

Tying climate mitigation to risk sharing: towards better outcomes

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Abstract

One of the central challenges facing International Environmental Agreements (IEAs) is the persistent lack of incentives for countries to make ambitious climate pledges and to follow through on their implementation, largely due to the temptation to free-ride on the efforts of others. To address this, we propose a novel incentive mechanism that links participation in the mitigation agreement to enrolment in a risk-sharing (insurance) scheme. Under this mechanism, all countries that join the mitigation agreement contribute to a common pool, which is then used to compensate members for climate-related losses. Crucially, the compensation each country receives is conditional on its fulfilment of pledged mitigation actions.

We employ risk measure theory to model the strategic interactions in a climate mitigation game, where each country's loss distribution is shaped by the overall level of climate change. Our analysis demonstrates that, at the social planner's optimum, collective mitigation efforts exceed those achieved at the Nash equilibrium. Building on this, we introduce hybrid insurance-mitigation programs and identify conditions under which these arrangements are preferred to the Nash equilibrium. Within these preferred programs, countries not only achieve higher mitigation targets but also enjoy greater individual payoffs compared to outcomes under the Nash equilibrium, thanks to both risk-sharing and reduction of global climate-related risks.

Keywords: Climate risk, Climate insurance, Climate mitigation, Cooperative game theory, International Environmental Agreement

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