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# Optimism, pessimism and climate change: mitigation and adaptation under strategic ambiguity

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## Résumé

In this paper, we analyze the effect of ambiguity and ambiguity attitudes on optimal mitigation and adaptation contributions when players hold ambiguous beliefs about their opponents' behavior and their preferences can be modeled using the Choquet expected utility with neo-additive capacities. We find that ambiguity attitudes do not impact the type of policy (mitigation or adaptation) chosen but they affect the amount contributed to these two policies. When players invest exclusively in mitigation, pessimists contribute more than optimists. When players choose both mitigation and adaptation, pessimists contribute more to mitigation, whereas optimists favor adaptation. Therefore, our results prove a dependence between equilibrium allocations and income distribution in presence of ambiguity. This dependence disappears once ambiguity vanishes. We investigate also the effect of two standard environmental policy instruments: taxes and standards, on mitigation policy. We find that in presence of ambiguity, the introduction of a non-binding standard can lead to a decrease in equilibrium contributions. For the introduction of a tax, we find that an increase in the tax rate results in an increase in total mitigation and therefore a decrease in the private consumption. For small degrees of ambiguity, the optimal tax rate increases in the collective degree of optimism. We then study the evolution of individuals types by analyzing the joint dynamics of wealth and environmental quality. Differently from the case of no ambiguity, the dynamics converge to a pareto-optimal allocation regardless of the initial condition.

**Mots-Clés:** Climate change, Mitigation, Adaptation, Ambiguity, pessimism, optimism, Choquet expected utility.

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