall points out that all decisions are associated with risk, and it is the degrees of the risks that allow us to trade-off our options and to adopt an optimally risky (and presumably most satisfactory) solution. It is also highlighted that it is not so much the mundane decisions (risky or otherwise) that really require the application of the Precautionary Principle but the extra-ordinary problems (such as climate change) where the alternatives are not balanced, i.e. some options may have standard risks while others are highly uncertain.

Background to standard risk management theory and practice is described in Part 2, clearly defining key terms such as harm, risk, threat and caution. Randall uses case studies to provide context to these terms and to allow the reader to associate, perhaps, more foreign concepts with more familiar ideas, such as the Hippocratic Oath and the Rivet Popper example.

The book clearly examines the current norms in risk management, or 'Ordinary Risk Management', and critiques the pros and cons of this framework with respect to more complicated systems where dynamics, hysteresis, resilience and irreversibility are real issues. The ways in which these types of problems are commonly addressed are also examined, and it is proposed that the Precautionary Principle would be useful in the development of a new risk management framework for complex risk problems.

An analysis, albeit brief, of the concept of radical uncertainty, integral to complex problems, is undertaken, and techniques for accounting for risk and

uncertainty are outlined. There is a lack of emphasis, both in Randall's book as well as in the wider literature, on the concept of radical uncertainty (or as Randall defines it 'ignorance'), which one would assume to be crucial to complex problems such as climate change, and is deeply ingrained in the concept of precaution. Randall himself admits that uncertainty is a confusing notion:

'If the reader is concerned that uncertainty seems a little mushy'... 'what follows will only heighten that concern' (p. 34).

Radical uncertainty (the chance that something bad might happen) is defined as 'threat', which is in turn interpreted as a chance of harm. Given the obvious complexities and debate surrounding the concept of uncertainty, this definition may be warranted, but it is, perhaps, somewhat restricting.

'These concepts – gross ignorance, unknown unknowns, and surprises – extend Knight's categorization of risk and uncertainty, providing a language for addressing cases where we cannot enumerate the possible outcomes. But why can't we? One obvious answer is that we do not know enough' (p. 34).

Part 3 examines the key criticisms of the Precautionary Principle from its apparent lack of meaning and clarity of definition and the sometime perceived lack of applicability, to its potential ability to stifle research and development, or indeed its use as a reason for inappropriate inaction on behalf of a decision maker. Randall carefully examines each of the principle's limitations and offers considered alternative views and solutions. Most importantly, the need to correct for the generalisations and misconceptions of the Precautionary Principle prior to integrating it into a workable framework is explicitly acknowledged.

Randall proposes designing a precautionary framework based on a premise of 'Evidence, Threat, Remedy'. The threats best considered are those which are extra-ordinary, disproportionate and asymmetric; of these, it is the unfamiliar, complex and large spatial or temporal problems that are the most likely to demand precaution. Contrary to popular belief, however, Randall does not believe that uncertainty or irreversibility is an essential characteristic of a threat warranting precautionary behaviour.

Evidence required should 'accurately reflect the state of scientific knowledge' (p 124), with a caveat that even the well informed may be surprised. Randall also acknowledges the disparity of the sources of risk information that should be considered. In citing the work of psychologists, he describes how risk aversion is different across groups in society and that some individuals are more likely to be risk averse and place too great an emphasis on harm that may result from new or emergent technology. Randall concludes that more work needs to be performed in taking public opinion into account when

designing and implementing policy; however, the reality is that doing so is neither easy nor feasible.

To 'remedy' the situation, Randall suggests focusing on three type of threats: new type of intervention *ex ante* (may propose a threat); new type of intervention *ex post* (has posed a threat); and the overstressed business-as-usual. Randall uses these three states to explain the reasons why and how taking precautionary steps is important to avoid having to overly mitigate, remediate and adapt – which may prove to be more limiting options than a precautionary response.

Further, and importantly, Randall highlights the need for learning from the situation, and the remedies employed, in order to update the policy decision should the precautionary response not be the best solution in retrospect. It is acknowledged that by implementing a precautionary remedy that may not in hindsight has been the best solution, the economic and social costs are likely to be substantial. As a solution, Randall proposes, in line with an Adaptive Management Framework, that his 'Evidence, Threat, Remedy' idea be implemented systematically and on a step-by-step basis for promoting learning and limiting up-front costs/commitments.

The use of precaution in policy is the focus of Part 4 and describes Randall's ideas for integrating the Precautionary Principle with Ordinary Risk Management in an integrated risk management framework allowing for use in real-world situations. A detailed selection of applications on risk management drawn from the USA, incorporating the idea of precaution, is presented. A point is further made that often there is a not as much emphasis on such cases as there should be.

Part 5 concludes by summarising the role for a clearly defined Precautionary Principle to be integrated within a risk management framework to overcome the limitations of stand-alone risk management approaches and to assist in decision making under threat.

Randall has suggested a novel conceptual framework for a Precautionary Principle, integrated with Ordinary Risk Management, which overcomes the major criticisms of the principle and makes a valid contribution to the decision-making literature. *Risk and Precaution* is not only highly deserving of our attention but an imperative read for anyone working on risk – or uncertainty-related problems in academia or policy, relevant to diverse applications as far reaching as the environment, agriculture, health, sciences or social issues.

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