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The Journal of Legal Studies, Vol. 13, No. 2. (Jun., 1984), pp. 357-374.

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LIABILITY FOR HARM VERSUS REGULATION OF SAFETY

STEVEN SHAVELL*

I. INTRODUCTION

LIABILITY in tort and the regulation of safety represent two very different approaches for controlling activities that create risks of harm to others. Tort liability is private in nature and works not by social command but rather indirectly, through the deterrent effect of damage actions that may be brought once harm occurs. Standards, prohibitions, and other forms of safety regulation, in contrast, are public in character and modify behavior in an immediate way through requirements that are imposed before, or at least independently of, the actual occurrence of harm.

As a matter of simple description, it is apparent that liability and safety regulation are employed with an emphasis that varies considerably with the nature of the activity that is governed. Whether I run to catch a bus and thereby collide with another pedestrian will be influenced more by the possibility of my tort liability than by any prior regulation of my behavior (informal social sanctions and risk to self aside). Similarly, whether I cut down a tree that might fall on my neighbor's roof will be affected more by the prospect of a tort suit than by direct regulation. But other decisions—whether I drive my truck through a tunnel when it is loaded with explosives or mark the fire exits in my store, or whether an electric utility incorporates certain safety features in its nuclear power plant—are apt to be determined substantially, although not entirely, by safety regulation. There are also intermediate cases, of course; consider, for instance, the

* Professor of Law and Economics, Harvard Law School. I wish to thank Bruce Ackerman, Susan Rose Ackerman, Lucian Bebchuk, Paul Burrows, Louis Kaplow, Mark Kelman, and Richard Stewart for comments and the National Science Foundation (grant no. SES-8014208) for financial support. A formal version of the main argument of this article is made in my *Harm as a Prerequisite for Liability* (1979) (unpublished manuscript, Harvard Univ. Dep't of Econ.); and in *A Model of the Optimal Use of Liability and Safety Regulation* (forthcoming, Rand J. Econ.). The present article will provide the basis for a chapter in the part on torts of *A Theoretical Analysis of Law*, a book on which I am at work.

[*Journal of Legal Studies*, vol. XIII (June 1984)]

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behavior of ordinary drivers on the road and the effects of tort sanctions and regulation of automobile use.

What has led society to adopt this varying pattern of liability and safety regulation? What is the socially desirable way to employ the two means of alleviating risks? These are the questions to be addressed here, and in answering them I use an instrumentalist, economic method of analysis, whereby the effects of liability rules and direct regulation are compared and then evaluated on a utilitarian basis, given the assumption that individual actors can normally be expected to act in their own interest.¹ In making this evaluation, I have not counted compensation of injured parties as an independent factor on the grounds that first-party insurance (augmented if necessary by a public insurance program) can discharge the compensatory function no matter what the mix of liability and regulation. Likewise, for simplicity I ignore the complications that would be introduced by considering interest group theories of regulation.² Also, I do not make an explicit attempt to determine the extent to which the conclusions reached may be separately attributable to either of the two dimensions in which liability and safety regulation differ: employed only after harm is done versus beforehand; employed only at the initiative of private parties versus a public authority.³

Subject to these caveats and assumptions, this article first discusses four general determinants of the relative desirability of liability and regulation. It then argues in light of the determinants that the actual, observed use of the two methods of reducing risks may be viewed as socially desirable, or roughly so. The article concludes with several qualifying remarks and with comments on how the analysis could be extended to incorporate additional means of social control including the fine and the injunction.

II. THEORETICAL DETERMINANTS OF THE RELATIVE DESIRABILITY OF LIABILITY AND SAFETY REGULATION

To identify and assess the factors determining the social desirability of liability and regulation, it is necessary to set out a measure of social welfare; and here that measure is assumed to equal the benefits parties

¹ This is the general approach adopted by two influential legal scholars in their analyses of tort law; see Guido Calabresi, *The Costs of Accidents*, 1970; and Richard Posner, *Economic Analysis of Law* (2d ed. 1977), ch. 6.

² See, for example, George Stigler, *The Theory of Economic Regulation*, 2 *Bell J. Econ.* 3 (1971); and Sam Peltzman, *Toward a More General Theory of Regulation*, 19 *J. Law & Econ.* 211 (1976).

³ But the concluding discussion may help the reader to make a judgment about this issue.

derive from engaging in their activities, less the sum of the costs of precautions, the harms done, and the administrative expenses associated with the means of social control. The formal problem is to employ the means of control to maximize the measure of welfare.

We can now examine four determinants that influence the solution to this problem. The first determinant is the possibility of a *difference in knowledge about risky activities* as between private parties and a regulatory authority. This difference could relate to the benefits of activities, the costs of reducing risks, or the probability or severity of the risks.

Where private parties have superior knowledge of these elements, it would be better for them to decide about the control of risks, indicating an advantage of liability rules, other things being equal. Consider, for instance, the situation where private parties possess perfect information about risky activities of which a regulator has poor knowledge. Then to vest in the regulator the power of control would create a great chance of error. If the regulator overestimates the potential for harm, its standard will be too stringent, and the same will be the case if it underestimates the value of the activity or the cost of reducing risk. If the regulator makes the reverse mistakes, moreover, it will announce standards that are lax.

Under liability, however, the outcome would likely be better. This is clear enough under a system of strict liability—whereby parties have to pay damages regardless of their negligence—for then they are motivated to balance the true costs of reducing risks against the expected savings in losses caused. Now assume that the form of liability is the negligence rule—according to which parties are held responsible for harm done only if their care falls short of a prescribed level of “due” care—and suppose further that once harm occurs, the courts could acquire enough information about the underlying event to formulate the appropriate level of due care. Then parties, anticipating this, would be led in principle to exercise due care.⁴ The situation is altered for the worse if the courts are unable to acquire sufficient information to determine the best level of due care; but the outcome would still be superior to that achievable under regulation if the information obtained *ex post* at trial would be better than that which a regulator could acquire and act upon *ex ante*.

These conclusions are reversed, of course, if the information possessed by a regulator is superior to private parties’ and the courts’; converse reasoning then shows that the use of direct regulation would be more attractive than liability.

⁴ See John Prather Brown, *Toward an Economic Theory of Liability*, 2 J. Legal Stud. 323 (1973).

The question that remains, therefore, is when we can expect significant differences in information between private parties and regulators to exist. And the answer is that private parties should generally enjoy an inherent advantage in knowledge. They, after all, are the ones who are engaging in and deriving benefits from their activities; in consequence, they are in a naturally superior position to estimate these benefits and normally are in at least as good a position to estimate the nature of the risks created and the costs of their reduction. For a regulator to obtain comparable information would often require virtually continuous observation of parties' behavior, and thus would be a practical impossibility. Similarly, the courts—when called upon under a negligence system—should have an advantage, though a less decisive one, over a regulator. One would indeed expect courts to adjust the due care level to take into account the facts presented by litigating parties more easily than a regulator could individualize its prior standards or modify them to reflect changed conditions.

Yet this is not to say that private parties or the courts will necessarily possess information superior to that held by a regulatory authority. In certain contexts information about risk will not be an obvious by-product of engaging in risky activities but rather will require effort to develop or special expertise to evaluate. In these contexts a regulator might obtain information by committing social resources to the task, while private parties would have an insufficient incentive to do this for familiar reasons: A party who generates information will be unable to capture its full value if others can learn of the information without paying for it. For parties to undertake individually to acquire information might result in wasteful, duplicative expenditures, and a cooperative venture by parties might be stymied by the usual problems of inducing all to lend their support.⁵ Continuing, once a regulator obtains information, it may find the information difficult to communicate to private parties because of its technical nature or because the parties are hard to identify or are too numerous. Thus we can point to contexts where regulators might possess better information than private parties to whom it cannot easily be transmitted, even if the usual expectation would be for these parties to possess the superior information.

The second of the determinants of the relative desirability of liability and regulation is that *private parties might be incapable of paying for the full magnitude of harm done*. Where this is the case, liability would not furnish adequate incentives to control risk, because private parties would treat losses caused that exceed their assets as imposing liabilities only

⁵ See generally Kenneth J. Arrow, *Essays in the Theory of Risk Bearing* (1971), ch. 6.

equal to their assets.⁶ But under regulation inability to pay for harm done would be irrelevant, assuming that parties would be made to take steps to reduce risk as a precondition for engaging in their activities.⁷

In assessing the importance of this argument favoring regulation over liability, one factor that obviously needs to be taken into account is the size of parties' assets in relation to the probability distribution of the magnitude of harm; the greater the likelihood of harm much larger than assets, the greater the appeal of regulation.

Another factor of relevance concerns liability insurance. Here the first point to make is that a party's motive to purchase liability insurance against damage judgments exceeding his assets will be a diminished one, as the protection will in part be for losses that the party would not otherwise have to bear.⁸ A party with assets of \$20,000 might not be eager to purchase coverage against a potential liability of \$100,000, as four-fifths of the premium would be in payment for the \$80,000 amount that he would not bear if he did not buy coverage. Hence, it might be rational for the party not to insure against the \$100,000 risk. If this is the case, then the assertion that liability does not create an adequate motive to reduce risk is clearly un rebutted.

Suppose, however, that the party does choose to purchase liability insurance covering losses substantially exceeding his assets or is required by statute to do so. What then is his incentive to take care? The answer depends on whether insurers can easily determine risk-reducing behavior—so that they can link the premium charged or the other terms or conditions of coverage to the party's precautions. Where this linkage can be established, the party's incentive to take care should be tolerably good. But if insurers find it too costly to verify insureds' efforts at risk reduction, then their incentives to take care may be insufficient; plausibly, they could be lower than if no insurance coverage had been obtained. Consider a requirement that the party facing a \$100,000 risk purchase full coverage against it and assume that the insurer cannot observe anything about the party's exercise of care. Then as the party would not have to pay a higher premium or be otherwise penalized for failure to take

⁶ See more generally Steven Shavell, *The Judgment Proof Problem* (1984) (unpublished manuscript, Harvard Law School).

⁷ The parties could be made to do this through the exercise of the state's police powers; force could be used to prevent a business from operating that disobeyed safety regulations. Where, however, monetary penalties are relied upon to induce parties to satisfy regulations, the fact that their assets are limited might lead to problems.

⁸ See William Keeton & Evan Kwerel, *Externalities in Automobile Insurance and the Underinsured Driver Problem*, 27 *J. Law & Econ.* 149 (1984); and Shavell, *supra* note 6.

proper care, he would have no reason to do this. Yet if he had not owned the liability coverage, at least his \$20,000 assets would have been at risk, supplying him with some motive to take care. Thus, it appears that the problem of inadequacy of incentives to take care which arises when parties' assets are less than potential harms can either be mitigated or exacerbated by the (mandatory or voluntary) purchase of liability insurance, depending on insurers' ability to monitor insureds.

An additional factor of relevance in considering the effects of inability to pay for harm done concerns firms and their employee decisionmakers. What is of special interest in this regard is that the activities of firms are prone to result in liabilities much larger than the assets of their employees—quite apart from whether firms themselves have assets sufficient to cover their liabilities.⁹ This means that employees' personal liability or ex post sanctions imposed on them of a firm's devise may not result in proper incentives to reduce risks; an employee with assets of \$50,000 might not take suitable precautions to reduce the risk of a \$1 million corporate liability if only his assets or his job is at stake.¹⁰ Hence, some sort of regulation of employees may be necessary to reduce risks appropriately.

But as firms themselves would wish to avoid large liabilities, they would have good reason to establish, *ex ante*, internal controls over the behavior of their employees. Thus we cannot conclude that there ought to be social regulation without supplying an argument for why it would be superior to a firm's own form of regulation. Now such an argument can be given in respect to the highest level of management—those individuals whose activities are overseen only by the board of directors and the shareholders—assuming that the board and the shareholders lack the time and the necessary expertise to control management's behavior as effectively as a regulator. This argument cannot be made, however, in respect to members of lower-level management, for they have superiors within the firm who presumably have better knowledge than a regulator and are thus able to set up a better scheme of *ex ante* controls. On the other hand, the desire of these superiors to regulate lower-level management might be inadequate precisely because the assets of the superiors could be less than the firm's potential liability. Thus, the situation is complex, but especially

⁹ For a general discussion of closely related issues, see Christopher D. Stone, *The Place of Enterprise Liability in the Control of Corporate Conduct*, 90 *Yale L. J.* 1 (1980); and see also Lewis A. Kornhauser, *An Economic Analysis of the Choice between Enterprise and Personal Liability for Accidents*, 70 *Calif. L. Rev.* 1345 (1982).

¹⁰ Risk aversion is a qualifying factor here. If the individual is sufficiently risk averse (and does not own liability coverage), he might still take adequate care; but beyond some magnitude of corporate liability—perhaps \$2 million if not \$1 million—the appropriate level of care would exceed that which the individual would be led to take.

in relation to the decisions of higher-level management we can see that there exist arguments in favor of social regulation independently of whether firms' assets are large enough to cover their liabilities.

Let us turn next to the third of the four general determinants, the chance that *parties would not face the threat of suit for harm done*. Like incapacity to pay for harm, such a possibility results in a dilution of the incentives to reduce risk created by liability, but it is of no import under regulation.

The weight to be attached to this factor depends in part upon the reasons why suit might not be brought. One reason that a defendant can escape tort liability is that the harms he generates are widely dispersed, making it unattractive for any victim individually to initiate legal action. This danger can be offset to a degree if victims are allowed to maintain class actions, whose application has problematic features, however. A second cause of failure to sue is the passage of a long period of time before harm manifests itself. This raises the possibility that by the time suit is contemplated, the evidence necessary for a successful action will be stale or the responsible parties out of business. A third reason for failure to sue is difficulty in attributing harm to the parties who are in fact responsible for producing it. This problem could arise from simple ignorance that a given harm or disease was caused by a human agency (as opposed to being "natural" in origin) or from inability to identify which one or several out of many parties was the cause of harm.¹¹

The problems here are aggravated when the potential liability rests on large firms, where complications analogous to those mentioned before exist. Namely, even if the harms can be attributed to an individual firm, the prospect of a successful suit may exert only slight influence on the behavior of corporate decisionmakers. With the passage of time, for example, there might be no clear way of determining which were the responsible employees, or those who were responsible may no longer be with the firm. The actual decisionmakers therefore may be beyond both the threat of suit and the prospect of sanctions internal to the firm.

The last of the determinants is the magnitude of the *administrative costs incurred by private parties and by the public* in using the tort system or direct regulation. Of course, the costs of the tort system must be

¹¹ Discussion of modifications of the tort system that would alleviate this problem of attribution—notably, imposing liability in proportion to the probability of causation—is beyond the scope of the present article. On this matter, see Comment, DES and a Proposed Theory of Enterprise Liability, 46 Fordham L. Rev. 963 (1978); David Rosenberg, The Causal Connection in Mass Exposure Cases: "Public Law" Vision of the Tort System, 97 Harv. L. Rev. 851 (1984); Steven Shavell, Uncertainty over Causation and the Determination of Civil Liability (1983) (unpublished manuscript, Harvard Law School).

broadly defined to include the time, effort, and legal expenses borne by private parties in the course of litigation or in coming to settlements, as well as the public expenses of conducting trials, employing judges, empaneling juries, and the like. Similarly, the administrative costs of regulation include the public expense of maintaining the regulatory establishment and the private costs of compliance.

With respect to these costs, there seems to be an underlying advantage in favor of liability, for most of its administrative costs are incurred only if harm occurs. As this will usually be infrequent, administrative costs will be low. Indeed, in the extreme case where the prospect of liability induces parties to take proper care and this happens to remove all possibility of harm, there would be no suits whatever and thus no administrative costs (other than certain fixed costs). Moreover, there are two reasons to believe that even when harm occurs administrative costs should not always be large. First, under a well-functioning negligence rule, defendants should in principle generally have been induced to take due care; injured parties should generally recognize this and thus should not bring suit. Second, suits should usually be capable of being settled cheaply by comparison to the cost of a trial. A final cost advantage of the liability system is that under it resources are naturally focused on controlling the behavior of the subgroup of parties most likely to cause harm; for because they are most likely to cause harm (and presumably most likely to be negligent), they are most likely to be sued.

Under regulation, unlike under liability, administrative costs are incurred whether or not harm occurs; even if the risk of a harm is eliminated by regulation, administrative costs will have been borne in the process. Also, in the absence of special knowledge about parties' categories of risk, there is no tendency for administrative costs to be focused on those most likely to cause harm, again because these costs are incurred before harm occurs. On the other hand, a savings in administrative costs can typically be achieved through the use of probabilistic means of enforcement.¹² But there is a limit to these savings because there is some minimum frequency of verification necessary to insure adherence to regulatory requirements.¹³

¹² See Donald Wittman, *Prior Regulation versus Post Liability: The Choice between Input and Output Monitoring*, 6 *J. Legal Stud.* 193 (1977), for a discussion of probabilistic enforcement in a setting similar to that of this article.

¹³ This minimum frequency of verification is determined by the maximum fine—the size of parties' assets—that can be paid for noncompliance. To induce a party with assets of \$10,000 to make a precautionary expenditure of \$500, for example, his compliance must be verified with a probability of at least 5 percent; for otherwise, even were the fine to equal his entire assets, the probability-discounted fine would be less than \$500. But if the likelihood of harm were negligible or lower than 5 percent, then under liability administrative costs could easily be smaller than under regulation, despite its probabilistic enforcement.

Joint Use of Liability and Regulation

Examination of the four determinants has thus shown that two generally favor liability—administrative costs and differential knowledge—and the other two favor regulation—incapacity to pay for harm done and escaping suit. This suggests not only that neither tort liability nor regulation could uniformly dominate the other as a solution to the problem of controlling risks, but also that they should not be viewed as mutually exclusive solutions to it. A complete solution to the problem of the control of risk evidently should involve the joint use of liability and regulation, with the balance between them reflecting the importance of the determinants.

If, then, some combination of liability and regulation is likely to be advantageous, two questions immediately arise: Should a party's adherence to regulation relieve him of liability in the event that harm comes to pass? On the other hand, should a party's failure to satisfy regulatory requirements result necessarily in his liability? Our theory suggests a negative answer to both questions.

As to the first, if compliance with regulation were to protect parties from liability, then none would do more than to meet the regulatory requirements. Yet since these requirements will be based on less than perfect knowledge of parties' situations, there will clearly be some parties who ought to do more than meet the requirements—because they present an above-average risk of doing harm, can take extra precautions more easily than most, or can take precautions not covered by regulation. As liability will induce many of these parties to take beneficial precautions beyond the required ones, its use as a supplement to regulation will be advantageous.¹⁴ At the same time, just because this is true, regulatory requirements need not be as rigorous as if regulation were the sole means of controlling risks.

A similar analysis is appropriate for the second question. If failure to satisfy regulatory requirements necessarily resulted in a finding of negligence, then some parties would be undesirably led to comply with them when they would not otherwise have done so. In particular, there will be some parties (*a*) who ought not to meet regulatory requirements because they face higher than usual costs of care or because they pose lower risks

¹⁴ To illustrate, suppose that a \$500 expenditure is desirable for typical firms to make to prevent \$1,000 in losses, but for atypical firms, an additional \$500 expenditure will prevent another \$1,000 in losses. If the regulator is unable to tell the atypical firms apart and tailor regulations to them, then only through the deterrent of liability will these firms be led to make the extra \$500 expenditure. Note, however, that use of liability alone would not be desirable, as then firms with low assets or ones likely to escape suit might not make even the first \$500 expenditure.

than normal and (b) who will not have been forced to satisfy regulatory requirements due to flaws in or probabilistic methods of enforcement. By allowing these parties to escape liability in view of their circumstances, the possibility that they would still be led to take the wasteful precautions can be avoided.¹⁵

III. ACTIVITIES CONTROLLED MAINLY BY LIABILITY: THE TYPICAL TORT

In this section and the next I will attempt to show that the theoretically desirable uses of tort liability and regulation correlate roughly with their uses in fact. In speaking first about activities controlled primarily by liability rules, I will for concreteness make reference to two activities mentioned earlier—to my chopping down a tree that might fall on my neighbor's home and to my running to catch a bus and possibly colliding with another person. A consideration of the relevance of the four determinants to activities such as these will suggest strong advantages of the liability system and acute drawbacks of regulation.

As regards the first determinant, there is ample reason to believe that private parties would possess much better information about risks and whether and how to reduce them than would a regulator. Because I would know the precise position of my tree and of my neighbor's home, I would likely have superior insight into the chance of an accident and the opportunity to lower it by use of guy wires, or by cutting down the tree in stages. Likewise, I would presumably be better able to determine whether I should do the work myself or hire an independent contractor to do it. Similarly, my knowledge of the probability of knocking someone down when running for a bus at that particular corner under these particular conditions of visibility and weather would be better than a regulator's, and I would surely know more about the importance of catching the bus.

In these situations private parties possess the better information because they apparently do obtain it as an ordinary by-product of their

¹⁵ Suppose that, unlike in note 14 *supra*, the atypical parties ought not to make the first \$500 expenditure because for them it would not reduce losses at all. Then, assuming that the regulator is unable to identify atypical parties, a single regulatory standard must be used, and suppose that it corresponds to the \$500 expenditure (as the typical parties for whom this is appropriate are so numerous). Now consider the question whether an atypical party who for some reason was not made to satisfy the standard should be found negligent for that, if he happens to cause an accident. Clearly, if such an atypical party were not found negligent, then he would not make the \$500 expenditure, the desirable result; but if he were found negligent, he might be led to make the expenditure. Hence it is best for atypical parties to escape liability for negligence if they did not adhere to the regulatory standard. (And note again that the use of liability alone would not be desirable, for without regulation typical parties with low assets or who would escape suit would fail to make the \$500 expenditure.)

activities and can take into account the changes in circumstance that influence the risks and the value of their activities. Consequently, parties should make reasonably satisfactory decisions under liability, while costly mistakes would be unavoidable under regulation. Were the regulatory authority to set forth rules on the felling of trees or the pursuit of buses, it is a certainty that the rules would sometimes be too restrictive, imposing needless precautions that would not be taken due to a concern only over liability; conversely, the rules would fail to identify desirable precautions that parties would obviously be motivated to take to avoid liability.

Turning next to the ability to pay for harm done, there is admittedly a potential problem, but sometimes not one of great magnitude. The damage to my neighbor's roof, for example, will probably be limited in scope, and I am likely to have assets plus liability insurance sufficient to cover it whether I own or rent my house. While inability to pay for harm counts as a weakness of liability in respect to the typical tort, it does not stand out as a problem of unusual dimension, at least by comparison to many of the situations to be discussed in the next part of the article.

The likelihood that suit would be brought against a liable defendant, moreover, appears to be relatively high for the typical tort, as none of the reasons for failure to bring suit seems to apply. Harms generally will not be dispersed among victims; my tree will fall on one, not many, roofs; I will collide with one or at most several pedestrians. Harms will not take a long period of time to manifest themselves; rather, any injury that I cause to a pedestrian or any damage to my neighbor's roof will be an immediate and direct consequence of my behavior. Further, harms will normally be readily attributed to responsible parties; there will be no mystery over whose tree damaged my neighbor's roof or over how the damage came about. There is thus no argument favoring regulation for fear that proper defendants would systematically escape suit.

Finally, liability should enjoy a significant administrative cost advantage over regulation in controlling the risks of typical torts. One does have the impression that it should be much less costly for society to incur administrative costs only when falling trees happen to descend on neighbors' homes and only when individuals chasing buses happen to collide with pedestrians, fairly unlikely events, than for society to formulate and enforce regulations on when and how trees may be cut down and on when individuals may be allowed to hurry after a bus.¹⁶ Indeed, virtually all our

¹⁶ Suppose, for instance, that the likelihood of my tree's striking my neighbor's roof is 0.1 percent; that should this happen, the chance there would be a dispute over my negligence is 50 percent; that given this, the probability of a settlement before trial would be 75 percent;

routine activities—walking, mowing a lawn, playing catch—are perfectly innocuous in the overwhelming majority of instances, so that the savings achieved by limiting the bearing of administrative costs to those few occasions when harm occurs must be great.

The notion of effective regulation of the activities of everyday life even seems fanciful to contemplate, particularly because it would necessitate the use of extremely frequent and intrusive verification procedures. This is because what would usually need to be determined by a regulatory authority are aspects of modifiable behavior rather than “fixed” physical objects. While it may be enough to inspect elevator cables annually, because their condition will change little over that period, effective regulation of ordinary behavior such as whether I chase after buses clearly requires much more frequent monitoring.

Also of importance is the tendency for administrative costs to be incurred primarily in controlling the parties most likely to cause harm. Because those who fail to prevent their trees from falling on their neighbors’ roofs must be a disproportionately awkward group, it is a good thing that the liability system’s costs be concerned only with them; it would be a waste for society to incur costs to monitor the majority of careful individuals whose trees fall safely to the ground; yet that is just what the regulatory approach requires.

Let us now summarize our discussion. Of the four determinants, differential knowledge and the size of administrative costs pointed strongly in favor of use of liability to reduce the risk of the typical tort, while inability to pay for harm done worked with only moderate force against it, and the possibility of escaping suit did not constitute an argument against it. Thus, the use in practice of liability to control the familiar category of risks known as torts seems to be the theoretically preferred solution to the problem.

IV. ACTIVITIES SUBJECT TO SIGNIFICANT REGULATION

This section will argue that it is desirable that society resort to safety regulation where it generally does—in controlling the risks of fire, the production and sale of many foods and drugs, the generation of pollu-

that the administrative costs of a settlement would be \$100 and those of a trial \$1,000. Then the likelihood of a dispute ending in settlement would be 0.0375 percent, of one ending in litigation 0.0125 percent, so that the expected administrative costs associated with my chopping down my tree would be $.000375 \times \$100 + .000125 \times \$1,000$, or about 16 cents. It is hard to think of any regulatory scheme that could, *ex ante*, verify satisfaction of safety requirements at comparable cost.

tants, and the transport and use of explosives and other dangerous materials. A consideration of the four determinants in these areas will lead to the conclusion that substantial regulation is not a coincidence but rather is needed, both because liability alone would not adequately reduce risks and because the usual disadvantages of regulation are not as serious as in the tort context.

First, what typifies much of regulation in the areas of concern is that its requirements can be justified by common knowledge or something close to it. Presumably most of us would agree that it is well worthwhile for explosives to be transported over designated routes that avoid the drastic risks of explosions in tunnels or in densely populated locations; that expenditures on very strong elevator cables are warranted by the resulting reduction in the probability of fatal accidents; that milk should be pasteurized to decrease the chances of bacterial contamination. In these and similar cases, the regulatory authority can be reasonably confident that its requirements are justified in the great majority of situations. To be sure, they will not always be justified; there will be some occasions when milk will be consumed soon enough that failure to pasteurize it would lead to no significant risk. But these occasions will be few in number, and the error due to inappropriate regulation will be small.

Furthermore, even where the proper design of regulation must be based on much more than common knowledge, the regulatory authority may not suffer an informational disadvantage, but instead may enjoy a positive advantage relative to private parties. Notably, in dealing with many health-related and environmental risks, a regulatory agency may have better access to, or a superior ability to evaluate, relevant medical, epidemiological, and ecological knowledge. A small fumigating company, for example, might know little about, and have limited ability to understand, the nature of the risks that the chemicals it uses create. The same might be true of a large producer of pesticides; it may be uneconomical for the producer to develop and maintain expert knowledge about the dangerous properties of pesticides, especially where there are economies of scale in acquiring this knowledge and where it would benefit others.

Consideration of the determinant concerning inability to pay for harm done also suggests why we regulate the activities that we do. A fire at a nightclub or hotel could harm a large number of individuals and create losses greater than the worth of the owner. The harm caused by mass consumption of spoiled food or by inoculation with vaccines with adverse side effects could easily exhaust the holdings of even a large corporation, and so too with the losses resulting from explosions, oil spills, or the release of toxic agents or radioactive substances. Clearly, in many areas of regulation, potential liability could exceed the assets of the firms in-

volved (certainly of their employees), and the deterrent effect of tort law is therefore diluted.

Deterrence is similarly diluted by the likelihood that responsible parties would not be sued for a wide class of environmental and health-related harms. Many of these harms are sufficiently dispersed that individual victims do not find it worth their while to bring suit. In addition, these harms often become apparent only after the passage of years, either because ecological damage or the disease process itself is slow (as with asbestosis) or because the substance generating the risk retains its potency for a long period (as with anthrax bacillus or radioactive wastes). In consequence, it may be difficult for victims to assemble the evidence necessary to succeed in a suit, the responsible individuals may have retired or died, or the firms themselves may have gone out of business. Last, it is frequently hard to trace environmental and health-related harms to particular causes and then to particular firms. Many different substances may combine to produce a given type of harm, and the mechanism that links cause to effect may be complex and incompletely understood. There are, then, a variety of reasons to believe that parties responsible for environmental and health-related harms would not be sued, and hence to find the use of regulation attractive.

Finally, regarding administrative costs, several factors may offset the underlying advantage of liability in the major regulated areas. First, what regulation often requires is the presence of particular safety devices—fire extinguishers, guard rails, lifeboats—making enforcement less costly than if regulation demanded particular modes of behavior. And where regulation does demand a type of behavior, there may be features of the situation making lack of compliance hard to conceal. How easy would it be for a dairy to keep secret its failure to pasteurize milk when samples can be tested at low cost and when numbers of employees would be aware of the violation? Second, probabilistic methods of enforcement of regulation are often employed; firms are subject to spot visits by regulatory authorities; products and services are randomly selected and examined. Thus, the administrative costs of verifying adherence to regulatory requirements appear sometimes to be low per party, while other times some savings are realized by verifying compliance on a probabilistic basis.

We conclude that the importance of the four determinants is different for the major regulated areas from what it is for the typical tort. In the regulated areas, there is a larger likelihood that responsible parties will be unable to pay for or will escape detection and suit for harms that they bring about; and the disadvantages of regulation involving administrative costs and differential knowledge are less troublesome. Of course, the relative weights of these determinants will change from one case to the

next—the possibility of escaping suit, for example, is of significant concern for harms due to pesticides although of little concern for damage caused by fire. But the overall balance of the determinants in the various cases should indicate the desirability of substantial regulation.

This general claim of theoretical consistency is further supported by considering the “second-order” choices society has made over which *aspects* of an activity to regulate given the initial choice that the activity is one that should be subject to important controls. While fire regulations will often contain requirements concerning the installation of smoke alarms and sprinkler systems, they inevitably will not cover many routine practices, such as whether to store flammable furniture polish in a closet through which a heating pipe passes. Regulating these practices would usually be very expensive (closets would have to be checked frequently) or require a highly contextual sort of knowledge (type of polish and of heating pipe). It therefore appears that the two disadvantages of regulation—the magnitude of administrative costs and the regulator’s inferior information about risk—help explain what aspects of a regulated activity are left unregulated.

The claim of theoretical consistency is also confirmed by the observed interrelationship between regulation and imposition of liability, especially in the basic rule that compliance with regulation does not necessarily relieve a party of liability.¹⁷ Moreover, the cases often say that it is “unusual circumstances” or “increased danger” that makes additional precautions desirable, which is exactly what our theory suggested ought to give rise to liability despite satisfaction of regulation.¹⁸ Similarly, the failure to conform to regulation does not in fact automatically result in liability.¹⁹ And the explanation that is furnished here—that a party’s “violation of the [statutory] law” does not imply his negligence if the special circumstances justify the apparent disobedience—again comports with the theory.²⁰

¹⁷ See William L. Prosser, *Handbook of the Law of Torts* (4th ed. 1971), at 203.

¹⁸ See *id.* at 204. Also, at 203, Prosser writes, “The statutory standard is no more than a minimum, and it does not necessarily preclude a finding that the actor was negligent in failing to take additional precautions. Thus the requirement of a hand signal on a left turn does not mean that . . . a driver . . . is absolved from all obligation to slow down, keep a proper lookout, and proceed with reasonable care.” This statement is in perfect agreement with our explanation from Section II, *supra*, where we said that the statutory standard ought to be regarded as a minimum since there would be parties who ought to take greater care and would not do so were they to escape liability on account of simply complying with the statutory standard.

¹⁹ *Id.* at 197.

²⁰ *Id.* at 198. At 198 and 199, Prosser writes that “it has been held not to be negligence to violate . . . a statute because of physical circumstances beyond the driver’s control, as

V. CONCLUDING COMMENTS

a) The basic purpose of the last two sections of this article has been to demonstrate how the observed use of liability and regulation can be explained by looking to the four determinants discussed at the outset. As would be true of any simple theory, however, the fit between the theory presented here and reality is only approximate.

Indeed, we often encounter the view that major mistakes have been made in the use of liability and regulation. On the one hand, it may be asserted that regulation has proved inadequate, as for instance in controlling the disposal of toxic wastes. This particular claim may well have merit, for until recently toxic wastes were little regulated, while the threat of tort liability probably provided an insufficient deterrent against improper disposal—due to manifold problems faced by victims in establishing causation and to the possibility that responsible parties would be unable to pay for harm done.²¹ Conversely, there are frequent charges that certain regulations are too restrictive, as in complaints that various OSHA requirements and antipollution standards are unduly constraining or impose excessive costs on industry.²²

That there are such examples of apparent social irrationality is to be expected, for the choices actually made about regulation and liability are obviously influenced by factors lying outside the framework of this analysis, and in any event often will not reflect a conscious, careful use of a cost-benefit calculus. Moreover, the complexity of the relationship between liability and regulation and the many unanswered empirical questions also afford ready explanations for differences between observed and ideal results.

b) The theoretical determinants examined here would be of relevance to

where his lights suddenly go out on the highway at night Another valid excuse is that of emergency, as where one drives on the left because the right is blocked, or a child dashes to the street" Such results obviously agree with what we said in Section II. That is, we do not want the driver to stay on the right-hand side of the road when the child dashes out; holding him liable for being on the left would give him a socially undesirable incentive to drive on the right.

²¹ See, for example, Note, Allocating the Costs of Hazardous Waste Disposal, 94 Harv. L. Rev. 584 (1981) and references cited therein; Richard A. Epstein, The Principles of Environmental Protection: The Case of Superfund, 2 Cato J. 9 (1982); and "Public Threat Feared in Loopholes in Laws on Toxic Waste Dumping," New York Times, June 6, 1983, at 1.

²² See, for example, Stephen Breyer, Regulation and Its Reform (1982), ch. 14; Albert L. Nichols & Richard Zeckhauser, Government Comes to the Workplace: An Assessment of OSHA, 49 Public Interest 39 (1977); and, for a general introduction to the issues, ch. 5 of Environmental Law and Policy (Richard B. Stewart & James E. Krier eds. 2d ed. 1978).

a more comprehensive analysis of the social control of risk, and specifically to one allowing for the use of public fines measured by harm done,²³ and of the private right to enjoin others from engaging in harmful activities. The general conclusions that would emerge from such an analysis seem clear.

First, the fine is identical to liability in that it creates incentives to reduce risk by making parties pay for the harm they cause. Thus the fine enjoys essentially the same advantages as liability rules—the private parties balance the costs of reducing risks against the benefits, while society bears administrative costs only when harm occurs. Also, the fine suffers from similar disadvantages—inability to pay for harm done dilutes its effectiveness, as does the possibility that violators would escape detection.

But the fine differs from liability in its public nature; private parties do not institute suits to collect fines nor benefit financially when they are paid. The principal implication of this difference is that the likelihood of imposition of a fine may be less than the likelihood of a private suit. Private parties should ordinarily be more likely to know when harm occurs than a public agency and, as just observed, will not profit from reporting harm but may from bringing suit. Nevertheless, in some circumstances the advantage may lie with the fine. A fine could be imposed where suits would not be brought due to difficulty in establishing causation or where harms are widely dispersed, as in many environmental and health cases.

The injunction, unlike the fine, resembles safety regulation, for it works in a direct way to control risk; the injunction prevents harm simply by proscribing certain behavior. Hence the injunction shares the main advantages of safety regulation. Its use is in no way impeded by the possibility that a party would not be able to pay for the harm he does,²⁴ or by the chance that the harm would be highly dispersed or hard to attribute to him under tort principles. Just as, for instance, the regulation of nuclear power plants might be justified by both these factors, so too might enjoining their operations in certain circumstances.

The injunction, however, differs from safety regulation in that it is brought at the behest of private parties. The injunction accordingly has an advantage where private parties would have superior information about

²³ Thus, from the point of view of parties who pay fines, it is as if they were strictly liable for harm done.

²⁴ This point is made in Robert C. Ellickson, *Alternatives to Zoning: Covenants, Nuisance Rules, and Fines on Land Use Controls*, 40 U. Chi. L. Rev. 681 (1973).

the harm they might suffer, as is perhaps true of ordinary nuisances. But safety regulation would be more attractive where parties are not easily able to assess dangers or where many parties are involved and "free rider" and associated problems make it difficult to coordinate a collective action.

As this discussion indicates, the injunction and safety regulation may be viewed as substitutes, but not perfect ones, and similarly with the fine and liability. Thus, although an analysis of all four methods of controlling risk would be complicated, the conclusions would parallel our own. Where the theoretical determinants had indicated a relative advantage of regulation over liability, they would now indicate an advantage of regulation or the injunction over liability or the fine.