

Study of Environmental Valuation and Decision Making under Uncertainty Aversion

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At the core of this study is the assertion that many decisions surrounding the environment are conditioned by the presence of “uncertainty”. And a central hypothesis of this study is that decision models based on risk and in particular the notion of probability cannot be expected to deal adequately with issues of environmental uncertainty, such as lack of scientific knowledge. In terms of the problem of global warming, there is the serious problem that the scientific knowledge is not available enough to cope with the problem. In such a case, under the lack of scientific knowledge, it is difficult to apply economic instruments, because environmental valuation is inevitably limited. Consequently it is inevitable that the decision-making under the Global Environmental problem is rooted in certain frames of judgment.

The research aims to provide a contribution in four main areas. First, an important step will be in developing criteria for defining the scientific methodology and uncertainty, and for assessing the implications of different modalities of uncertainty. Second, existing decision models, cost-benefit analysis and real option approach, cannot deal adequately with the situation under hard uncertainty. Third, this dissertation examines the problem of global warming by the new model, which takes into “uncertainty aversion”. The final contribution is the assessment of what decision making should be applied in context of dealing with non-divisible event.

It is identified the so-called “scientific uncertainty” as the hard version of uncertainty. show scientific uncertainty is essential in dealing with non-divisible event. Unfortunately most of existing global environmental problems have non-divisibility. So we cannot avoid the scientific uncertainty when we deal with environmental problems. Scientific uncertainty is interpreted in the context of Knightian uncertainty, which is termed “hard uncertainty”. Knight distinguished between a weak version of uncertainty, which they termed “risk” and a stronger version of uncertainty which they termed “uncertainty”. Recently the stronger version of uncertainty is termed hard uncertainty by Vercelli, the notion of which cannot be captured by probability. And in the recent research of this notion, the man under the hard uncertainty situation, show uncertainty aversion. People prefer risk situation to uncertainty situation.

This dissertation examines the decision-making under the lack of scientific knowledge through the Economic Model of Knightian uncertainty. The Model shows the decision makers or policy makers discount the cost of environmental loss. So, they cannot deal adequately with the environmental problems.

Conclusively, because the global environmental problems, such as global warming problem, have essentially non-divisibility, therefore even if they cannot act in terms of scientific methodology, they should act in terms of ethical judgment or political viewpoints. Non-divisible events, even if the arbitrary and no-cost negotiation is assumed, are not turned to be solved by the mechanism based on property right and to realize the minimization of social cost. Policy makers should not only wait until some future they can get the enough scientific knowledge, because citizens or companies are stressed from the ambiguous policy and confused. Therefore even if they cannot act in terms of scientific methodology, they should act in terms of ethical or political view points. In this sense, there is rationality about the recent fact some European countries have the difficult target suited with environmental standard. So far as non-divisible problem, any environmental policy is ban to involve judgment based on ethical values.