Sensitivity Analysis of Emission Markets: A Radner Equilibrium Approach

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Abstract

Emission markets, such as cap-and-trade schemes, play an important role in pollution reduction by incentivizing firms in terms of cost minimization.
However, such market structures are highly dependent on the decisions of policymakers such as pollution targets, and the availability of future abatement technologies which are not known in advance.
In this paper, we study the sensitivity of emission prices and firms' behavior to changes in key factors such as emission caps and abatement strategies in a Radner equilibrium framework that allows inter-temporal decision-making, uncertainty, and comprehensive assessment of the market dynamics and outcomes.
The findings of this study are important for policymakers to access and improve the design and effectiveness of emission trading systems in achieving their goals by understanding the dynamics and responses of market participants to various market conditions.

Keywords: Carbon price, Sensitivity analysis, Abatement cost, Radner equilibrium

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