

Pigovian Taxes and "Full" Property Rights

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Two divergent theories of social cost currently exist—the traditional Pigovian analysis and the more recent property-rights approach. In spite of their differences, both would require agents to internalize the effects of their actions. This paper summarizes the current debate and then presents three propositions to suggest that the Pigovian analysis is a special case of the more general property-rights approach. The first shows that the Pigovian approach is consistent with Coase's Theorem in that it allows no a priori assignment of rights or liabilities. The second proposition implies that when property rights are fully defined to include the income derivable from the property, the Pigovian tax involves the assignment of property rights. The third proposition states that other proposed solutions to externalities (such as pollution standards) imply the assignment of property rights, and that the choice of the property right to be assigned depends on relative costs. This paper will conclude with a generalization based on Turvey (1972), that no general prescription is available to handle all external effects other than cost minimization.

THE CURRENT DEBATE

While earlier writers had observed the possibility of divergence between private and net social product, A. C. Pigou (1928) is usually credited with the identification of the concept of social cost. He suggested that a tax (subsidy) on the negative (positive) effects of private economic acts is the proper way to force equation of private and social costs, in order to reach a Pareto-optimal allocation. This policy forms the basis for what Coase (1960, p. 39) calls the Pigovian tradition.

It is Pigou's failure to consider transaction costs that leads Coase to suggest that the tax (subsidy) schemes of Pigou "proceed in terms of a comparison between a state of *laissez-faire* and some kind of ideal [zero transaction cost] world" (1960, p. 43).¹ Coase shows that in the absence of transaction costs, the same allocation of resources results no matter to which of the parties liability is assigned (1960, pp. 42-44). While this is an important conclusion, the primary significance of Coase's paper is that it motivated the discussion of transaction costs and their implications for theories of social cost.

Whereas Coase points out that the existence of transaction costs undermines the simple tax-subsidy schemes, Dahlman (1979) argues that transaction costs cannot possibly generate any Pareto-relevant externalities.² He describes two general equilibrium models: one without externalities (Model I) and another into which externalities are introduced (Model II). The Pigovian conclusion that private markets will not internalize all the effects of production

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(consumption) activity follows from the fact that the allocation in Model II is different from Model I. Therefore, Dahlman noted, Pigovian policy guides for government action rest on the implicit and logically fallacious comparison of a world with transaction costs to one of zero transaction costs.

To save us from the Panglossian "if it exists it must be optimal" world of correctly stated Pigovian analysis, Dahlman suggests that the solution lies in Coase's theorem properly applied. He believes that the important and often overlooked conclusion of Coase's work is "that when there are transaction costs and informational differences between traders, then it may very well matter to whom liabilities and rights are assigned" (1979, p. 158). Thus, the existence of transaction costs will affect the relative cost of assigning rights to competing interests.³

THE PROPOSITION

This section presents three propositions that imply that the Pigovian taxes are a special case of the more general property-rights approach. In order to demonstrate the first proposition, the absence of implied liability in the Pigovian approach, it is useful to discuss these issues in the context of the familiar Samuelson conditions.⁴ That is:

$$(1) \quad \sum_{i=2}^N MRS_{x,y_i}^i + MRS_{x,y_1}^1 = MRT_{xy}$$

Here the MRS_{x,y_i}^i is the marginal rate of substitution in consumption (for the i th individual) between a pure private good (x) and a rival good (y) with consumptive externalities consumed by individual 1 only. MRT_{xy} is the marginal rate of product transformation between goods x and y . Clearly, the $\sum MRS_{x,y_i}^i$ is positive (negative) when the consumption of y by individual 1 results in a positive (negative) externality.

For a negative externality the magnitude of the $\sum MRS_{x,y_i}^i$ measures either:

1. the amount of x that society is willing to give up in order to reduce individual 1's consumption of y by one unit, or
2. the amount of x that society is willing to take in exchange for allowing individual 1 to consume an additional unit of y .

Thus, $\sum MRS_{x,y_i}^i$ measures the degree to which the consumptive effects of y_1 are exclusive to individual 1, but it does not assign rights or liabilities.

Hence, the observation of consumptive externalities (as in Coase's Theorem) does not provide an *a priori* policy guide. The interesting questions become the following. First, is it efficient to assign a formal right or liability to all? Secondly, how are the rights and liabilities to be assigned?

To address the first question, note that it is difficult to conceive of any individual consumption that does not have some physical or psychological effect on some other individual. But, for the majority of consumer goods, little thought is given to the formal delineation of rights or liabilities. Efficiency requires that the benefit of property right assignment be greater than or equal to the cost of assignment, since the institutional and legal resources used to assign property rights are scarce. If we concentrate on the market as the only system of exchange, we will arrive at the "If it exists it must be optimal" conclusion. However, Buchanan suggests that to develop fruitful analyses of external effects we must study not only the market but "the whole system of exchange relationships" (1964, p. 220).⁵

It is in Buchanan's framework that we can attempt to address the issue of market failure.

One solution to market failure is to transfer to the government, at least at some ultimate constitutional level, property rights in the resource about which conflicts exist between individual behavior and mutually desired collective outcomes. Buchanan (1979, pp. 58-60) argues that, instead of asserting a specific allocation as preferred, as a basis for corrective measures to reach this allocation, efficiency should be defined as the absence of further gains from trade, including those gains achieved by transferring rights to the government through constitutional change.

It is in this framework that we address the second question and demonstrate the proposition that Pigovian taxes are property rights. The issue can be clarified by re-evaluating our definition of property rights. To say that an economic actor has a "full" property right to a certain good implies three conditions.⁶ First, it implies the right to the exclusive use of the property, as the owner sees fit. Secondly, it implies the right to the income derived from the property. Finally, a "full" property right implies the right to transfer the property.⁷

It is the second characteristic of a property right, the income derivable from the property, that implies the proposition that Pigovian taxes can be viewed as involving the assignment of property rights via the constitution. Normally a system of property rights is conceived to govern voluntary exchange in private markets. However, within Buchanan's constitutional political economy framework, property rights can efficiently be transferred to the government through a social contract. This broader view of property rights demonstrates that the imposition of a Pigovian air pollution tax, for example, is the restriction of a private agent's property right, and reciprocally, the assignment of a property right to the tax-collecting agency. That is, the polluter no longer has an exclusive right to the income derived from polluting the air. The government becomes a part owner of the air, sharing the return to the use of the air as a productive factor through the marginal tax.⁸ Thus, a Pigovian tax is a property rights solution to external effects that concentrates primarily on the income characteristic of property.

The above conception of "full" property rights also implies the third proposition, that other solutions to externalities involve the assignment of property rights. For example, a pollution standard is also a property right: the right to the use of a restricted quantity of air or water. Thus, standards restrict the exclusive use characteristic of a property right. When transaction costs are crucial to the choice of rights and liabilities to be assigned, standards can not be considered inefficient *a priori*, as the cost of assignment and enforcement must be considered. Therefore, Pigovian effluent taxes and fixed standards are both property rights approaches to externalities; the choice between any two property right assignment schemes involves weighing the relative cost of assignment and enforcement.

CONCLUSION

Externalities exist because "full" property rights are scarce resources which must be allocated among competing interests. Property rights are scarce because the legal and institutional arrangements necessary for their delineation are costly.

This paper demonstrates that the Pigovian approach is consistent with Coase's Theorem in that it implies no liabilities *a priori*. Furthermore, Dahlman has shown that if the market is the only allocation mechanism considered, no Pareto-relevant externalities exist. However, the market exists within a legal and institutional framework and these exchange relationships must also be considered. A potential solution to market failure is the constitutional transference in full or in part, of property rights to government of resources which give rise to conflicts between individual actions and desired collective outcomes.

When the concept of property rights is extended to include mutually advantageous transfer to government, it becomes apparent that the Pigovian approach is a special case of the more general property-rights approach. That is, Pigovian taxes are but one of many potential property rights solutions to externalities. The efficiency criterion tells us that choice between alternative property rights schemes depends on relative costs, including both market and institutional costs, but provides us with no other general prescription to handle all external effects.⁹

FOOTNOTE

1. See Knight (1952) for an early criticism of Pigou's work.
2. Goldberg (1985) states that Dahlman considers only one type of transaction cost, trading costs, while another formulation, institutional transactions costs, is closer to Coase's intent. These institutional transactions costs would involve "the shortfall from what could have been achieved if institutions worked perfectly" (1985, p. 400).
3. Note that Goldberg's criticism of Dahlman does not change the conclusion that the existence of transaction costs, in whatever form, affects the costs of assigning property rights.
4. See Varian (1984, p. 254) for the derivation of the Samuelson conditions for a public good.
5. An interesting example of this approach is Dragun (1985). Dragun argues that institutional obstacles exist within Pigovian taxes that prevent their widespread use.
6. For a similar definition of property rights, see Cheung (1979, p. 52).
7. Note that these characteristics of a property right are not independent—the restriction of the use right affects the flow of income and the stock value in transfer.
8. This analysis has an analog in corporate finance: the effect of the corporate income tax on a firm's risk. That is, the income tax makes the government a partner in the firm, sharing the risk and return from any given project.
9. This argument is a generalization of Turvey who suggests that due to information costs "any general prescription of a tax to deal with external diseconomies is useless" (1972, p. 134).

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