Optimal Design of a Phase-in Emissions Trading Program with Voluntary Compliance Options

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Abstract

In this paper we explore the welfare implications of voluntary compliance within an emissions trading program and derive optimal permits allocations to affected and opt-in sources when the environmental regulator has incomplete information on individual unrestricted emissions and control costs. The regulator faces a trade-off between production efficiency (minimization of control costs) and information rent extraction (reduction of excess permits allocated to opt-in sources). The first-best equilibrium can be attained if the regulator can freely allocate permits to affected and opt-in sources; otherwise a second-best equilibrium is implemented. The latter is sensitive to uncertainty in control costs and benefits.

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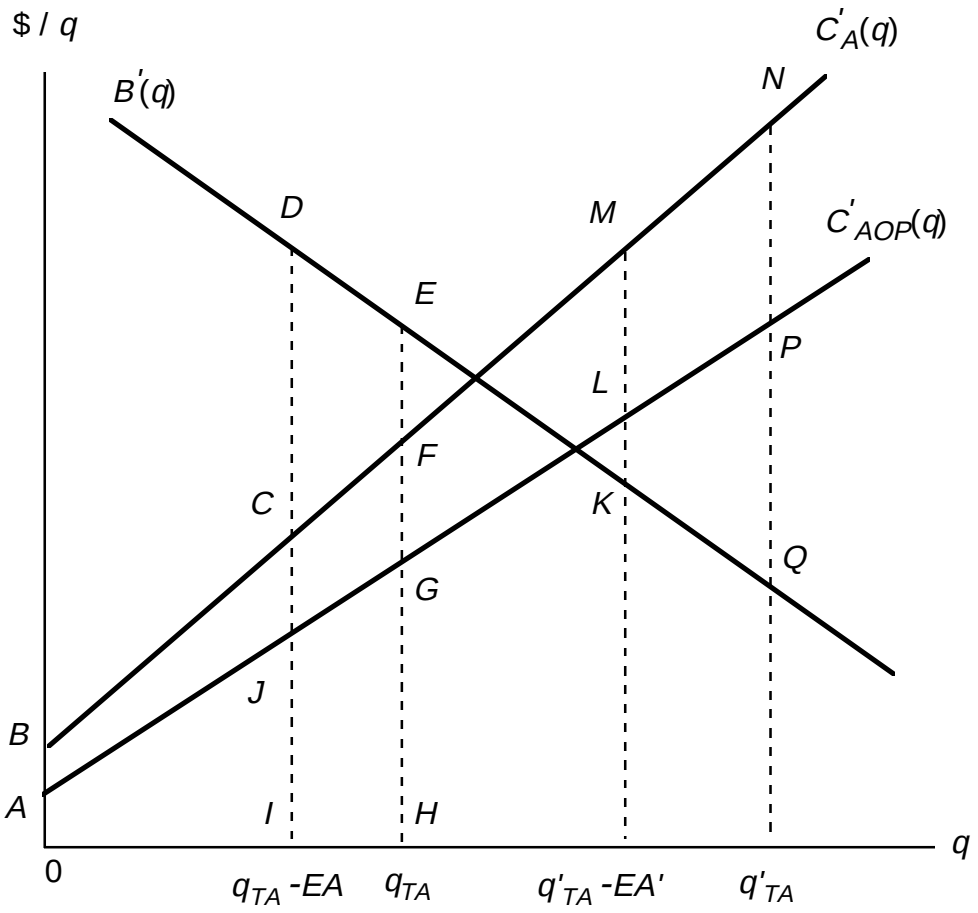

Figure 1. Net benefits from voluntary compliance

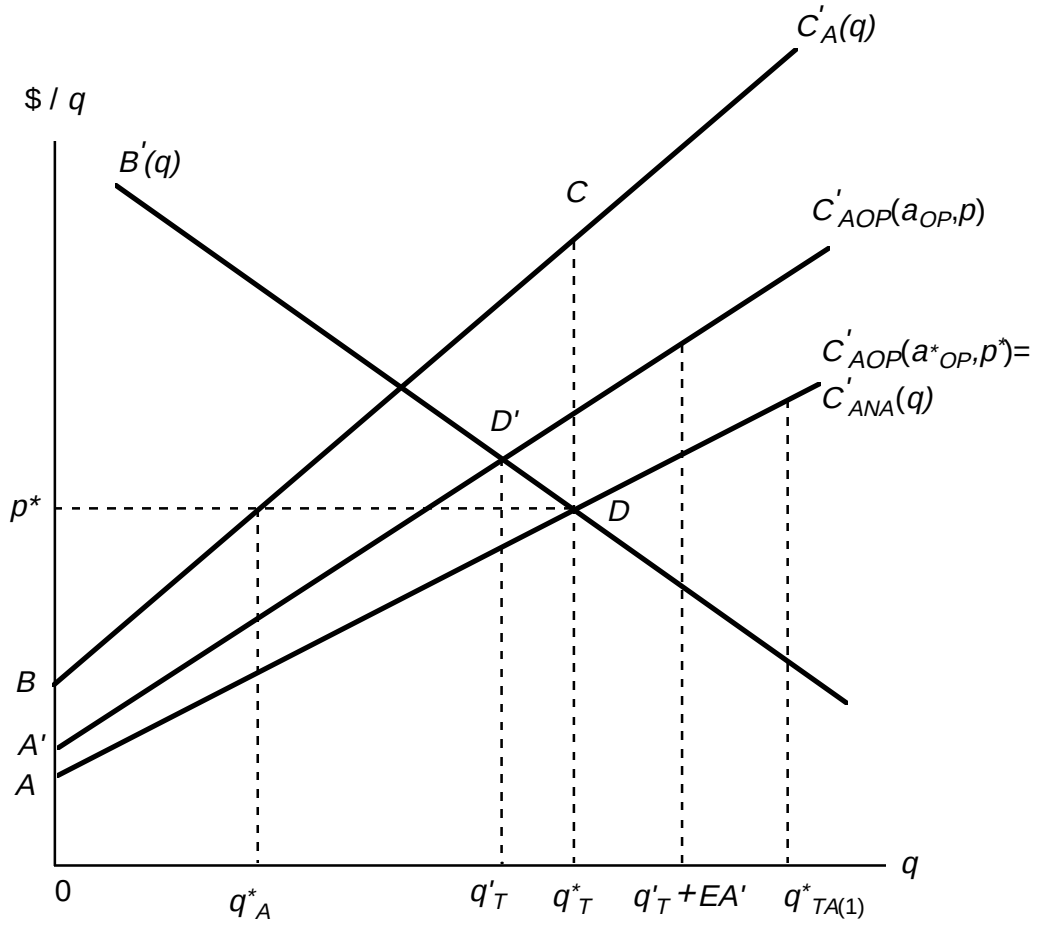

Figure 2. Optimal allocations for affected and opt-in sources

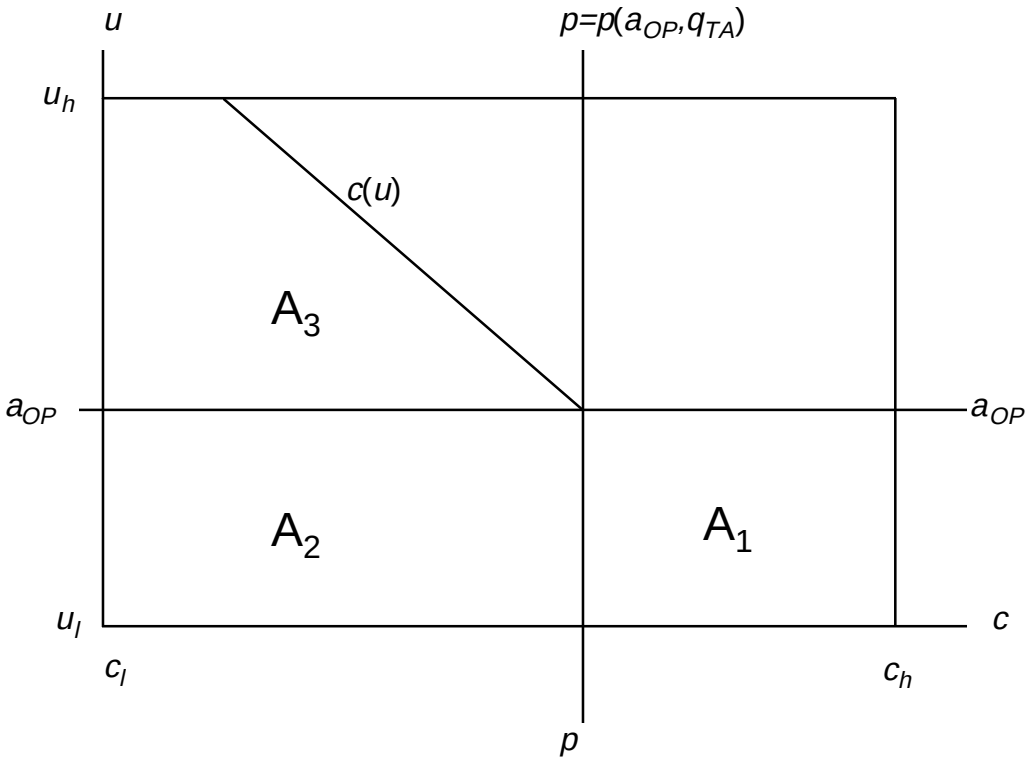

Figure 3. Likelihood of a non-affected source opting-in