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Incentives for Solving Social Problems

Financial incentives to control behavior may be the only practical approach to problems as diverse as slum abandonment and toxic-waste dumping.

For at least half a century, economists have believed that governments should use financial incentives to correct many social problems: forcing polluters to pay for the damage they cause, for example. While most economists recognize that such incentives cannot work with textbook perfection, they see advantages over typical clumsy regulatory programs. Financial incentives require much less information in the hands of government; they provide more effective spurs for private decision-makers to act in ways that allocate resources in the public interest; they place the financial burden on the producers and consumers who carry out the undesirable behavior and benefit from it, and they typically entail much less government intrusion into private affairs.

But can financial incentive programs solve all social problems? If not, how can one characterize the set of problems for which they are the most practical solution? We believe financial incentives can be used to

alleviate a set of problems, such as abandonment of slum buildings and the breakdown of law and order, for which they are not often thought to be of much help. Most of the suggestions that follow are just that: their details must be worked out, and they undoubtedly require modifications to make them practical. Some might not work at all. Our purpose, however, is to propose new ways to think about old, seemingly intractable, problems. In some cases, there simply seems to be no effective way other than financial incentives to deal with the issues.

Conventional pollution problems

Undoubtedly the best analyzed and most discussed financial incentive program for any social problem is effluent fees for conventional pollutants. Private negotiations and agreements usually cannot attain the opti-

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mal reductions of such discharges, both because of the large numbers of polluters and people affected and the difficulty of ascertaining which discharges have what effects on particular people. In such situations, governments can levy effluent fees on dischargers; set at appropriate levels, the fees induce polluters to reduce discharges by optimal amounts, taking account of both the damages to people from the remaining discharges and the costs of additional abatement.

Conventional polluting discharges often make ideal subjects for effluent fees because the actual and potential sources are reasonably easy to identify and the discharges are easy and inexpensive to meter. The sulfur content of fuel, for example, is easy to meter. The sulfur content of smokestack gases is harder to meter, but an effluent fee program can work on the assumption that all the sulfur in the fuel burned goes up the stack unless the company can show how much has been removed by one device or another.

But for many social problems which private agreements cannot control optimally, the actual and potential offenders are not identifiable or the problems are not meterable at reasonable cost, or both. Financial incentives may nevertheless be valuable in dealing with such problems, and may produce more desirable solutions than the alternative of government regulation, though they can hardly satisfy textbook optimality conditions.

Where metering won't work: littering, oil dumping, slum abandonment

Even if a particular type of harmful behavior cannot be metered at tolerable cost, identifying the set of potential sources of the behavior can make a powerful and socially efficient financial incentive possible.

The paradigm for the class of problems we have in mind is the requirement of deposits on reusable containers for soft drinks and other beverages. In this case, the set of potential dischargers can be identified as those who buy beverages in the containers whose improper disposal mars the landscape. But the harmful behavior—disposal of empty containers on roads and playgrounds—cannot be metered at tolerable cost. The solution adopted in many states is a deposit large enough to motivate the buyer to return the container or to motivate children to collect containers for profit. Upon return, the containers are either reused or dis-

posed of properly.

Deposits have been discussed to prevent abandonment of automobiles, but no careful scheme seems to have been tried. The undesirable behavior is the abandonment of junked cars on roads and in fields and streams. Again, the potential sources of undesirable behavior are easily identified: those who own cars. But it is hard to meter the behavior for much the same obvious reason that it is hard to meter littering with soft-drink containers. In the case of autos, the deposit can be paid to the state when the car is registered. Deposits should be sufficient to pay the cost of disposal of the car if it is abandoned. They should earn interest, which would presumably be more than adequate to pay annual registration fees. The deposits would be refunded when the car was presented either for reuse or proper disposal, say to a junk dealer.

Two other natural applications of required deposits appear to have been ignored in the literature. The first is ocean or harbor dumping of oil. Empty oil tankers wash out and drain their tanks before taking on another load. If this is done on the ocean or into an estuary, waste petroleum may harm sea life, eventually float to land and spoil beaches, and cause a variety of other forms of damage. Proper disposal is costly—it is far less expensive to discharge the wastes at sea or in an estuary where no one is likely to observe the dumping; as a result, the international antidumping agreements are all but unenforceable.

The world's tankers, however—the potential sources of the harmful behavior—are all known. It is by no means impractical to require each tanker to leave with a national (or, preferably, international) agency a cash deposit of suitable magnitude before it is permitted to pick up or deliver oil. Interest payments on the deposit can be provided to keep it from constituting a financial loss to the shipowner. It would then be up to the ship's captain to provide evidence that his tanks had been cleaned at a proper facility each time an oil delivery was made. Failure to supply the required evidence would mean confiscation of the deposit.

A third example is the use of deposits to prevent abandonment of slum buildings. Slum ownership is frequently disguised by dummy firms and a variety of other devices which make it all but impossible to identify the true owner. The latter may find it profitable to extract rents for some years while investing little or nothing in maintenance and repairs. At some point it becomes cheaper to abandon the building altogether,

leaving it as a shelter for crime, a fire hazard to neighboring buildings, a repository for garbage, a breeding ground for vermin, and a peril to the community. A deposit could be extracted from the owner of a building when title to a building is first transferred—and, for this purpose, there is no need to know precisely who the owners are. A faceless landlord who has paid a deposit has as much to lose by forfeiting his deposit as one whose identity is known. The deposit would be refunded only when the building was sold (and the deposit replaced by another) or when it was demolished and the rubble removed in an acceptable manner.

Such deposits would need to be substantial—enough to cover the cost of demolishing or rehabilitating the structure if it is abandoned. Demolition and clearing costs are probably a minimum of \$100,000 per acre, assuming a solid block of two-story buildings. That is likely to come to \$10,000 per dwelling. That sum is not small relative to the value of many slum dwellings; if it were, they would not be abandoned. Of course, interest should be paid on deposits. Such interest would pay a substantial fraction of the real estate taxes on many slums.

The deposit approach would be self-enforcing and would require little monitoring or collection of data by authorities. The deposit approach may also be taken to be superior in terms of equity or fairness: it does not reward the potential polluter for abstaining from anti-social behavior, which is a bit like paying potential criminals for refraining from crimes.

Unidentifiable sources: toxic wastes and drug abuse

If it is practical neither to identify potential sources of harmful behavior nor to meter their behavior, then economic analysis offers little guide to optimal financial incentives or to any other means of control. The best paradigm for this case is toxic wastes.

Toxic wastes may be among the most serious of the emissions problems besetting society and, at the same time, among the most difficult to bring under control. Thousands of firms, many of them very small, produce toxic substances. Some of them generate tiny amounts of waste which are, however, so lethal that small quantities can cause very great damage. Furthermore, many toxic products are used in further production by a wide variety of firms other than their producers. Together, these characteristics make evasion all too

easy. Many producers and users of toxic substances are not even known to relevant government agencies, since the population of small firms in question changes constantly. The small quantities of the wastes makes it difficult for outsiders to know when they are being gotten rid of. Moreover, this is an arena in which crime does pay, for reasons we will note, so enforcement activities must contend with professional criminals and not just amateurs.

In passing, we should point out that the best procedure for dealing with toxic waste varies. In some cases the social interest is best served by halting production of the waste-generating outputs. In other cases the product is best modified to reduce the magnitude or toxicity of the wastes. Recycling, treatment to reduce toxicity, incineration, burial in conventional landfills or disposal in “hardened” facilities designed to resist escape of the dangerous materials—each may be appropriate for different materials and in different circumstances. This is in marked contrast with conventional approaches, which frequently proceed as though one procedure were best in all cases: for example, the water pollution control programs which have generally called for the use of conventional water treatment plants, even though in many cases other approaches are superior. It is important that government programs to control toxic wastes not impose a narrow range of solutions for all situations.

The enforcement approach which has been widely adopted in the case of toxic substances involves two elements: collection of extensive data on generation and disposal (“cradle-to-grave” monitoring); and stiff penalties for violations. Such an approach creates several problems. First, the required data are extremely difficult to obtain; after all, monitoring difficulties lie at the heart of the toxic-substances problem. Second, and more important, heavy penalties are a stimulus to crime. They are an inducement to adopt disposal practices which are especially difficult to detect, and which may be particularly harmful. A notorious example is the apparently widespread practice of filling a tank truck with a toxic liquid and then driving with an “accidentally” open spigot along an isolated road on a dark, rainy night. The toxic liquid can contaminate crops or seep into water supplies, where it constitutes a direct threat to human life and health. Such situations can be counted upon to elicit demands for tougher enforcement measures and the use of more policemen for the purpose, but the history of prohibition shows

how hopeless this approach is apt to be.

There is an alternative which may well prove cheaper and far more effective: incentive payments to those who bring their toxic wastes in for disposal. While a payment to the (potential) polluter is not inherently attractive on grounds of fairness, subsidies to reduce emissions of ordinary pollutants are by no means rare. More to the point, there may be no effective alternative in the case of toxic substances.

The arrangement has several desirable features. It would take the profit out of criminal activity in this arena, since the subsidies would make it more rewarding financially for the producer or user of toxic materials to dispose of them legally than outside the law. Second, the approach would dispense with the need for collecting elaborate and extensive data. The waste producers would be induced to identify themselves, since the subsidies could be earned only in this way. The program would thus be easy to administer and become virtually self-enforcing.

It is important to choose the subsidy levels carefully. If the subsidies are sufficiently great, they can make it profitable for unscrupulous entrepreneurs to manufacture inexpensive toxic substances which will make them eligible for payments. Even if the subsidy is not so large as to elicit such deliberate production of toxic materials, it can be expected to induce *some* increase in the flow of toxic substances. Consider a borderline case in which two processes yield the same final product, one of them generating two grams and the other three grams of toxic waste per kilo of final product. If without the subsidy the two-gram process were marginally more profitable, the subsidy might tip the balance the other way. The subsidy is also likely to increase the number of firms engaged in processes that generate toxic wastes. Thus, while a subsidy for disposal of such wastes may be the only effective and practical way to deal with them, it can be expected to cause a partially offsetting increase in the amounts of such wastes society is forced to deal with. If it is impossible to identify potential sources of undesirable behavior and to meter such undesirable behavior, there is no way to design government programs that can meet economists' full requirements for social efficiency of resource allocation.

A second serious social problem falls in the same category. It appears nearly impossible either to identify the set of people who are potential drug abusers or to meter their behavior. As we have noted, criminal activ-

ity in some economic markets may be ascribed to the attempt to deal with the problem through punitive measures. Prohibition of alcohol production and sale in the United States in the 1920s attracted bootleggers and protected their financial interests. Penalties on improper disposal of toxic wastes has given rise to "midnight dumpers." Some also argue that penalties for sale or use of habit-forming drugs such as heroin and cocaine bring profit to the drug trafficker and make it lucrative for pushers to provide free samples in schools. More than that—according to this view, the resulting high cost of drugs forces addicts to turn to crime and thereby creates an army of petty criminals.

The entire topic has been a matter of intemperate controversy, in which preconceptions may have taken priority over evidence. It is not our objective to leap into the discussion with another ill-informed opinion. Rather, we want only to show how financial inducements can conceivably be used to alleviate the problem.

Those who advocate decriminalization of drug consumption claim that the English system, under which doctors are permitted to supply drugs at low prices to certified addicts, constitutes a model for other countries. Others note that the repeal of Prohibition did not end drinking or alcoholism. But what it surely did was reduce the profitability of bootlegging and, hence, substantially decrease the role of crime in alcohol manufacturing and distribution. It also reduced the associated violence, the incidence of poisoning by impure ingredients, and the outlay of resources by law-enforcement officials.

Legalizing the consumption of narcotics as well as other allegedly victimless crimes, then, is hardly an open and shut matter. But it clearly merits serious consideration. It is certainly useful to analyze it as an incentive mechanism in the pursuit of significant social goals.

Product liability

Liability for the damage resulting from the sale of dangerous products falls logically in the area we defined in the previous section. It is neither easy to identify the set of potential sources of socially undesirable behavior nor to meter the relevant behavior. But it is even more complex than the problems discussed in the previous section, so we have reserved it for separate discussion.

Normal market incentives are the traditional and most important form of product liability. Firms that make poor, dangerous, or overpriced commodities suffer financial losses in a competitive economy. Thus, competition is the most important guarantor of product liability.

It is certainly justifiable, however, for laws to impose liability beyond that exacted by competitive forces. To take an extreme example, suppose that a producer can discover by inexpensive laboratory research, or may even already know, that a diet pill it manufactures is extremely carcinogenic. It is likely that people will *eventually* cease to buy the pill because of its severe health effects. But desirable market forces may work only after users have suffered damage quite out of proportion to the costs that the producer would have needed to bear to achieve the same result. Of course, independent firms can test the product in the same way the producer can, but they may lack the financial incentive to do so, and testing may be more expensive and time-consuming for them than for the producer, who knows the product's contents in advance of its sale.

The basic issues which product liability raises are how broad it should be and what mechanism should be used to impose it. The basic guideline for socially efficient resource allocation should be imposition of the costs where they are smallest; if the cost to the producer of ascertaining side effects and dangers or of designing a safe product are smaller than the costs consumers incur in making judgments about such matters, then the cost should be imposed on producers.

The subject is complicated dramatically by its close linkage with research and development and the introduction of new products. Economists have long worried that market forces provide too little incentive for profit-seeking firms to undertake research and development, largely because it is not practical to define full property rights in the resulting knowledge. Unable to capture more than a small fraction of the social benefits derived from their research and development outlays, firms may devote fewer resources to such activities than would be in society's interest. New products also incur the greatest risk of causing harm to consumers, since less experience and study have been accumulated for them than for older products. A balance must be struck between loose liability standards to encourage product innovation and severe standards to protect consumers from excessive risks. The point widely

overlooked here is that excessively tight standards can actually *endanger* consumers, by delaying or preventing the appearance of items that might protect their health or welfare.

Simple criteria can be used to place bounds on the desirable liability provisions. First, producers ought to be liable for product characteristics which they know or might cheaply know, and which might harm people. An easy corollary is that manufacturers should be liable if they do not disclose dangers they know of or if they knowingly make false claims about product safety. To take another extreme case, suppose an electric hair dryer ignites the hair of a significant percentage of users. Clearly, the manufacturer ought to be liable for damages. It is not difficult to manufacture a safe hair dryer, and many manufacturers have done so. The manufacturer in this example either knew or could have known at modest cost that the product was dangerous. Ignorance should not be blissful; liability rules should encourage manufacturers to know what it is not unduly expensive to find out.

Second, consumers should have the responsibility of using products with care and discovering product characteristics themselves. Manufacturers should not be liable if consumers are injured because they use the hair dryer while in a bathtub full of water or if they use the dryer to defrost the refrigerator. Consumers can cheaply avoid much injury with common sense. It would be expensive or impossible for a manufacturer to state all the ways in which a product can be misused dangerously.

These principles are important and can narrow the scope of desirable liability, but they leave a wide range of uncertainty between them over the proper magnitude of liability. It may not be possible to formulate precise principles that will apply in all or most cases.

As with the social problems discussed earlier, society must choose between direct regulation and financial incentives. Direct regulation in this area requires government agencies to have control over product characteristics and, especially, over the introduction of new products. The Food and Drug Administration is the key U.S. paradigm, but many regulatory agencies have some such powers. Financial incentives—financial penalties for harm done by products to consumers—are predominantly levied by courts within the framework of broad legislation and common law. Thus, both approaches are used in the United States and, in recent history, both apparently have tended to

be excessively stringent. To some extent, stringency results from a pervasive anti-business attitude. But both the regulatory institutions and the courts face inappropriate incentives. Politically speaking, the FDA “catches it” if it approves a drug that turns out to be carcinogenic. It is much less liable to complaints if people die of cancer because its requirements indefensibly discouraged research and development and delayed product introduction. Similarly, courts are charged with the responsibility of ascertaining liability and of levying damages. They receive no pertinent evidence, and cannot rule, that excessive liability may discourage product innovation. In practice, judges and juries are frequently overwhelmed by compassion for people thought to have been injured by the products of large, rich, indifferent corporations. A large damage award, while it may be a large multiple of the victim’s assets, may still be a small proportion of a corporation’s assets or profits—but a pattern of such awards can indefensibly impair incentives for product innovation.

In principle, appropriate product liability rules provide correct incentives to producers. They induce producers to take account of the full social costs of production and use of their products, including the social cost of possible injury to consumers. They are precisely similar to the incentive effects that effluent fees provide producers to discharge no more than socially efficient amounts of pollutants. And they avoid bureaucratic intrusion into the details of business decision-making.

In principle, a platonic government agency could set liability rules for each particular type of damage: so much for lung cancer; so much for a headache; and so forth. This is similar to the procedure used in workers’ compensation for industrial accidents. The same agency could also set guidelines for courts to use as to evidence of liability, in class action suits, etc. In practice, however, there are several problems. First, platonic government agencies are scarce. As has been indicated, those now in existence tend to err on the side of excessive caution and conservatism. Second, it may not always be possible to collect the optimal amount of payment damages. Corporate owners’ liability, quite properly, extends only to the value of their corporate shares, and a product’s damages may well exceed the value of the producer’s assets or shares. This is a clear issue in the case of nuclear power plants, and possibly in other industries. Requirements that producers post

bonds or insure themselves for product liability are at least partial solutions. Current U.S. laws that make bankruptcy excessively easy, however, exacerbate the problem.

Third, at present some U.S. producers are required to jump through both the regulatory and the product-liability hoops. Drug companies and commercial airlines, for example, are subject to regulatory controls on their products and to product liability for damages because of defective products. It would be difficult to imagine a system better designed to generate product stagnation.

Inadequate law enforcement

Our society is widely thought to be suffering from a general breakdown of law and order. The law is violated not only by criminals of the traditional variety but also by ordinary citizens who, for example, do not stop at red traffic lights despite the danger this imposes on others. Even the increasing litter on urban sidewalks shows willingness to flout the law. Politicians see the remedy in crackdowns by the police, but somehow these rarely materialize; when they do, they are generally (and predictably) brief.

Financial incentives in this arena will undoubtedly prove even less attractive than in any of the other areas we have discussed. Any supplementary and routine financial reward to the police simply for doing what is termed “their duty” is likely to be considered corrupting and immoral. The unpleasant fact, however, is that we may have to choose between this course and continued disintegration of the social compact under which people refrain from antisocial behavior on the implicit understanding that others will do the same. It is curious that a society so habituated to proclaiming the virtues of the profit motive is so willing to circumscribe it, on aesthetic grounds, in areas where it is perhaps needed most urgently.

There are many obvious ways to provide financial inducements for more energetic law enforcement. The following illustration is not offered as a serious proposal, merely as an example of the ease with which one can be concocted. Suppose that the fine for failure to stop at a red traffic light were set at \$100. A reduction to \$60 could then be provided for on-the-spot payment by check or credit card. In addition, the police officer catching the violator could receive, say, 25 percent of the payment as a bonus.

There is, of course, no obvious way to arrive at the optimal amounts for these figures, though a formal theoretical exercise involving the (marginal) costs and benefits can easily be conducted. It must be admitted that data limitations and political realities reduce the search for anything like optimal figures to the pursuit of a chimera. More to the point are the issues relevant to acceptable judgments on the matter. Clearly, the fines must be large enough to be deterring. The discounts for immediate payment should be great enough to discourage postponement and the possibility of evading payment (which requires still more police activity). The bonus to the police should elicit a substantial increase in vigilance, but it should not make the risks of false arrest worth undertaking. These are matters involving delicate judgment and there can be no categorical answers. Yet one judgment can be ventured with confidence. Such an arrangement would almost certainly make the petty but serious violations against which they are directed disappear overnight. Moreover, no alternative proposal has been offered which holds the slightest promise as an effective bulwark against the breakdown of public mor-

ality that threatens our society.

Are there alternatives?

There are several purposes to this article. First, we have sought to show once again why economists consider financial inducement to be so important a weapon in eliciting improved performance by the economy and in individual activities, from the viewpoint of the social welfare. Second, we have sought to show the need for flexibility in the design of these financial inducements.

Most important, however, we have argued that in at least some cases *no* effective alternatives to financial inducements are available. In such cases financial inducements recommend themselves not on grounds of optimality or efficiency, but because there simply are no other options. This is notably true for toxic waste disposal and the breakdown of law and order. In these cases the community will have to decide whether it can afford to yield to its distrust of the morality of monetary inducements—and, as a result, pay the heavy price in terms of human health, safety, and quality of life.

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