

The Instruments of International Environmental Policy
– Two “Counter-Intuitive” Results –
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Abstract

Economic analysis of environmental policy instruments is rooted in a most simple theory of governmental regulation in the presence of externalities:

A welfare maximizing government diagnoses a divergence between social optimum and market equilibrium. It then makes amends by applying means of internalisation.

Of course, this fundamental approach has been modified in a number of respects, using approaches of public choice, information economics etc..

In this paper the following modification is investigated:

Regarding international environmental problems the concept of a central agency designing and enforcing environmental policy is particularly inappropriate. Here, policies have to be negotiated by sovereign countries.

The question is, whether the traditional economic recommendations regarding the choice of environmental policy instruments, as derived from the theory of regulation, are still valid if transferred to the international arena. In the paper at hand this issue is analyzed using the "environmental economics folk theorem" maintaining that effluent charges are superior to non-tradable emission quotas. (In a survey by Alston, Kearl and Vaughn published in the American Economic Review, May 1992, pp. 203-209, 78 % of the economists interviewed, agreed to this statement.)

Probably, the superiority of efficient environmental policy instruments (e.g., effluent charges) is unchallenged in the international arena if countries negotiate in a Coasean world with zero transaction costs. In the paper at hand, the framework for negotiations, however, is set in a more "down to earth" manner.

Two kinds of transaction costs are incorporated in the model:

1. Economic institutions needed for international environmental negotiations are assumed to be imperfect. E.g., countries are unable to design and to enforce optimal compensation schemes.
2. Scientific knowledge is supposed to be imperfect. E.g., countries cannot exactly quantify the damage reducing effect of protective measures. Only a probability distribution is assumed to be known.

It is shown that in this second best setting the use of inefficient environmental policy instruments (e.g., non-tradable quotas) may be welfare superior to efficient instruments.

In case 1., the "counter-intuitive" result is due to the fact that under certain conditions equilibrium emissions under the quota regime can be shown to be closer to socially optimal emissions than equilibrium emissions under the tax regime. In terms of social welfare, this "quantity effect" may overcompensate the advantage in terms of efficiency that taxes hold over quotas.

In case 2., the "counter-intuitive" result is due to the fact that countries play different kinds of games negotiating quotas versus negotiating taxes. It can be shown that under certain conditions taxes constitute a dilemma game and quotas constitute a no conflict game. Then,

the cooperative equilibrium under quotas may be welfare superior to the non-cooperative equilibrium under taxes.