Toward a Theory of Public Enterprise

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> "According to the system of natural liberty, the sovereign has only three duties to attend to; . . . first, the duty of protecting the society from the violence and invasion of other independent societies; secondly, . . . the duty of establishing an exact administration of justice; and, thirdly, the duty of erecting and maintaining certain public works, . . . which it can never be for the interest of any individual, or small number of individuals, to erect and maintain . . . , though it may frequently do much more than repay [its cost] to a great society."
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> Adam Smith, [1776, p. 651]

Few writers who have touched on the subject have asserted that there exists absolutely no economic activity that ought to be provided by government. At the very least, defense and certain types of infrastructure are usually taken, at least tacitly, to be run by public enterprises. Throughout the world, even in the least centrally directed economies, we find railroads, suppliers of electricity and other enterprises run as nationalized firms. The issue I will explore is the circumstances, if any, in which dispassionate analysis should lead society to prefer particular goods or services to be supplied by firms owned and operated by government rather than by private industry.

The economic literature seems to have provided no model indicating the circumstances, if any, in which government enterprise is more advantageous socially than private. The analysis of public goods and of market failure more generally may appear to constitute such a theory, but that is a misunderstanding. These analyses indicate where public provision of funding may be justified. However, they provide no grounds for substitution of governmentally *operated* enterprises for private firms.

For example, if a lighthouse is taken as a pure public good which can serve additional ships without any increase in cost, and from which exclusion is not possible, it is true that optimal quantities of lighthouse services may not be provided without government intervention. But this intervention can simply take the form of government financing of those services, with private firms invited to do the actual work. Similarly, military equipment is traditionally supplied by private firms, notwithstanding the consensus that national defense is a public good. In short, the public goods argument merely indicates that it may be appropriate for government to supply the funds necessary to cover the cost of producing the public good. It does not by any means imply that government should either own or operate the firm that provides it.

Yet nationalized enterprises do exist and have many defenders. Moreover, all but the most extreme partisans of private enterprise seem to accept at least activities such as operation of the armed forces, the courts and tax collection as legitimate government enterprises. If this judgement is not to be interpreted as mere caprice, there must be some criteria which determine whether these are, indeed, more appropriately run by the state or by the market, and that indicate which sector is the more desirable supplier in what are, apparently, more borderline cases, such as electricity generation, postal services or telecommunications.

Here I will offer a few observations on this critical issue, and outline an approach to the subject which will, I hope, prove to be a useful direction for such an analysis.

The Allegation of Governmental Inefficiency and the Purpose of Public Enterprise

It is widely alleged that inefficiency is a general characteristic of public enterprise. The absence of a profit motive, or any other direct financial incentives, the lack of stockholders

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who can press management to maximize returns, and the immunity from competition and from takeovers which can displace an incompetent management, are all taken to stimulate inefficiency and indolence in governmentally operated firms.

The empirical evidence on the subject is actually rather more mixed. Because of influences such as separation of ownership from management and bureaucratization of larger enterprises, it is not quite so clear that all giant private firms are necessarily models of efficiency. Moreover, when the regulatory processes interfere with the firms' decisions, sometimes in curious ways, and place a premium on the replacement of engineers by lawyers in the ranks of management, the comparative performance of public and private enterprise becomes less obvious *a priori.* Though efficiency is difficult to define and still harder to measure, particularly where products are heterogenous and the available sample of comparable firms is small, such data as do exist do not uniformly indicate that private firms perform better than public. Electricity generation and transmission, for example, apparently provide some evidence suggesting the contrary [see, e.g., Pescatrice and Trapani, 1980].

But that is a side issue for our purposes. For at least part of the analysis of the role of public enterprise may well proceed on the assumption that the distinguishing characteristics of a firm owned and operated by government is the absence of incentives for efficiency. Its employees need not be paid by results, its management's performance is not judged by profit, and subsidies may make it unnecessary for its total costs to be covered. This premise—that public enterprise is inherently less efficient—is at least a useful starting point for the analysis because it puts the issue in its starkest form. If government enterprises do always suffer from an efficiency handicap, why should not *all* economic activities be left to the private sector?

One preliminary answer can be expressed as a type of moral hazard or, alternatively, as an issue involving the related field of principal-agent analysis.[1] The point is that where circumstances are such that the profit motive drives firms to behave in a manner that conflicts with the social interest, inefficiency and indolence may become a virtue--a sort of second-best solution.

The standard example of moral hazard in insurance will bring out the relevance of the point. Burglary insurance makes it economical for the policyholder to reduce his outlays on the prevention of robbery. In terms of self-interest it pays him to spend less on locks, safes and burglar alarms. Indeed, if the property in question is covered fully it is irrational, in this sense, for the policyholder to do *anything* to impede the burglar. Yet such "rational" responses drive up the cost of insurance and may even make it financially impossible for the market to offer insurance policies, despite the social value of their availability. In such circumstances it is clear that welfare may be increased if policyholders can be induced to act "irrationally" by continuing to take appropriate precautions against robbery despite their insurance coverage.

The term "moral hazard" which may be defined as a case in which measures to protect individuals or society from some unfortunate event (being robbed or being attacked by an aggressive enemy nation) elicit responses which change the character or probability of that undesired event in a way that is detrimental to the general welfare. In the usual model, it is the consumer (e.g., the buyer of burglary insurance) who reacts in such an undesirable manner. However, as we will see, similar behavioral problems can arise from the activities of producers, and it is because of this that public enterprise may sometimes prove superior to private.

In the discussion which follows it will be shown how this phenomenon can arise; it will be suggested that most if not all of the generally accepted economic tasks of the public sector share this attribute, at least to some degree.

It should be emphasized that a proposal to study the proper role of public enterprise (if

[1] For some of the literature on these subjects see references. I am indebted to Michael Porter of the Centre for Policy Studies of Monash University for the suggestion that led me to this approach.

any) is not to be construed either as an attack on the market mechanism or, at the other extreme, as an attempt to prove the undesirability of any form of economic activity by the public sector. Here I am concerned with analysis and general principles rather than any form of political advocacy.

Adam Smith and Producers' Moral Hazard

A brief digression on the *Wealth of Nations* will help to indicate that our analysis of the role of moral hazard in production is compatible with the most classic of expressions of the *laissez-faire* position.

First, it should be emphasized that Smith was no advocate of complete emasculation of government. His ideal society surely was not a state of "anarchy plus the policeman." Thus, he assigns the three major tasks to government that are listed in the quotation at the beginning of this paper. There, it will be noted that Smith implicitly recognizes the role of public goods, and the possibility that it may be appropriate for the state to intervene to assume their provision.[2]

Smith goes even further than this, explicitly taking account of the externalities argument for interference with the free market (with "natural liberty"). Thus, he admits that it is an interference with natural liberty to restrict certain activities of banks which he believes to have detrimental social consequences. But he tells us that such interferences should be and always have been considered legitimate tasks of government, and that they are in this respect no less legitimate than the restriction of natural liberty involved in a law requiring the construction of (fire resistant) walls to prevent the communication of fire. "Such regulations may, no doubt, be considered as in some respect a violation of natural liberty. But those exertions of the natural liberty of a few individuals, which might endanger the security of the whole society, are, and ought to be, restrained by the laws of all governments;" [*Wealth of Nations*, p. 308].

This, however, is not the critical issue here—the possibility that in certain circumstances it may be desirable to eliminate the incentives which are offered by the market mechanism, and to substitute the provision of the services in question by public sector employees. Indeed, Smith goes rather far in the other direction arguing that even (!) university professors should be paid on the basis of the number of students they are able to attract, rather than being given a fixed stipend. Otherwise, Smith tells us, the faculty member's ". . . interest is . . . set as directly in opposition to his duty as it is possible to set it. It is the interest of every man to live as much at his ease as he can; and if his emoluments are to be precisely the same, whether he does, or does not perform some very laborious duty, it is certainly his interest, . . . either to neglect it altogether, or . . . to perform it in as careless and slovenly a manner as [the authorities] will permit. . . In the University of Oxford, the greater part of the public professors have, for these many years, given up altogether even the pretence of teaching." [*Wealth of Nations*, p. 718]. Other occupations, too, are performed best under a system of payment by results, according to Smith. But he notes a possible and significant exception—the clergy. Here, rather than speaking for himself he quotes his friend, David Hume (who, understandably, was not much admired by the contemporary religious establishment), "It may naturally be thought, at first sight, that [the encouragement of ecclesiastics] may safely be entrusted to [the demand of consumers of their services. The ecclesiastics'] industry and vigilance will no doubt be whetted by such an additional motive . . ."

"But if we consider the matter more closely, we shall find that this [self] interested diligence of the clergy is what every wise legislator will

[2] Elsewhere, in his earlier *Lectures* Smith dealt even more explicitly with the public goods issue. Thus, see *Lectures on Jurisprudence,* Report of 1862-63, Meek, Raphael and Stein (eds.), pp. 25-6. ". . . there are many [things] that are to be considered as common to all, as they cannot be lessened or impaired by use, nor can anyone be injured by use of them. Thus the air is necessary to be breathed by all, and it not rendered less fit or less in quality for the use of others . . ." Since these lectures were recorded by (unknown) students rather than Smith himself, sueh passages must, of course, be approached with some caution.

study to prevent; because . . . it has . . . a natural tendency to pervert [even] the true [religion] by infusing into it a strong mixture of superstition, folly, and delusion. Each ghostly practitioner, in order to render himself more precious and sacred in the eyes of his retainers, will inspire them with the most violent abhorrence of all other sects . . . . No regard will be paid to truth, morals, or decency in the doctrines inculcated . . . . And in the end, the civil magistrate [ruler] will find, that he has dearly paid for his pretended frugality, in saving a fixed [emolument] for the priests; and that in reality the most decent and advantageous [arrangement] which he can make with the spiritual guides, is to bribe their indolence by assigning stated salaries to their profession, and rendering it superfluous for them to be further active . . ." [*Wealth of Nations*, pp. 742-43].

It may be useful to restate Hume's argument in terms of our discussion. The clergyman's task is to minister to the spiritual desires (needs) of those who come to him voluntarily. The number of these self-selected adherents corresponds to what the moral hazard literature refers to as the "state of nature." But once the clergyman is paid by results he will not resist the inducement to alter the state of nature—to drum up business perhaps by seeking to terrify potential parishioners whose state of equanimity might otherwise have undermined their demand for his ministrations. Here we have a clear case of moral hazard in the supply of a service under a market-like mechanism. Payment by results, which may be helpful in inducing diligence in serving those churchgoers who choose by themselves to seek spiritual comfort, elicits an attempt to change the state of nature. The potential consequences are, according to Hume, so undesirable that society may at least in this case turn out to regret its reliance on the profit mechanism. It is therefore better, in Hume's view, to have clergymen paid by "the magistrate" (the state) precisely because it removes the unfortunate incentive to efficiency in pursuit of customers for spiritual guidance.

Thus, the virtue of state-run enterprise in such circumstances is its propensity to "bribe indolence" on the part of its employees. The first step in our analysis, then, is to determine the circumstances in which such moral hazard arises, and in which it may be dealt with most effectively by the removal of financial incentives, which public enterprise is ostensibly best equipped to do. I will start by discussing some more pertinent examples.

Some "Natural" Public Activities

As a further clue to the analysis of our basic issue it may be helpful to examine a few examples. National defense is perhaps the most obvious candidate of the economic activities appropriate for the public domain. Even Adam Smith, as we have seen, expresses no reservations about this. Yet, clearly, private operation of armies is neither infeasible nor unknown in the past. Why does it not make sense for a nation to turn to the free market for military protection? The answer appears to be a clear case of moral hazard. A government presumably intends to use its armed forces only when it is threatened by foreign attack or when it itself decides to pursue a policy of aggression. In either case, so far as the armed forces are concerned, that is the "state of nature"— the exogenously determined state of affairs. And in either case, the civilian government hopes that the army will exercise its force only when it is called for by the given state of nature.

However, an army which is operated on market principles is unlikely to be paid for inactivity. An unemployed private army seems all too likely to make work for itself. The turbulent medieval barons, the marauding companies that scourged the French countryside during the Hundred Years' War, and the Chinese warlords of the 3rd and 4th decades of the twentieth century are interpretable as examples of the search for employment by private military groups. The unfortunate consequences for the civilian population are common knowledge. Here supply-side moral hazard takes its most dramatic form and this is the source of the benefits of the weakening of incentives that only the public sector can offer.

A second illustration of an activity that seems "naturally governmental" is tax collection. This, too, has in the past been provided by private firms and, at least by repute, the results were quite catastrophic. The tax actions of the so called "tax farmers" of the *ancien régime* are often cited as a prime source of the unrest that culminated in the French Revolution. This is another example in which incentives for achievement can produce results which the public is unlikely to welcome.

Another prime example of an activity usually assigned to government is the working of the legal system, including the police and the courts. Private arbitrators and private police forces show that these activities, too, need not be carried out by the public sector [see, e.g. Landes and Posner, 1975, for a discussion of this subject]. I will return later to the organization of police activity, a subject to which it may prove useful to apply the mathematical approaches of the literature of moral hazard.

The operation of the judiciary, on the other hand, indicates that sometimes a compromise which, at least to some degree, avoids both moral hazard and inefficiency can be achieved with the help of nonpecuniary rewards such as honorific status and institutionalized integrity. A judicial system appears to rely heavily on this for its effectiveness and the degree of trust it can command.[3]

The Borderline Cases

The theory of public enterprise will, of course, not be very useful if it merely confirms the appropriateness of governmental provisions of defense, judicial activity and other obvious candidates for inclusion in the public sector. It is much more critical to shed some light on the advisability or inadvisability of measures such as nationalization of public utilities and other enterprises likely to acquire monopoly power and, more generally, the use of public sector supply as a means to reduce the severity of market failure. This is the arena in which a good deal of debate over policy is centered. The set of options that are usually considered is fairly narrow, including, for example, the need to choose among unrestrained monopoly, direct regulation and public ownership, each of which is likely to affect economic efficiency adversely.

It is here that the principal-agent analysis can be helpful. This approach offers us an additional set of options for the amelioration of market failure. The literature stresses the importance of the terms of the contract (explicit or implicit) between the principal and the agent, the reward arrangement it institutes to induce the agento to promote the principal's interests most effectively, and the amount of information available about the agent's actions, i.e., the ease with which these activities can be monitored.

The case of pollution emissions as an example of market failure, though not in itself particularly germane to the discussion of public enterprise, does help to bring out some of the pertinent relationships. Here is a case in which the private firm, acting as the output producing agent on behalf of the general public (the principal) is induced to emit undesirable amounts of pollutants by the market's reward arrangement.

Certainly nationalization is not an automatic solution to the problem. It is näive to assume that civil servants in control of a public enterprise will, out of dedication to the general welfare, give due weight to the public's interest in clean air and water. Pollution problems abound in the Soviet Union and Soviet managers are notorious for their propensity to ignore environmental goals in their anxiety to fulfill production plans [see, e.g., Goldman, 1972]. In the United States, the Tennessee Valley Authority, the country's only federal supplier of electricity, was for a long time considered the industry's worst polluter. Clearly, neither the weakness of profit incentives nor the dedication of public employees is always enough to eliminate problems of market failure or reduce them to negligible proportions.

The effluent charges or other financial incentives that economists have proposed for the purpose instead of nationalization, can be interpreted in terms of principal-agent analysis as a change in the rules of compensation of the agent that is designed to elicit performance better attuned to the principal's goals. And here, as in other principal-agent problems, the

[3] For a systematic discussion of such mechanisms with particular attention to voluntary blood donation, see Titmuss [1971].

amount of information available to the principal also plays a key role. Thus, as has been recognized in the environmental literature, difficulty in monitoring is, in a number of cases, a prime impediment to the use of effluent charges to control pollution.

Of course, environmental issues as such play no significant role in the debate over public and private enterprise. Pollution was mentioned here only because it helps to illustrate the connection between our subject and principal-agent theory.

The discussion also indicates that in the analysis of policy toward natural monopolies it may be misleading to pose the issue as a choice simply between public and private ownership. Whatever choice is made between these, it may be necessary to see whether the terms of the agent's contract can be modified in a way that elicits optimal performance.

An example which seems suggestive if, perhaps, impractical politically will be described briefly in the next section.

Coinsurance and Incentives for Police Activity

The moral hazard literature suggests at least one other sort of application of its type of analysis to the activities of the public sector. There is an analogy between the issues involved in compensation of the police force and the dilemma that arises in the design of insurance policies. The theoretical writings on the subject come to the very reasonable conclusion that optimality calls for the provision of insurance with coverage limited to only part of the potential losses (coinsurance).[4] In that way some protection against the risk of loss from theft is provided, but some incentive for measures to impede burglary also remains.

The mathematical approach which yields this result may also offer some guidance for public enterprise. There is a direct analogy between the dilemma of insurance design and that facing the design of incentive structures for public enterprises. In economic activities involving significant problems of moral hazard in production,as we have seen, the absence of strong incentives becomes a prime justification for government ownership. On the other hand, though the absence of incentives reduce moral hazard, it also impedes efficiency and effectiveness in carrying out the obligations of the pub-agency. Thus, here again, there is a trade off between conflicting objectives, and one may expect that, as in insurance, the optimal solution will, at least in some cases, involve a compromise between moral hazard and efficiency.

A specific example will indicate the form the issue can take and will illustrate the sort of compromise it may be appropriate to consider. Consider the role of the police in preventing hazardous driving practices. The danger to civil liberties of having the police levy and collect fines as private profit maximizing agencies is clear enough. But the inducement to lack of effort which is constituted by the fixed wages of policemen can also easily be excessive. The relative impunity with which unscrupulous drivers ignore traffic lights in a number of U.S. cities may in part reflect the absence of financial incentives for the police to pursue the perpetrators of such dangerous misdemeanors energetically. Though the notion may, on first consideration, be rather shocking, the insurance solution suggests by analogy that an optimal arrangement may provide some financial stake to the police in the effective pursuit of dangerous violations of traffic rules. For example, the sharing of traffic fines by the police and the municipality in some suitable proportion may perhaps elicit the desired degree of enforcement activity.

The coinsurance type of solution may, thus, apply to a variety of moral hazard problems, including production in areas where public enterprise is appropriate.

Concluding Comment

It has been suggested that moral hazard in production may be the key element in the justification for public enterprise. Perhaps there exist other defensible grounds for government ownership and operation of firms. For example, it may be argued that society can ill-afford the efficiency costs imposed by

[4] See, e.g., Pauley [1968] [1974], Spence and Zeckhauser [1971], and Shavell [1979].

monopolies unconstrained either by government intervention or by the contestability of the market. In that case one may be forced to choose between strict regulation or public ownership. But where regulation can be shown to lead to enormous inefficiency nationalization may indeed contribute to economic welfare.

The point here is not to argue for any hard and fast conclusions, but merely to suggest that the issue with which I have been dealing is important and has hardly received the attention it deserves. Indeed, one is driven to the surprising conjecture that the literature literally contains no theoretical treatment of this vital subject. I have sought to suggest some approaches which can serve as a beginning for the requisite analysis and end, therefore, with a plea for others to join me in considering the subject further.

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