

Uncertainty in climate economic modeling: Does time preference matter for rolling the DICE?

by

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Abstract: Climate economic models are increasingly used as input in the decision making on climate change mitigation. However, for these models huge uncertainty regarding several input parameters exist since the effect of these parameters on climate change is difficult to predict, estimate and value. This paper examines the effects on uncertainty about the pure time preference parameter on a climate economic model. As a novel contribution this study quantifies uncertainty of pure time preference as a combination of estimates from a descriptive and a prescriptive approach. The Dynamic Integrated Climate Economic model (DICE) by William Nordhaus is modified to a stochastic model by including uncertainty regarding pure time preference. Using Monte Carlo simulations, it is found that uncertainty regarding pure time preference affects the model results significantly. The effect of uncertainty increases with the time horizon due to feedback effects and lags in the model and drives the choice of mitigation efforts. An estimated 4.4 % of mean consumption could be lost by year 2100 due to uncertainty. Thus, overall, the results indicate that uncertainty of pure time preferences needs to be considered when designing climate change policy.

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