Economic Evaluation of Surge Disaster Risk Reduction under Uncertainty

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Abstract

Public support is required to implement adaptation policies for natural disaster risks. Prediction of natural disaster risk often includes uncertainty due to lack of knowledge on underling mechanism and insufficient data. Thus, the predicted risk are represented as a bundle of probability distributions. This study reveals public preference for high-tide disaster risk reduction under uncertainty with contingent valuation method. For that purpose, we implemented web-survey for residents in Osaka bay area. Typhoon and inundation simulations provide 25 surge risk curves as uncertainty in each respondent living area. In the survey, respondents are presented with two types of surge risk curves: average risk curve and worst risk curves among 25 risk curves. Then, we ask their willingness to pay (WTP) for eliminating high-tide inundation risks with hypothetical full-cover insurance. Applying a contraction model, a decision model under uncertainty, to survey data, we estimate respondent's attitude for uncertainty aversion. In addition, we evaluate how uncertainty aversion attitude affects WTP for high-tide risk reduction and examine how it relates with respondent socio-economic attributes.