

Global Climate Change and The Equity-Efficiency Puzzle

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There is a broad consensus that the costs of abatement of global climate change can be reduced efficiently through the assignment of quota rights, and through international trade in these rights. But there is no consensus on whether the initial assignment of emission permits can affect the Pareto-optimal global level of abatement.

This paper provides some insight into the equity-efficiency puzzle. Qualitative results are obtained from a small-scale model, and then quantitative evidence of separability is obtained from MERGE, a multi-region integrated assessment model. It is shown that if all the costs of climate change can be expressed in terms of GDP losses, Pareto-efficient abatement strategies are independent of the initial allocation of emission rights. This is the case sometimes described as "market damages".

If, however, different regions assign different values to non-market damages such as species losses, different sharing rules may affect the Pareto-optimal level of greenhouse gas abatement. Separability may then be demonstrated only in specific cases (e.g.. identical welfare functions or quasi-linearity of preferences or small shares of wealth devoted to abatement).

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