POLLUTION AND RESOURCE ALLOCATION: COMMENT*

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In a recent article in this journal, Chisholm, Walsh and Brennan [1] discuss a conceptual framework and some policy principles for pollution control. They conclude that . . .

> '. . . in general, fiscal instruments (taxes and subsidies) are a more efficient means of controlling pollution than the widespread use of regulations or other legal instruments' [1, p. 1].

The authors argue that 'market failure' in solving pollution problems occurs because of the existence of externalities. Administrative solutions through fiscal or regulatory measures are therefore examined since these may be main policy intruments for pollution control.

My principal difference with the authors concerns the generality of the approach used rather than the substance of the above conclusion. Briefly, the authors use a model in which there are two commodities, physical products and 'clean environment'. These two products are generally regarded as substitutes; it is not possible to have more of one without less of the other.[1] This model places emphasis on controlling pollution at the source, i.e. in the production process, thus ignoring the possibility of control at a subsequent point, namely after the consumption activity. Elaboration of this point may cast some light on the issue of market failure in resolving the pollution issue.

Physical products and their associated wastes may be viewed as joint products. Some wastes are separated from products during the production process; these might be called production wastes. An important class of wastes is inseparable from products until after the act of consumption; these may be called consumption wastes. I have made the above distinction because the article by Chisholm, Walsh and Brennan concentrates on pollution control at the production stage, thus ignoring consumption wastes.

The authors point out that pollution results from consumer demand for physical products [1, p. 4]. Lancaster [3] suggests that consumers demand products for their want satisfying characteristics rather than simply demanding physical products *per se*. Consumption wastes are a subset of product characteristics not normally considered in analyses of consumer demand, but which should be considered in dealing with waste disposal and the associated externalities. With rises in income consumer demand for convenience factors and services (particular characteristics of products) rises faster than the demand for other product

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[1] The authors do recognize the possibility of complementarity between physical production and 'clean environment', but this is mentioned only incidentally [1, p. 5] and is ignored in the discussion of policy alternatives.

characteristics. Consumption wastes, therefore, assume increasing importance in what has come to be known as the 'effluent society'.[2]

Chisholm, Walsh and Brennan's emphasis on pollution control at the production stage results in a failure to consider a market solution through resource recovery (or recycling). Recycling should be given explicit treatment because of its unique position in relation to the production of both physical commodities and 'clean environment'. Resource recovery may be complementary with production of physical commodities as wastes are a potential source of secondary inputs to production activities. In the future, with further depletion of primary resources and rises in costs of exploitation,[3] resource recovery may become a more economically attractive source of raw materials for production. There may also be a complementarity between resource recovery and the production of the product clean environment. This double complementarity situation must take account of the law of Conservation of Mass [1, p. 3] and, in fact, resource recovery may imply a more efficient use of residuals. The attraction of resource recovery is its potential to simultaneously conserve scarce primary resources and reduce the adverse environmental effects of the disposal of wastes.

The development of an economically viable recycling industry is necessary before resource recovery can fulfil the role suggested above. Such a development depends upon a number of market determined factors. The supply of input products in the waste stream is an important factor and results of a study in the U.S.A. [4] indicate that large quantities of potentially valuable raw materials are discarded in the household consumption waste stream. Technological developments have occurred in the mechanical separation of mixed household wastes which are making such wastes an economic source of raw materials relative to reserves of primary resources. The demand for recycled inputs is related to the supply and price of primary resources, and the substitutability between primary and secondary inputs.[4]

In the case of consumption wastes and many production wastes, recycling represents a market solution to the pollution problem. As suggested above, the development of recycling will only occur in profitable circumstances which are created by factors other than the level of pollution. Environmental constraints are generally determined politically (or administratively) and it is not surprising that there is a divergence between the market and the administrative solution. This distinction between a market and an administrative solution may, however, be misleading since any administrative solution (fiscal or regulatory) inevitably affects market solutions by altering the circumstances in which the market operates. The critical question for policy principles then becomes one of recognizing the interaction of both fiscal and/or regulatory measures and the market place in our approach to environmental problems. The allocative effects of any combination of

[2] Existing waste disposal systems have been shown empirically to have important external effects [2].

[3] This may be due, for example, to the necessity for exploiting lower quality reserves of raw materials.

[4] Wastes with a high primary resource price are extensively recovered through recycling; the precious and semi-precious metals as well as copper and uranium are already recycled. Aluminium, oil and iron are also possible candidates for increases in recycling.

policies will not be clear unless this interaction is recognized, and most certainly depends on the particular mix of policies and market responses. In any case, it is questionable whether any statements about resource allocation can be distilled from a discussion of policy *principles*, particularly when this discussion involves pollution control solely at its source in the production stage of economic activity.

In summary, it appears that the use of a two-product model and the pre-occupation of the authors with pollution control at the source, result in an unnecessarily restrictive framework for discussing the principles of pollution control policy. The role of the market system in the context of fiscal and/or regulatory measures is not adequately considered, particularly with regard to recycling. The market system already recycles wastes in profitable circumstances. Allowing for the social costs of pollution and the value of inputs recovered, recycling may represent a relevant policy alternative. At least it should be considered in the evaluation of policy principles dealing with pollution and resource allocation.

References

[1] Tony Chisholm, Cliff Walsh and Geoffrey Brennan, 'Pollution and Resource Allocation', *Australian Journal of Agricultural Economics*, Vol. 18, No. 1, April 1974.

[2] Joseph Havlicek, Jr., Robert Richardson and Lloyd Davies, *Measuring the Impacts of Solid Waste Disposal Site Location on Property Values*, paper presented to the American Agricultural Economics Association Annual Meeting, August 15-18 1971.

[3] Lancaster, K. J., 'A New Approach to Consumer Theory', *The Journal of Political Economy*, Vol. LXXIV, No. 3, April 1966.

[4] Richardson, R. A. and J. Havlicek, Jr., *An Analysis of the Generation of Household Solid Wastes from Consumption*. Purdue University Agricultural Experiment Station Research Bulletin No. 5060, March 1975.