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## PUBLIC POLICY ON CATTLE TICK CONTROL IN NEW SOUTH WALES: COMMENT

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The current policy of the New South Wales Government of subsidizing inputs for tick control out of consolidated revenue funds has recently been criticized in this *Review* by Johnston [4]. He states that a preferable policy on the grounds of both equity *and* economic efficiency would be the levying of charges on the beneficiaries of any tick control programme in proportion to the extent to which they benefit [4, p. 18]. For affirmation of this statement he quotes the "Green Paper" [3, 5.214], which appeals to the "rationality and equity" of such a financing system.

The purpose of this note is to point out that whilst it may be possible to make out a case on equity grounds in support of taxing the beneficiaries, such a policy cannot be supported on the grounds of economic efficiency. This follows given the usual assumptions of perfect competition, for example [4, p. 22]. Indeed it can be argued that the present New South Wales policy is the correct one.

The proposition may be justified using the analysis of Baumol and Oates [1, 2]. They consider the case in which as a result of a large number of production processes a good is produced which contributes to a total benefit which confers benefits not only on the original producer but also on neighbouring producers. A general equilibrium model is formulated, relying on the usual assumptions of perfect competition required for attaining Pareto optimality through the market system. If the total benefit is in the nature of a public good (termed an undepletable externality) then the recipients of the beneficial externality should not be charged for the benefit they receive in order to ensure Pareto optimality. The result can be explained by the fact that one additional person benefiting from the good does not reduce the benefits sustained by the others. The opportunity cost of an additional person's benefiting is zero, and therefore there should be no charge for the benefit.

The result may be applied to the tick control problem. The assumptions of perfect competition and the standard concavity-convexity conditions do not hold throughout the economy, but they may hold tolerably well for the livestock sector. Johnston is quite clear that the externality is the undepletable type [4, p. 8]. In this case for a Pareto improvement, the beneficial effects of tick control activity should be subsidized at a rate equal to the marginal social benefit when the effects are at their socially optimal level. That is, a Pigouvian subsidy should be

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implemented, paid for by lump-sum taxes, or out of consolidated revenue as an approximation to lump-sum taxes. Such a conclusion follows to the extent that second-best considerations do not intervene.

Baumol and Oates would argue that the optimal subsidy rate could not be calculated in practice. As a more practical alternative they would advocate the subsidizing of the effects of the tick control activity, initially at a fairly arbitrary rate in order to observe the effect on the tick problem. The subsidy rate would then be adjusted until the tick problem was reduced to some defined socially acceptable level. Given the difficulty of calculating the beneficial effect of control activity subsidies would have to be paid on input usage rather than on the effect of input usage, although such a policy would be suboptimal to the extent that measures other than input controls could be used to reduce the tick problem. In a world of certainty this would be the least-cost method of control. The uncertainty of the effects of input controls in practice suggests that some mixed policy of input controls and regulations would be optimal (*see* [2, Chs 10 and 11]).

The main point is that given the public-good nature of the externality resulting from tick control, economic theory does not suggest any obvious reason as to why taxing the beneficiaries of any control scheme should increase economic efficiency.

## REFERENCES

- [1] BAUMOL, W. J., "On Taxation and Control of Externalities", *American Economic Review*, Volume 62 (1972), pp. 307-322.
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