An economic perspective on instrument combinations

Stephen Smith[1]

[1]University College London, UK, stephen.smith@ucl.ac.uk

This paper draws on joint work between the author and Vidar Christiansen (University of Oslo), which aims to develop more extensive theoretical underpinnings for the combined use of environmental policy instruments. The paper will provide a non-technical review of this work, and its place in relation to other existing literature on the economics of instrument combinations, with the aim of contributing to an interdisciplinary discussion of policy implications.

Most economic analysis of policy instruments to address environmental and conservation policy objectives has considered instruments as alternatives, and has focussed on the relative merits of using one instrument or another. Many economists stress the efficiency advantages of "market mechanisms" such as emissions taxes or tradeable pollution permits compared with direct "command-and-control" regulation. Where polluters differ in costs of abatement, the flexibility offered by market mechanisms can reduce the aggregate cost of achieving a given reduction in emissions. This argument is, however, underpinned by implicit assumptions about instrument imperfection. Under conditions of full information, costless implementation and certainty, an equivalent first-best outcome could be achieved equally well by either command-and-control regulation or a market mechanism.

Information costs and asymmetries are therefore central to the instrument choice debate. Regulated firms have little reason to reveal information about their abatement costs to the regulator, who may then compelled to treat firms the same when in fact they differ. Likewise, the operating costs of market mechanisms such as emissions taxes may influence the design of such instruments. Often it may be cheaper to tax emission proxies (such as the use of a particular input) than to tax measured emissions.

The upshot is that, in practice, policy must employ instruments characterised by various practical compromises. None of the available instruments is alone capable of implementing the first-best. It remains an interesting question to ask which instrument gets closer to the first-best. But if both are sufficiently imperfect, we may also be interested in the properties of instrument combinations, in which two instruments are used to offset each others' weaknesses. This aspect is the main focus of the work discussed in this paper.

We seek to characterize the circumstances in which combinations of tax and regulation may be required for efficient correction of some simple consumption externality problems under conditions of certainty, and to consider the interactions between the two instruments. We consider cases where the tax instrument is limited, in that it cannot differentiate efficiently between activities generating different levels of externality. For example, a tax on motor fuel cannot differentiate between fuel used to drive in congested road-space and fuel used for journeys which do not add to traffic congestion. We consider situations where the available tax instruments can be supplemented with some form of direct regulation which is, likewise, imperfect. We derive results showing the optimal combination of direct

regulation with the imperfect externality tax, and consider how changes in the scale of direct regulation alter the optimal externality tax.