

Hahn and Noll's Revenue Neutral Auction, Markets for transferable property rights and efficiency: a critique in a game theoretic framework

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ABSTRACT

Designing suitable organisations for trading transferable property rights has always been an interesting challenge for policy makers. The age-old prescriptions of theory in favor of the development of perfectly competitive markets for efficient exchange of permits are not applicable in most of the real situations. Suggestions have come in terms of alternative arrangements like auctioning of rights for an efficient reallocation. The purpose of the present paper is to explore the theoretical properties of a new mechanism, a revenue neutral auction proposed by Hahn and Noll, one version of which has been used in the environmental management program of the EPA in the U.S, and test its efficacy theoretically. The main focus is on critically assessing Hahn and Noll's suggestions in a game theoretic framework. Our model addresses the problem of pollution control in an economy which quantifies pollution levels in terms of permits, distributes them free to the polluters initially and provides for better reallocation among the polluters through a revenue neutral auction. This mechanism is one version of the second price auction formulated by Vickrey with a refund scheme that redistributes back the revenue to the initial holder of the permit following a specified rule. Our model captures the trade-off between the political viability and efficiency of a mechanism. In a single unit case the model derives the necessary and sufficient conditions for efficiency.

Our findings alter those suggested by the perfectly competitive model (Montgomery, JET 1972) and conclude that the efficiency of the system depends on the initial distribution of permits. The model also shows that a system with free initial distribution and revenue neutral auction as the mode of exchange of rights, if efficient, is equivalent to a quantitative restriction regime.