

Contribution of adaptation costs representation to climate change damage assessment

Patrice Dumas Ph.D. thesis summary

The purpose of this thesis is the improvement of climate change damage assessment by the mean of: the use of a threshold damage function and an evaluation of the costs of adapting to a changed climate. Simulation and optimization compact climate economy integrated assessment models are solved to assess the damages.

A stochastic threshold damage function leads to a precautionary effect for climate policies. In a cost-benefit framework, the threshold acts as a soft ceiling.

Turning to the representation of adaptation, adaptive capital is split in categories corresponding with temperature ranges in optimization models. In simulation, a Kalman filter is used to model climate change detection. The results show strong anticipations. Additional costs arise mainly from over-investment allowing to follow climate change. The costs are not very sensitive to the amount of uncertainty, but they rise sharply in the case of no anticipation.