Economic valuation of environmental goods under Knightian uncertainty

Nadja Leschka and Stefan Baumgärtner*

University of Freiburg, Germany

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Abstract: Decision making in environment-economy systems, especially in relation to climate change, is characterized by deep uncertainties. We develop concepts for the economic valuation of welfare changes under *Knightian uncertainty*, where the probabilities of the potential states of nature are not known. Our setting consists of two goods: a market-traded consumption good and a non-market-traded environmental good. We provide ex-ante values in units of sure income for a change from one environmental-economic prospect to another. In analogy to risk, we derive the compensating and equivalent surplus, the uncertainty premium and the insurance value. We find that uncertainty aversion and substitutability between the consumption and the environmental good are key elements for decision making under uncertainty. Our research is relevant for cost-benefit analysis of projects with uncertain benefits or costs, e.g., adaptation to climate change.

Keywords: Knightian uncertainty, environmental goods, valuation, welfare measurement, willingness to pay

JEL-Classification: D81, Q51, Q54

*Correspondence: Chair of Environmental Economics and Resource Management, University of Freiburg, Stefan-Meier-Str. 76, D-79104 Freiburg, Germany, phone: +49 761 203-3753, email: stefan.baumgaertner@ere.uni-freiburg.de.