Adaptation in the transboundary pollution dynamic game

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Abstract

This article studies a two-country transboundary pollution dynamic game in which countries can invest in a specific adaptation capital that decreases their individual level of damage caused by common pollution. In order to reveal the impact of country-specific adaptation, we compare the outcomes of the non-cooperative feedback Nash equilibrium and the cooperative joint welfare-maximizing equilibrium in three scenarios: (i) countries do not adapt, (ii) only one country adapts, and (iii) both countries adapt. The equilibrium solutions are numerically computed by value function iteration method. The results show that adaptation in one country leads to a decrease in the welfare of the other one when they act non-cooperatively. Moreover, the result that adaptation increases the long-run equilibrium levels of pollution and emissions, which has been shown in previous literature, is also verified in both non-cooperative and cooperative frameworks.