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MEASURING THE SHADOW OF PUNITIVE DAMAGES: THEIR EFFECT ON BARGAINING, LITIGATION, AND CORPORATE BEHAVIOR: ARTICLE: PRODUCT LIABILITY, PUNITIVE DAMAGES, BUSINESS DECISIONS AND ECONOMIC OUTCOMES

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**SUMMARY:**

... The U.S. product liability system--and the role of punitive damages within that system--is very controversial. ... Product safety is a fundamental element of the economics and economic efficiency of product liability and punitive damages policy. ... Product liability is of policy concern primarily for industries whose products are believed to have significant potential for causing injury. ... Mass torts and punitive damages illustrate the very important fact that product liability risk can be reasonably viewed by managers as essentially unlimited. ... Let us now use this framework for thinking about company decisionmaking to consider various ways that attempts to influence manufacturer behavior with product liability and punitive damages may work out badly. ... I then argue that a particular type of uncertainty about standards of behavior for avoiding product liability or punitive damages is likely to be particularly counterproductive with regard to the deterrence goals of the legal environment. ... Product liability costs can be very unpredictable at the time that decisions must be made, thus confronting decisionmakers with liability risk. ... Liability may, for example, deter some companies from ignoring safety problems or concealing them from the FDA; if so, this strengthens deterrence of behavior that is likely to be inefficient. ... These accounts also provide insight into the nature of perceived product liability risk within the industry. ...

**TEXT:**

[\*237]

I. Introduction

The U.S. product liability system--and the role of punitive damages within that system--is very controversial. Much of

the controversy is about effects on the economy, a very complex subject. This Article aims to help the reader think systematically--and with empirical grounding--about the economic effects of product liability and punitive damages. For convenience in exposition, the term "the legal environment" is often used to refer to "product liability including punitive damages." As used here, the term "economic effects" refers to effects on the current and future well-being of U.S. residents--Amembers of society"--in the aggregate. As explained in Part II, economists refer to aggregate well-being as "economic efficiency." I digress to address three common sources of misunderstanding.

First, economic efficiency is not a fancy term for "what's good for business." Since consumers are members of society, consumer interests are squarely within the scope of economic efficiency. But because members of society are also workers, effects on their well-being operating through business are also within that scope.

Second, effects on product safety are one type of economic effect of product liability. Because product-related injuries lessen the well-being of members of society, economic effects--properly understood--include the social costs of product-related injuries, broadly interpreted. Thus, for example, physical and emotional pain and suffering from injuries are part of the economic effects, as are effects more commonly thought of as [\*238] "economic" such as costs of treating injuries and lost productivity of injured people.

Third, even economists do not believe that economic effects should be the only concern in making policy. For example, aggregate economic well-being ignores distribution of well-being among different members of society, and most economists believe that distribution is a legitimate policy concern. Most economists also believe, however, that even when policy is motivated by redistribution, it is worthwhile to examine the economic efficiency consequences and to consider whether the same or better redistributive ends can be achieved along with the same or better efficiency effects.

To explore economic effects of the legal environment, this Article focuses on a crucial issue: how this environment affects decisions of manufacturers and, in turn, economic outcomes of concern to society. Thus, the focus is on how--and how well--product liability and punitive damages serve the deterrence function that is said to be among their central purposes. Adopting this focus sets aside other goals ascribed to product liability and punitive damages, for example, compensation and--as is more common with punitive damages--punishment or retribution. Even those who care about product liability and punitive damages primarily or exclusively for reasons other than deterrence should be interested in the economic effects of punitive damages because members of society care about economic effects and because these effects are accorded considerable weight in the policy process.

It seems widely appreciated that analyzing economic effects of product liability--and the role of punitive damages--is challenging. Nonetheless, it is considerably more challenging than most people realize. This is because many potential effects on business decisions and economic outcomes of central concern cannot be observed or measured, and because analyzing effects of potential reforms requires knowledge about much more than effects of past and present legal environments. Consider these points in turn.

Many of the most important potential effects of product liability cannot be seen or measured. Such effects include discouragement of innovation, as is often claimed by reform advocates seeking to reduce liability exposure of manufacturers. Deterrence of dangerous corporate behavior, as is often claimed by those defending the status quo, also cannot be seen or measured.

Most proponents of reform emphasize social costs of the prevailing system, and opponents of reform emphasize social benefits. However, the fundamental question--how economic outcomes would differ under alternative liability regimes--involves much more than the costs and benefits of the prevailing system. Most proposed changes in liability arrangements have not been tried, and thus there can be no direct [\*239] empirical information about the economic outcomes that would prevail if particular reforms were enacted.

In sum, sole reliance on direct measurement or estimation of effects of the legal environment on business decisions

and economic outcomes will inevitably cause us to ignore several central concerns. Thus, usefully broad analysis must involve large doses of inference.

For inferences about effects on business decisions to be reliable and influential, they must rest on an explicit and empirically grounded conceptual foundation. Parts II and III present the conceptual (theoretical) underpinnings for empirical analyses and inferences reported in Parts IV and V.

More specifically, Part II offers a conceptual view of how business decisions respond to the threat of product liability and punitive damages. Within this framework, the legal environment alters incentives of business decisionmakers by introducing potential liability costs of various types. To understand how potential liability costs affect decisions, however, we must also consider: (1) incentives stemming from consumer behavior and administrative safety regulation; (2) how decisionmakers perceive the risks posed by the legal environment; and (3) how decisionmakers respond to the risks they perceive. I use various types of empirical information to develop this framework, including observation of liability outcomes and diverse literature in economics, psychology and management.

Many observers are concerned about detrimental economic effects of product liability and punitive damages, and Part III shifts the theoretical discussion to normative or evaluative issues. It describes different ways the legal environment can push business decisions in socially undesirable directions. It proposes a taxonomy of deterrence pitfalls and uses claims about detrimental economic effects to illustrate these pitfalls. Part III closes by considering a feature of the legal environment that appears especially counterproductive--unpredictability about the standards of behavior to which manufacturers will be held.

The conceptual framework provides several reasons to expect that the economic effects of product liability and punitive damages will differ substantially across industries and even across product areas within some industries. Parts IV and V review empirical analyses and conclusions that illustrate such differences.

Part IV considers prescription pharmaceuticals and medical devices, relying primarily on my 1993 RAND Institute for Civil Justice study. n1 [\*240] Broadly stated, this study concluded that the legal environment induces a mixture of socially desirable and socially undesirable economic effects and that punitive damages play an important role in both. This part also considers an important issue that has emerged more recently: difficulties experienced by manufacturers of implantable medical devices in obtaining biomaterials needed to develop and make their products.

Part V describes work in progress aimed at understanding economic effects of product liability and punitive damages in the automobile industry. The conceptual framework and empirical information previously reported by others suggest that potential mass media reporting of product liability verdicts--including punitive damages awards--may play a central role in the actual and perceived incentives of manufacturers. Part V presents a summary of empirical analyses of the determinants of the extent of newspaper and television reporting of verdicts in automobile product liability cases. Punitive damages are found to play a prominent role in determining the extent of mass media coverage.

Part VI reviews the major conclusions from the previous sections, emphasizing the role of punitive damages. Seven simple, but powerful, lessons about the economic effects of punitive damages--and product liability generally--are offered and discussed. I then step back and consider what these lessons suggest about the quality of the policy debate about economic effects of product liability and punitive damages and how this debate might be improved.

## II. Conceptual Bases for Analyzing Economic Effects

This part discusses economic outcomes of social concern that are in principle sensitive to product liability and punitive damages. It then explains economic efficiency, which is one way to conceptualize socially appropriate balancing of different outcomes, and introduces a general conceptual framework for analyzing economic effects of product liability

and punitive damages on company decisions. This part concludes by assessing the crucial role of liability risk and how it is perceived by company decisionmakers.

#### A. Social Stakes in Deterrence Go Beyond Safety

Debates about effects of the legal environment are often so fractious that different participants seem to be describing different systems. Much confusion stems from unstated disagreement about social goals.

Product safety is a fundamental element of the economics and economic efficiency of product liability and punitive damages policy. But the social stakes--and, indeed, the consumer stakes--include more than safety. This is because increasing product safety often requires sacrificing [\*241] other things of value to society in general and consumers in particular. As a result, many would not want to live with the consequences of pursuing maximum safety. n2 Almost everyone would agree, for example, that making knives too dull to cut or cars too slow for crashes to cause serious injury would not be desirable despite the safety benefits. Moreover, some increases in safety that wouldn't lessen product usefulness would increase product costs and prices by more than most consumers would think worthwhile.

Not everyone agrees that economic effects of product liability other than effects on safety are relevant. Rarely are differences in goals addressed directly. A notable exception is Pamela Gilbert, former Director of Congress Watch, commenting on my 1993 RAND Institute for Civil Justice study n3 : "The goal of the policy recommendations in the Rand study is economic efficiency, not maximum safety. In contrast, we approach the issue of product liability from a consumer protection perspective, not an economic one." n4

Such explicit statements of goals can improve the policy debate by helping to isolate the sources of disagreement. n5 As emphasized below, for example, punitive damages policies that could be sensible if safety were the only concern can be disastrous if other economic outcomes are also of social concern.

#### B. Economic Efficiency Encompasses Safety and Other Social Goals

Those who seek to pursue safety along with other economic concerns--and strike a socially desirable balance--would want liability to push decisionmakers to increase safety, but only in some ways and only so far. Economic efficiency is the way economists conceptualize striking such a balance.

When policy is considered from a national perspective, as is assumed throughout this Article, economic efficiency refers to the aggregate (or [\*242] average) levels of current and future standards of living of U.S. residents. n6 Any outcomes that U.S. residents care about are relevant in proportion to how many of these members of society care about these outcomes and how highly they value them. Changes in policy generally involve a mixture of effects that members of society judge desirable (i.e., "social benefits") and effects that members of society judge undesirable (i.e., "social costs"). Policy-induced changes in economic outcomes enhance economic efficiency to the extent that the social benefits of these changes exceed their social costs.

According to the economic-efficiency criterion, increases in safety involve social benefits to the extent that members of society in the aggregate value those increases in safety. Any required sacrifices--e.g., higher design and production costs, reduced product usefulness, lost innovation--involve social costs according to the values that members of society (in the aggregate) place on those sacrifices. n7 The efficient level of safety, i.e., the optimal level when economic efficiency is the goal, involves a delicate balancing of costs and benefits. In particular, safety is at its optimal level when any small increase in safety--from any and all means--involves social benefits just equal to the associated social costs. n8

Other principles for balancing outcomes of social concern might lead policy makers to seek different optimal or target levels of safety. Whatever the social goal and the associated target safety level, the social benefits and costs of liability and punitive damages policies depend on how manufacturers respond to different legal arrangements.

[\*243]

### C. The Legal Environment Affects Business Behavior Within a Complex System of Incentives

Many of the outcomes of social concern are driven by decisions of manufacturers. In order to analyze economic effects of liability and punitive damages on these outcomes, then, we need to consider effects on business decisionmaking.

#### 1. various company incentives to improve product safety

Figure 1 in the Appendix depicts a framework for analyzing how product liability and punitive damages affect economic outcomes of social concern through their effects on business decisions. Examining the figure from right to left, the economic efficiency of an industry depends on industry-level outcomes such as those emphasized in the policy debate: product availability, price, product safety, product effectiveness, and innovation. These outcomes are determined largely by decisions of manufacturers, who are assumed to have profit as their primary objective. Decisions depend on how company decisionmakers perceive their incentives--including risks posed by liability and punitive damages--and by decisionmakers' attitudes toward taking risks. Product liability affects incentives and risks within a decisionmaking environment that is also shaped by market forces and public regulation of product safety.

Punitive damages, then, are only one aspect of the liability part of a complex incentive system determining the economic outcomes of social concern. Given the focus of this special issue, in this Article I pay particular attention to punitive damages. It is crucial, however, to keep in mind that the effects of punitive damages cannot be understood in isolation from the roles played by other parts of the system.

Potential product liability costs--including punitive damages--affect company decisions because, other things being equal, liability costs reduce profits. The most obvious costs of liability are "direct liability costs." These include costs involved in: (1) responding to, negotiating and settling claims that don't involve lawsuits; (2) defending suits; (3) negotiating and paying settlements; and (4) paying awards. For some companies, some direct costs are covered by commercial insurance. But the existence of commercial product liability insurance hardly makes direct liability costs irrelevant. Large companies tend to be self-insured (i.e., uninsured) for product liability. In addition, liability costs paid or reimbursed by insurance companies are costly to insured companies because adverse liability experience is likely to lead to higher insurance premiums--or lack of insurance coverage--in the future. Moreover, [\*244] punitive damages payments are not insurable or are only partially recoverable in many states. n9

Avoiding liability costs is not the only--or even necessarily the primary--incentive for companies to invest in product safety. As depicted in Figure 1 in the Appendix, both market forces and product-safety regulation can play important roles.

Market forces--what potential customers desire and how much they are willing to pay--are a fundamental determinant of manufacturer decisions regarding product design, availability, pricing, innovation, and the like. It seems under-appreciated, however, that market forces can also provide substantial incentives for enhancing product safety. To the extent that buyers care about safety and can distinguish between more and less safe products, it would be profitable--even absent any public mechanism--for companies to incur costs to improve product safety. The extent to which buyers can evaluate safety varies considerably across products. Hence both the scope for policy interventions (i.e., regulation or liability) to increase safety in efficient ways and the effects of actual policy interventions differ from industry to industry and even across products within industries.

Administrative product safety regulation is also crucial. Product liability is of policy concern primarily for industries whose products are believed to have significant potential for causing injury. Such products or industries are subjected to administrative regulation. Federal agencies with responsibility for product safety--which include the Food and Drug Administration (FDA), the National Highway Traffic Safety Administration (NHTSA), the Environmental Protection Agency, the Consumer Product Safety Commission, and the Federal Aviation Administration--regulate

products from different industries, to widely differing degrees, using substantially different forms of regulation. n10 Differences in extent and form of regulatory oversight across different products are a leading reason we should expect that the scope for liability to improve matters and the effects of actual product liability policies will differ substantially across products and industries.

[\*245]

## 2. indirect effects and indirect costs of liability

Figure 2 in the Appendix adds to Figure 1 elements that seem crucial for analyzing some industries, for example, automobiles. Specifically, this figure adds effects of liability that operate indirectly by causing costs to companies in the market and regulatory spheres. Such "indirect liability costs" are not insurable. The figure also points to the potentially crucial role of mass media reporting in the process. n11

Events in the liability sphere--such as suit filings, settlements, and various court outcomes--may impose indirect costs on a company by triggering regulatory events such as product recalls or agency enforcement actions. n12 Often, it seems, mass media attention plays a key role in arousing attention from Congress, regulators or regulatory staff. The possibility that liability events will fuel costly regulatory actions fortifies company incentives to avoid liability events.

Moreover, incentives to avoid liability actions and events may be strengthened further by the possibility that liability (and regulatory) events lead to costly market responses. n13 For example, a verdict against a manufacturer may trigger mass media attention, undermine consumer confidence in the safety of the product involved or--if punitive damages are involved n14 --undermine consumer confidence in the trustworthiness [\*246] of the company, thereby reducing the demand for the product involved in the verdict or even the company's products more generally. n15

## D. Unpredictable Liability Outcomes and Liability Risk

When companies make decisions--e.g., to design, manufacture, market and label a product in a particular way--the liability consequences often unfold over the course of several years. n16 Often, liability consequences can be predicted with very little precision or confidence. Here I use the terms "uncertainty" and "unpredictability" interchangeably to refer to lack of knowledge about eventual outcomes.

Uncertainty or unpredictability figures prominently in almost all discussions of the U.S. product liability environment. Unpredictability of eventual liability costs stems from many sources, including: unforeseen product hazards; complexity of and inter-jurisdictional variation in doctrine; lack of doctrinal precision and the potential for doctrinal change over time; variability in behavior of injured product users, attorneys, judges, and juries; changes in social attitudes towards litigation and compensation; and unknown future capabilities for determining injury causation.

[\*247]

### 1. liability risk

Because liability involves potential costs--and not rewards--the crucial aspect of uncertainty is risk; i.e., potential for loss. n17 The term "liability risk" is used here to refer to potential for liability costs, direct and indirect, encompassing both the likelihood and magnitudes of such costs. n18

The management literature provides a substantial basis for predicting how liability risk is perceived by company decisionmakers and what their responses will be. March and Shapira, considering business risk generally, write: "for these managers, risk is not primarily a probability concept" n19 and report that when asked to evaluate risks, eighty percent of the executives interviewed for a 1986 study by Shapira n20 "asked for estimates of the 'worst outcome' or the 'maximum loss.[fcM]" n21 Threats to firm survival are particularly important: "Over 90% of the executives interviewed by Shapira said they would not take risks where a failure could jeopardize the survival of the firm." n22

While companies are willing to make major sacrifices to avoid large risks and especially threats to firm survival, companies will take large risks in some circumstances. Specifically, March and Shapira write: "The acceptability of a risky alternative depends on the relation between the dangers and opportunities reflected in the risk and some critical aspiration levels ... The most frequently mentioned values are a target level for performance (e.g., breakeven) and a survival level." n23 Because risks are unavoidable, business decisionmakers seek to manage risk. n24 Risk-management may involve changing decisions or making contingency plans.

In the product liability context, a decision process consistent with these ideas can be sketched as follows. When potential liability is considered at all, liability potential is assessed for a contemplated action (decision) that otherwise seems attractive, for example, marketing a particular product with a particular set of warnings. If liability risk is not [\*248] considered substantial, the action is taken. Otherwise, the company searches for ways to reduce the liability risk (e.g., by changing the product design, manufacturing process or warnings). If this search yields a modified action without substantial perceived liability risk, the modified action is taken. If no such modified action is found, the company considers whether the prospects for gain from the (original or modified) action justify bearing the perceived liability risk. n25 If not, and a satisfactory alternative can be found, the action may not be taken at all (e.g., the product might be withdrawn from the market). n26

## 2. mass torts, punitive damages, unlimited risk and worst-case scenarios

In analyzing the effects of the legal environment on business decisions, risk is critical because, under some circumstances, product liability and punitive damages can involve extremely large risks. In industries such as medical products and chemicals, mass torts and company bankruptcy are very salient because they have occurred. Whether or not mass torts or bankruptcy are salient, punitive damages are likely to be a part of a company's worst-case scenario in many industries because they are not limited in amount in any instance and--in the product liability context--punitive damages can be assessed multiple times for the same behavior.

Mass torts and punitive damages illustrate the very important fact that product liability risk can be reasonably viewed by managers as essentially unlimited. This makes liability risk fundamentally different from most other business risks. For example, when an R'D project fails, only the entire investment in the project is lost. With product liability, the worst-case scenario can be much worse. A particularly bad liability experience with a product can lead to costs that represent a large fraction of a company's value--and in the extreme may lead to financial [\*249] disaster--no matter how small a portion of its assets was invested in the product.

### E. Perception of Liability Risk

Decisions are driven by perceptions, and decisionmakers may substantially misestimate the liability potential of various products or decisions. This is because there is much intrinsic uncertainty, because the information that decisionmakers have is unrepresentative, and because of cognitive biases.

Decisionmakers are likely to be well aware of liability experience at their own companies. However, they cannot obtain some other useful information, for example, numbers of claims and suits or settlement terms for products of other companies. Some information is publicly available from mass media, law journals, trade publications, writings and speeches by reform advocates, judicial decisions, and presentations at bar association meetings. However, published accounts, discussion within the business community, and policy advocacy seem to focus disproportionately on mass torts and individual cases with large damages, punitive damages, and arguably inappropriate outcomes.

Such accounts are likely to be very important in shaping perceptions of company decisionmakers because of the "availability heuristic" of the behavioral decisionmaking literature. As explained by Slovic, Fischhoff, and Lichtenstein:

People using this heuristic judge an event to be likely or frequent if instances of it are easy to imagine or recall. Because frequently occurring events are generally easier to imagine or recall than are rare events, availability is often an appropriate cue. However, availability is also affected by factors unrelated to frequency of occurrence. For example, a recent disaster or a vivid film could seriously bias risk judgments. n27

These authors review research indicating that personal experience is very important in affecting what can be imagined or recalled. n28 As discussed by Slovic, Fischhoff, and Lichtenstein, media accounts may also be very influential. n29

[\*250] These insights from the psychology literature suggest hypotheses about perception of liability risk. The perceived liability risk for a product should be substantial if a company has had extensive liability problems with it or a similar product. Such problems at other companies might also easily come to mind if decisionmakers have been exposed to extensive media coverage or other frequent or forceful information about them. Without such conditions, liability potential may not even attract the attention of decisionmakers.

The availability heuristic also suggests that when decisionmakers consider liability risk they often substantially overestimate it. Contributing to this are high-visibility liability episodes such as unusually large awards, punitive damages, and liability when injury causation is disputed by respected authorities. n30

An important implication of the likelihood that risks are overestimated is that absolute numbers or the relative frequency of punitive damages awards in product liability cases, or the frequency with which punitive awards are reduced or overturned, may tell us very little about the perceptions of company decisionmakers regarding the risk they face from punitive damages, i.e., the perceptions that drive their decisions. Given the considerable attention that punitive damages awards--and especially large or questionable awards--often receive, the threat of punitive damages may be greatly overestimated by company decisionmakers for reasons deeply rooted in human psychology. To dismiss misperception by company decisionmakers (as many do) as "their problem" n31 misses the key point: If misperception contributes to [\*251] manufacturer decisions and economic outcomes that are socially undesirable, that is also our (i.e., society's) problem.

In addition, the availability heuristic suggests that some liability risks may be underestimated because they are hard to imagine or recall. In the absence of well-known instances of large liability costs for a particular type of product, for example, liability potential may not even attract the attention of decisionmakers. Without such instances, large liability costs cannot be recalled, and hypothetical costs seem harder to imagine than actual ones. n32

In sum, to evaluate effects of current policies or predict effects of potential reforms, it is necessary to consider how--within a complex decision environment--various changes in liability policy would affect company perceptions of liability risk, perceived profit incentives and, in turn, company decisions. Let us now use this framework for thinking about company decisionmaking to consider various ways that attempts to influence manufacturer behavior with product liability and punitive damages may work out badly.

### III. Deterrence Pitfalls and Uncertain Standards of Behavior

Deterrence--discouraging or preventing dangerous behavior by product manufacturers--is often said to be a central goal of product liability. Deterrence is also a leading rationale for punitive damages. But not all deterrence is good. Product liability can discourage or dissuade manufacturers from taking socially desirable actions, for example, innovation efforts of some types and marketing of some socially valuable products. Such potential effects lie at the heart of widespread concerns about economic effects of product liability and punitive damages.

#### A. Claims About Desirable and Undesirable Deterrence

This special issue's concern with punitive damages is not limited to the product liability context; thus, I begin by

emphasizing that the kinds of deterrence failures discussed in this section are also not limited to that context. Table 1 summarizes claims about desirable and undesirable [\*252] deterrence effects in product liability and two other highly contentious areas: medical malpractice and liability for securities fraud. n33

[SEE TABLE IN ORIGINAL]

This part proposes a taxonomy of deterrence pitfalls and provides examples of claimed instances of them from the product liability debate and literature. I then consider a very controversial issue, the role of uncertainty in both good and bad*i.e.*, socially desirable and undesirable deterrence. I then argue that a particular type of uncertaintyCuncertainty about standards of behavior for avoiding product liability or punitive damagesCis likely to be particularly counterproductive with regard to the deterrence goals of the legal environment.

[\*253]

B. Underdeterrence, Overdeterrence, Misdeterrence and Absolute Deterrence

As discussed in Part II unless one cares only about safetyCthe social deterrence goal involves an optimal level of safety below the highest attainable level, and only some avenues for increasing safety are socially worthwhile. For simplicity of exposition, assume that in the absence of liability the level of product safety would fall short of its optimal level (*i.e.*, that market and regulatory incentives alone would not be sufficient to induce all socially worthwhile safety-enhancing actions). Then the deterrence goal of liability (including punitive damages) is to increase safety from the amount that would prevail in the absence of any liability up to the socially optimal level by inducing the right kinds of safety-enhancing actions.

The policy debate and various literatures suggest that product liability and punitive damages can fail to achieve this goal in four analytically distinct ways:

- . Underdeterrence: failing to induce all socially desirable increases in safety
  - . Overdeterrence: inducing excessive increases in safety
  - . Misdeterrence: inducing behavior that decreases safety
- . Absolute deterrence: inducing abandonment of socially worthwhile activities

The last three categories all involve deterrence of socially desirable behavior.

Underdeterrence exists whenever some aspects of behavior are less safe than is socially desirable. Claims that underdeterrence is a major failing of the current system are central to arguments that liability burdens are, if anything, too low. In support of this view, it is claimed that outrageously unsafe behavior is widespread; an often-invoked example is the Dalkon Shield intrauterine device.

Overdeterrence exists whenever behavior is safer in at least some dimensions than is socially desirable; *i.e.*, where some of the existing safety came at a social cost exceeding the associated social benefits. For those whose policy goal is maximum safety, overdeterrence is logically impossible because any increase in safety is by definition socially desirable. Overdeterrence is relevant for those who believe that benefits of additional safety should be weighed against its costs. Many claims of undesirable liability effects involve overdeterrence. Vaccines provide an [\*254] example where product liability deters adoption of socially desirable product designs. n34

Underdeterrence and overdeterrence involve liability inducing manufacturers to increase safety, but not in the right

ways or by the right amounts. Misdeterrence refers to inducing them to decrease safety. Perhaps the most important form of misdeterrence in product liability involves warnings, where product liability deters the use of socially desirable product labeling. In particular, the literature points to product liability as the reason that product manufacturers provide excessively extensive and detailed warnings, thus making it less likely that important warnings will be read, understood and heeded. n35 Claims of misdeterrence are raised in other areas of liability. n36 If such socially undesirable effects exist, they arise from features of the liability system generating perverse incentives: the legal safety of manufacturers increases (i.e., liability exposures fall) through actions that decrease the physical safety of those who might be injured.

The policy debate also includes many claims of absolute deterrence. For example, liability is claimed to cause manufacturers to withdraw socially valuable products from the market (e.g., some childhood vaccines, intrauterine devices, small aircraft), and "stifle" innovative efforts in some product areas. n37

Absolute deterrence would be widely viewed as regrettable--i.e., involve deterrence of socially desirable behavior--for many activities (e.g., vaccines, public playgrounds). Some would view absolute deterrence for other products or activities (e.g., firearms, tobacco, sky diving) as socially desirable. In any event, we can expect decisionmakers at profit-seeking companies to avoid an activity entirely if--under prevailing liability arrangements--doing so seems more conducive to their objectives than engaging in the activity at any feasible level of safety.

[\*255] In sum, product liability and punitive damages can change behavior in both socially desirable and socially undesirable ways. I refer to these possibilities simply as "good and bad deterrence."

#### C. Uncertainty Strengthens Both Good and Bad Deterrence

Since company decisionmakers are generally believed to perceive a cost to bearing additional uncertainty, increases in uncertainty about the consequences of particular actions--other things being equal--tend to discourage those actions. n38 People on both sides of the product liability policy debate argue that the unpredictability of liability outcomes and punitive damages have powerful effects on company behavior. They disagree vehemently, however, about the desirability of those effects.

Opponents of reducing liability exposure of manufacturers see unpredictability as essential to producing desirable behavioral responses and view reduction of uncertainty as a prescription for exacerbating underdeterrence, which they see as a major failing of the liability system. Proponents of reducing liability exposure of manufacturers see unpredictability as a leading cause of overdeterrence, misdeterrence and absolute deterrence--which they see as major failings of the system--and view reduction of uncertainty as a prescription for ameliorating socially undesirable deterrence.

Several sources of uncertainty were listed in Part II. Many of them--for example, those rooted in the unpredictability of human behavior--could not be eliminated without eliminating liability altogether. Assuming that such a change is out of the question, the policy issue is not whether product liability and punitive damages should involve uncertainty, but rather: What kinds of and how much uncertainty are more and less helpful or troublesome.

[\*256]

#### D. Uncertain Standards of Behavior Are Very Problematic

The main point of the remainder of this part is that a particular type of uncertainty appears to be generally counterproductive in achieving society's deterrence goals. Explaining this claim requires distinguishing between uncertainty about what behavior is required to avoid liability and uncertainty about the sizes of damage awards if one is held liable. The former is very problematic. n39

Predictable standards of behavior have considerable potential to deter in socially desirable ways. A decisionmaker engaging in an activity with the potential to cause numerous or severe injuries has--if potential liability costs are large enough--a strong incentive to avoid liability. n40 When, in addition, the decisionmaker knows what behavior will avoid liability, that person knows that behavior even a little less safe than this can involve large liability costs and thus that a small increase in safety will provide protection from large liability costs.

Thus, predictable standards of behavior hold out substantial hope for effective control of behavior because they could focus the attention of a decisionmaker on specific behaviors that are expected under the law and give that person substantial incentives to engage in them. Now consider why ineffective control of behavior is likely to result whenever there is substantial uncertainty about standards of behavior for avoiding liability and punitive damages.

With uncertain standards of behavior, companies cannot feel confident that they are shielded from liability costs resulting from socially desirable actions. When, in addition, there is a potential for very large direct and indirect liability costs (including punitive damages), even a small probability of such costs could be sufficient to deter those actions. This is because--as emphasized in the management literature--companies often will go to substantial lengths to avoid behavior that they view as very risky financially and to great lengths to avoid behavior that they [\*257] view as potentially disastrous. Moreover, uncertainty about standards may in some circumstances leave some socially undesirable actions undeterred. n41

Uncertainty about standards for assessing liability stems from several sources. In some cases it can be very unclear whether the injury was caused by the defendant, for example, whether a design feature of an automobile caused an accident or the use of a drug during pregnancy caused a birth defect. Determining whether--from a legal point of view--a product design is defective often requires comparing the risks and benefits with those of an alternative design. Judicial fact finders generally lack expertise about such issues and are often faced with conflicting opinions of expert witnesses hired by the litigants. n42

Much of the uncertainty about punitive damages results from vagueness in how legal doctrine specifies these standards. The types of behavior that warrant punitive damages are described in various states with terms such as "outrageous," "oppressive," and "malicious." n43 It is very hard for decisionmakers to predict with any confidence how such terms would be interpreted and applied in court.

#### IV. Deterrence Effects in Medical Products

The scope for socially desirable economic effects of product liability and punitive damages--and their actual effects--is expected to differ substantially across industries. Therefore, developing empirical information about economic effects of product liability and punitive damages requires industry-level analysis. The author has conducted a [\*258] study of prescription pharmaceuticals n44 and medical devices, or "medical products" for short. n45 This part presents an overview of that study and its conclusions. n46

The medical products industries are of substantial interest for two related reasons. First, products of these industries provide substantial benefits to consumers, and the industries are widely claimed to exhibit particularly troublesome economic effects of product liability. Second, claims about effects of product liability on the economy rely heavily on examples from these industries.

##### A. Determinants of Efficiency and Key Company Decisions

The economic efficiency of the drugs and devices industries can be thought of as the difference between the social benefits and social costs of developing, producing, and using medical products. Social benefits stem from improvements in the health and well-being of product users (patients). Social costs of drugs and devices are of two kinds. First, making drugs and devices available to patients requires productive resources (e.g., labor, materials, buildings, machines). Second, some patients suffer injuries (side effects). Social costs of these types are referred to as resource costs and

injury costs, respectively.

Drug and device companies confront several conflicts or tradeoffs between the safety of products and their effectiveness in promoting patient health or well-being. For example: (1) safety can be enhanced by additional product testing prior to marketing, but delaying product availability reduces benefits; (2) injuries can be averted for some patients by reducing drug dosage levels, but that can also reduce effectiveness for [\*259] many patients; and (3) injuries can be averted by more extensive product warnings, but such warnings can also discourage product use by patients who would be successfully treated. Such tradeoffs illustrate a general claim emphasized above: Maximizing safety is generally not efficient, because the social costs of many safety-enhancing measures are too high.

The four sets of economic outcomes highlighted in Figures 1 and 2 in the Appendix depend on numerous decisions of drug and device manufacturers. The most important of these decisions are summarized in Table 2.

[SEE TABLE IN ORIGINAL]

B. Analytic Approach and Information Used

To understand economic effects, it is necessary to predict how business decisions by medical products companies respond to the incentives created by product liability and punitive damages. The research strategy n47 was to use the most reliable, publicly available information to develop conceptual models of company decisions and to use the empirical information and models to make inferences. n48 The models were developed by synthesizing empirical information about the decisionmaking environments of companies and actual company decisions with literature in economics, psychology and management.

Conclusions were based entirely on publicly available information because--given the contentiousness of the policy issues--individuals with conflicting policy views will view other information as unreliable. Confidential, face-to-face interviews at three major pharmaceutical [\*260] companies and numerous, off-the-record discussions with other knowledgeable people were used to help identify issues, understand institutions, and locate information. However, information that is not in the public domain was not treated as data.

Three general types of empirical information were used: (1) information about the liability environment (e.g., court decisions, numbers of suits, sizes and factual bases of awards, legal briefs, commentaries, and analyses); (2) information about other aspects of the decision environment (e.g., market factors, analyses of effects of regulation, descriptions of the technology of drug development); and (3) information about company decisions (e.g., product introductions and withdrawals, product labeling, prices).

C. Potential for Very Large Direct Liability Costs

Although indirect costs are relevant, n49 the analysis of medical products focused on direct costs. This is because the histories of product liability in drugs and medical devices make potentially disastrous direct costs very salient to company decisionmakers. Factoring in (additional) indirect costs would merely strengthen the inferences based on direct costs.

Product liability costs can be very unpredictable at the time that decisions must be made, thus confronting decisionmakers with liability risk. The management literature suggests that business decisionmakers think about risk in terms of worst-case scenarios and will go to great [\*261] lengths to avoid potential financial disaster. The product liability histories of the medical products industries include episodes of multi-billion dollar direct liability costs and financial disasters. Two features of these histories are very salient to company decisionmakers in this regard: mass torts and punitive damages.

Potential mass torts threaten companies with financial disaster. Mass torts are very salient for medical products companies. For example, of the five products identified by Rheingold n50 as involving the largest numbers of product

liability claims, two involved drugs (Bendectin and DES, with roughly 2000 claims each) and one a medical device (the Dalkon Shield, with more than 200,000 claims and more than \$ 2.2 billion allocated to a compensation fund in the bankruptcy reorganization of its producer). n51

More recently, settlement agreements have been reached in tens of thousands of claims involving the Shiley heart valve. n52 A tentative settlement had been reached involving about 65,000 breast implant claims and compensation payments of more than \$ 3.5 billion over several years. n53 This settlement is being renegotiated. Finally, in September 1997--in the wake of the withdrawal of the diet drugs Redux and Pondimin from the market amid concerns about damage to heart valves n54 --it appeared likely that mass litigation would emerge involving these products, with some predicting that the payouts could ultimately exceed those in the breast-implant litigation. n55

Moreover, punitive damages have been awarded n56 and--perhaps [\*262] more important, have received enormous amounts of attention--in suits involving medical products. Controversies about punitive damages and other aspects of product liability litigation in these industries appear to play a fundamental role in shaping the perceptions of company decisionmakers and, thereby, in affecting decisions that determine the economic efficiency of the industries.

#### D. Controversies Fuel Perceptions About Liability Risk

When attempting to understand the perceptions of decisionmakers, the availability heuristic of the behavioral psychology literature directs our attention to events that are easy to imagine or recall. Widely known controversies--and the passion and attention they generate--tend to make company decisionmakers overestimate the prevalence and future likelihood of events like those fueling the controversies.

Major controversies involving punitive damages in medical products cases are not hard to find. Punitive damages can be awarded only when liability is found, and some controversial punitive awards involve cases in which many view the appropriateness of liability as dubious. These include situations involving considerable doubt about injury causation, n57 and situations in which the behavior in question was required by the FDA, n58 or was otherwise responsive to government policy. n59 Several [\*263] controversies about causation of injuries of drug and device users have also become very widely known. n60 These controversies fuel perceptions by company decisionmakers that they can be held liable for injuries not caused by their products.

#### E. Products That Dominated Perceptions a Few Years Ago Provide Insights About Perception Formation

Many of the most visible and costly product liability episodes in pharmaceuticals and medical devices involve vaccines, n61 contraceptives, n62 and products for conditions specific to pregnancy. n63 In fact, during the late 1980s and early 1990s much of what was written about liability in drugs and devices by knowledgeable observers suggests that these were the product types with major liability potential. n64 But even by the early 1990s other types of products had experienced major and widely known liability problems.

Analysis of the liability histories of vaccines, contraceptives, and products for pregnant women provides insight concerning the types of events that can have major effects on perceptions. This issue is [\*264] fundamental for predicting the effects of policy reforms on company decisions because--according to the conceptual framework--liability reform can affect economic outcomes in the industries only if it changes the perceptions of decisionmakers about their incentives stemming from the liability system.

What explains the extreme prominence of vaccines, contraceptives, and products for pregnant women in many characterizations of the liability environment in drugs and medical devices during the late 1980s and early 1990s? If at the time of these characterizations there were factors common to the three product areas and largely unique to them, this would provide substantial evidence that some or all of the factors are particularly influential in shaping perceptions.

In fact, four such commonalities are apparent. In particular, liability histories in all three product areas involve each

of the following kinds of events which had been unique or largely limited to these product areas:

.Liability is believed to have driven from the U.S. market products with substantial support in the medical community.  
n65

.Product withdrawals were accompanied by company announcements pointing to liability. n66

.Product-availability crises were associated with liability. n67

.Plaintiff victories became causes celebre of tort-reform advocates, often because of controversies concerning injury causation or punitive damages awards. n68

In addition, while large punitive damages awards were not limited to vaccines, contraceptives and products for pregnant women, products in all three categories have involved such awards. n69

In sum, it appears that perceptions of liability risk of company decisionmakers--and many outside observers as well--are fueled by [\*265] especially prominent, publicly known events. The key contributors to prominence appear to be concern about undesirable deterrence and controversial trial outcomes.

#### F. Economic Effects of Liability in These Industries

Here I report highlights of the conclusions drawn about effects on company decisions and implications for economic efficiency. The reasoning is often intricate, involving special features of the decisionmaking environment. n70

##### 1. product availability

How does product liability affect the availability of existing products to U.S. patients? What are the implications for economic efficiency? The conclusions point to a mixture of good and bad deterrence effects.

Liability appears to have caused companies to withdraw from the market some products with widespread support in the medical community (e.g., some childhood vaccines, some IUDs, and Bendectin). There is little doubt that at least some of these withdrawals were undesirable from the standpoint of economic efficiency.

[\*266] Other product withdrawals have been widely attributed to liability. These include products with injury costs that appear to exceed product benefits (e.g., the Dalkon Shield). There is more controversy about the medical value of other products whose withdrawals are often attributed to liability (e.g., the Shiley heart valve, silicone-gel breast implants). Market forces and regulatory action may well have driven many of these products off the market even without liability, but liability probably at least hastened these withdrawals. Hastening withdrawal of products whose safety costs outweigh their effectiveness benefits improves economic efficiency.

##### 2. product prices

Some major price increases seem clearly attributable to liability (e.g., some childhood vaccines and Bendectin). n71 For most products, however, price effects of liability are likely to be nonexistent or small, because many products do not pose substantial liability threats, and pricing in the drugs and devices industries is often a very inexact process.

##### 3. product safety and effectiveness

Safety and effectiveness of drugs and devices depend on product design characteristics and the information made available to physicians, patients and the FDA. Consider these in turn.

Liability, technological, and regulatory conditions differ across drugs, vaccines, and devices, and liability appears to have quite different effects on the designs or physical characteristics of these different product types.

Liability-induced changes in the chemical structure of drugs--if any have occurred--are likely to be the exception, not the rule. Use of live-virus vaccines may have been deterred by liability, and if so this is likely to be inefficient because live-virus vaccines are generally sufficiently more effective than killed-virus vaccines to justify the extra safety risks. In contrast, liability may have induced safer designs for many devices, and many increases in device safety could be efficient, especially for devices that were not subjected to extensive FDA review before U.S. marketing.

Apparent effects operating through creation and dissemination of information are also a mixed bag of good and bad deterrence. Liability encourages manufacturers to provide physicians with lengthy, descriptive (rather than interpretive) and detailed warnings about numerous possible safety hazards, but discourages manufacturers from warning patients directly or providing any safety information designed for them. n72 Some argue that physicians are immune from information overload (e.g., are [\*267] willing and able to read, properly interpret and act upon massive amounts of detailed information) and that patients should get their information from physicians. These views are controversial, however, and some liability effects on information to physicians and patients are likely to have inefficient consequences. On the other hand, liability fortifies already strong, but not universally effective, incentives for companies to comply with FDA regulations. Liability may, for example, deter some companies from ignoring safety problems or concealing them from the FDA; if so, this strengthens deterrence of behavior that is likely to be inefficient.

#### 4. innovation

Some types of products may be viewed as so legally hazardous that companies would not even consider developing them. The most plausible example is products for conditions specific to pregnancy because the legal hazards of such products are very salient to decisionmakers. Additional mass torts for such products n73 seem plausible because birth defects are not uncommon and many have unidentifiable causes; this leaves companies vulnerable to numerous lawsuits. There is no indication that companies are attempting to develop products specifically for pregnant women, even though such products might have health benefits exceeding their social costs.

For most products, however, factors besides liability enter R'D decisions. In these cases liability is unlikely to deter efforts to develop products believed to have exceptionally large profit potential--so-called "blockbusters"--because such profit potential would usually be sufficient to induce companies to accept large liability risks. But liability is likely to deter development efforts for socially valuable products whose profit potential is viewed as more limited (e.g., some contraceptives and vaccines).

#### G. Availability of Materials for Implantable Medical Devices

After the completion of my 1993 RAND Institute for Civil Justice Study, n74 cogent concerns emerged about another potential form of bad deterrence. Industrial materials (usually, chemical) companies have become unwilling or extremely hesitant to supply developers and manufacturers of implantable medical devices with "biomaterials" used [\*268] in development and manufacture of these products. n75 While empirical evidence--beyond the publicized refusal of some companies to supply materials--is sketchy, the claims raised in this area stand up to economic logic and the economic consequences could be profound.

Materials used in implantable devices are usually n76 The quantities that can be sold to device manufacturers are insignificant in comparison, and the associated revenues are of almost no consequence to large industrial companies. In the profit calculus of materials companies, then, the perceived potential of costly lawsuits--even if all would be defended successfully n77 --could easily outweigh any upside potential of supplying to implantable device manufacturers. This illustrates a fact that is often overlooked in the liability debate: Costs of winning lawsuits can be considerable and these costs are just as relevant to companies' bottom lines as the same number of dollars of direct and indirect costs incurred in settling or losing lawsuits.

Because the economic logic of this concern is so clear, and because materials companies are well aware of the issue, to my mind the difficult question is not whether this issue should be taken seriously. Rather, it is what could be done to avoid the potential economic consequences. With so little profit potential, it doesn't take much in the way of potential liability costs--even "just" the costs of winning summary judgments in several lawsuits--for materials companies to believe that it is not in their interest to supply materials for use in implantable medical devices. n78

[\*269]

#### H. Economic Effects in Medical Products: Summary

The prevailing liability system in some ways enhances and in some ways undermines the economic efficiency of the drugs and devices industries. The primary beneficial effects appear to be hastening withdrawal of products that are too hazardous for economic efficiency, deterring the withholding or distorting of reports to the FDA, and generating information useful to physicians and the FDA. The primary detrimental effects appear to be limiting the availability of socially valuable products, inefficiently distorting the mix of innovative investments, and encouraging companies to provide hard to interpret information to physicians and no information to patients. The biomaterial availability issue looms large for future availability and innovation of implantable medical devices.

Such effects illustrate the four categories of deterrence pitfalls introduced in Part III. While liability appears to have succeeded in hastening the withdrawal of inefficiently hazardous products and deterring the withholding or distorting of information to the FDA, it should not be presumed that liability has done this job completely. Undeterred instances of hazardous, inefficient behavior would exemplify underdeterrence. Withdrawal of socially valuable products involves absolute deterrence. To the extent that liability has led to warnings to physicians and patients that undermine safety, misdeterrence has resulted. Deterrence of innovative efforts that would have resulted in socially valuable products (i.e., deterrence of efficient innovation activities) could exemplify overdeterrence or absolute deterrence depending on the circumstances.

Underlying various socially detrimental deterrence effects is the perception of decisionmakers that in some circumstances they face very large liability risks for engaging in socially desirable activities. Perception of large liability risks for socially desirable behavior appears to be grounded in instances where liability is found--and sometimes punitive damages are assessed--based on what company decisionmakers view as worthless or inadequate scientific evidence of injury causation or [\*270] for behavior required or encouraged by government policy. Lack of predictable standards of behavior--to avoid liability and punitive damages--leaves us in a situation where decisionmakers cannot dismiss the possibility of disastrous liability consequences even if their behavior is socially desirable. This is a blueprint for bad deterrence.

#### V. Automobiles and the Role of Indirect Liability Costs

The conclusions described for medical products stem from various combinations of elements of the market, technological, regulatory, and legal environments in those industries. Many of these elements are not present in U.S. industry at large. A case in point is automobiles.

The Institute for Civil Justice is following up the 1993 study of medical products with one of the automobile industry. This industry was chosen because it is characterized by very prominent episodes of product liability and punitive damages as well as concerns about detrimental economic effects, and it offers good prospects for developing useful data.

##### A. Lack of Inter-Product Differences and Subtle Effects on Decisions

As difficult as it is to draw inferences about economic effects in medical products, drawing inferences for automobiles seems even more difficult.

First, unlike medical products, effects of product liability on company decisions seem not to differ markedly across individual vehicle models n79 or vehicle classes. n80 Although liability experience differs greatly across particular models and vehicle classes, this appears not to have been the case with perceived liability exposure at the time that design, manufacturing and warnings decisions were made. As a result, research on economic effects in the automobile industry cannot rely on differences in company behavior across products to make inferences about decisionmaking and liability effects on decisions.

Second, and perhaps largely because ex ante perceived liability exposure does not vary dramatically across products, effects on company behavior appear to be more subtle than with some medical products. For example, dramatic effects on product availability--such as discontinuation of vehicle classes or models with no close substitutes or price increases concentrated on particular models--have not been claimed.

In automobiles, claimed effects of the legal environment on company decisions--more specifically, day-to-day engineering practice--are [\*271] plausible, but rather subtle, and none can be observed directly by company outsiders. n81 This does not imply, however, that such effects would be economically insignificant. It does imply they would be very difficult to prove or quantify.

#### B. Potential Economic Effects in Automobiles

Automobile companies have considerable incentives to pursue safety coming from both the market and its safety regulator (the NHTSA). To understand how product liability and punitive damages affect company decisions, we need to consider these other incentives.

Automobile companies have market-based incentives to enhance the safety of their products in whatever ways are important to, and discernible by, their potential customers. Consumers can directly observe or verify the presence of some safety features such as seat belts, padded dashboards and air bags. Information about other safety-related vehicle attributes, such as braking distances and handling in (simulated) emergency situations, is available from automotive and consumer publications. In addition, the NHTSA conducts crash tests of vehicles and publicizes the results. Some safety-related attributes of particular vehicles, however, may be very costly or effectively impossible for consumers to evaluate. Regulation by the NHTSA--promulgation and enforcement of motor vehicle design standards and the threat of safety-related recalls--provides additional strong incentives for product safety.

The scope for product liability to enhance automobile safety in efficient ways depends on how closely safety would approximate its efficient level in the absence of liability, i.e., because of market and regulatory incentives alone. Reasonable people disagree about this difficult, yet fundamental, question. Nonetheless, consideration of effects of product liability and punitive damages should not--as is often the case--ignore the existence of these other incentives. n82

Product liability has raised major concerns about effects on product design and innovation among engineers in several U.S. industries, including automobiles. A recent conference volume published by the National Academy of Engineering n83 addresses the general issue and [\*272] contains two papers--by industry insiders--discussing effects of product liability on engineering practice in the automobile industry. These accounts also provide insight into the nature of perceived product liability risk within the industry.

Castaing n84 argues plausibly--but, necessarily, without direct evidence--that product liability has three distinct types of socially detrimental effects on automotive engineering practice: (1) hesitance to pursue revolutionary or radical innovation (because radically different designs are hard to defend in court); (2) disincentives for engineers to engage in "honest and critical evaluation of the features on current and past vehicles" (for fear that internal company communications will become damaging legal evidence when taken out of context); and (3) hesitance to improve vehicle designs quickly for fear that changes will be alleged--and believed--to be evidence of defects in the earlier designs. n85

Babcock n86 emphasizes large punitive damages awards in discussing financial risks to companies from product liability. Another legal risk factor is "negative predictions written by the manufacturer's own engineers during the design process." n87 For tangible evidence of effects on innovation of broader product liability exposure in the United States than in other countries, he looks to differences between the United States and other countries in availability of products and automotive safety features. On the former, he cites the existence of "small commuter or city cars" in Europe and Japan, stating that these are not available in the United States "in large part because of product liability considerations." n88 On the latter, he reports that anti-lock braking systems--developed in the United States--were available overseas before the United States, suggests this may have been due to product liability concerns, but also ascribes little importance to the delay.

[\*273] Taken together, the Castaing and Babcock discussions reinforce the point that no matter how large or important, the key economic effects of product liability and punitive damages in automobiles are likely to be beyond direct empirical study. Analysis of effects requires making inferences based on an understanding of company incentives and corporate decisionmaking in the face of risk. The work in progress involves econometric analysis of automobile company incentives to avoid product liability and punitive damages with an emphasis on indirect costs of liability.

#### C. Worst-Case Scenarios for Automobile Company Decisionmakers

Not only does it appear that the economic effects of product liability differ greatly between the medical products and automobile industries, the keys to understanding company incentives also seem likely to differ. Specifically, case studies and less systematic information indicate that potential indirect costs of liability may be fundamental to worst-case company scenarios in automobiles.

The history of product liability in the automobile industry suggests that direct liability costs of financially disastrous proportions are not as salient to company decisionmakers as they are in medical products. Mass torts anywhere near the scale of those experienced in medical products (and some other industries) have not occurred in automobiles. n89 Large punitive damages awards, however, are not hard to find. n90

While direct liability costs are by no means trivial in the industry, available evidence suggests that indirect liability costs--fueled by mass media coverage--are likely to be a prominent element in the worst-case company scenarios for assessing liability risks. Moreover, it appears that [\*274] punitive damages can play a prominent role in triggering these indirect costs.

Histories of various car or truck models involve some or all of the following elements relevant to indirect costs of litigation. Once safety concerns about a vehicle model arise, whether well-founded or not, a complex, interdependent chain of events may be set off which includes: personal injury litigation; controversy over engineering evidence and injury causation; mass media attention, often triggered by large trial awards which often include punitive components; pressure on the NHTSA by groups representing consumers, victims, plaintiffs or plaintiffs' attorneys; recall investigations by the NHTSA and eventual recall of the vehicles; and declining sales of the model. Vehicles with case histories containing many, if not all, of these elements--including punitive damages--are the Ford Pinto, Jeep --J-5 and --J-7, n91 the Audi 5000, n92 and, more recently, the GM C/K (side-saddle) pickup trucks. n93

#### D. Ongoing Analyses of Indirect Liability Costs

Such case histories provide motivation and guidance for our ongoing analyses of the automobile industry. While case histories are provocative and suggestive, they typically focus on unusual sets of circumstances and leave many questions unanswered. Even if the causal interpretations suggested by their authors are valid, what more general lessons, if any, do the cases illustrate? How often do large or punitive product liability verdicts trigger media attention and regulatory or market responses? Under what circumstances?

Addressing such questions requires observation and systematic comparison of relatively large numbers of cases.

Our work uses publicly available, quantitative information about dozens of product liability cases and vehicles and econometric analysis to examine these kinds of questions. n94 Such information should be revealing about the nature and size of incentives of automobile companies to avoid product liability episodes in general and punitive damages awards in particular.

[\*275] The study involves econometric investigation, with special attention to punitive damages, of: (1) determinants of mass media coverage of product liability verdicts; (2) effects of product liability verdicts--and media coverage--on company stock prices; and (3) effects of product liability verdicts--and media coverage--on sales of vehicles involved in verdicts. n95 Here I discuss the determinants of mass media coverage.

#### E. Mass Media Coverage of Verdicts and Punitive Awards

Results from the analysis of determinants of newspaper and television news program coverage were presented at the conference from which this special issue derives. n96 The analysis of newspaper coverage is described more completely in a separate article. n97 Here I provide an overview of the analysis and results pertaining to punitive damages.

The goals of the analysis are to gauge the extent and clarify the determinants of mass media coverage of verdicts in personal injury, product liability cases brought against automobile manufacturers. A sample of such cases was developed by searching a specialized litigation reporter and jury verdict reporters for the years 1985 to 1996. n98 This search yielded 351 trial verdicts reached during the years 1983 to 1996 n99 meeting our criteria for analysis. n100 Of these, 92 verdicts (all but one rendered by a jury) involved awards of money damages ("plaintiff [\*276] victories") and 259 did not ("defendant victories"). n101 Of the 92 plaintiff victories, 16 included an award of punitive damages. n102

##### 1. newspaper coverage

For each verdict, we searched on-line, full-text databases for newspaper articles covering them. The number of newspapers we could search for each verdict depends on the date of the verdict. n103 We searched for and collected articles reporting the verdicts n104 using the name of the defendant company, the make of vehicle, and the surname of [\*277] the plaintiff as keywords n105 within the 15-day period centered on the date the verdict was announced. n106

We expected that newspaper coverage of plaintiff victories would be considerably more prevalent than coverage of defendant victories, but were surprised by the degree of the difference we found. In particular, we found an article in at least one newspaper (among those we could search given the year of the verdict) for: (1) only 9 of the 259 defendant victories; n107 (2) 38 of the 92 plaintiff victories; and (3) 10 of the 16 plaintiff victories involving punitive awards. n108

Since we found almost no defendant verdicts with any newspaper coverage, we then focused on the question: Among the plaintiff victories, what determines the extent of newspaper coverage? With the aid of journalism literature, we developed hypotheses--and corresponding empirical counterparts and measures--about determinants of newspaper coverage to guide an econometric analysis. Because interest here centers on the magnitudes of damages and punitive damages, n109 other [\*278] independent variables included in the analysis are regarded here as "control variables" n110 and are not discussed further.

The unit of observation for the econometric analysis is a verdict-newspaper pair. The number of sample observations corresponding to each verdict is the number of newspapers that could be searched given the date of that verdict. There are a total of 3680 sample observations of which 731 involve verdicts with a punitive award. The outcomes measures analyzed econometrically include (1) a dichotomous variable indicating whether or not we found an article in a particular paper about a particular verdict; n111 and (2) the number of words a particular paper published about a particular verdict. n112

Figure 3 in the Appendix summarizes results highlighting the role of punitive damages in the incidence of newspaper reporting of verdicts against automobile manufacturers. Measured vertically in the figure are predicted values from the analysis of the dichotomous outcome, which can be interpreted as the probability n113 --according to the model and estimates--that a randomly chosen newspaper publishes an article about a particular verdict. n114 Measured on the horizontal axis is the total damages assessed--compensatory plus punitive--in initial trial award, n115 adjusted for inflation and expressed in millions of 1995 dollars.

[\*279] The lower curve in the figure plots the probability of newspaper coverage as function of total damages when there is no punitive award. n116 The higher curve plots the probability of newspaper coverage as a function of total damages when there is a punitive award.

Not too surprisingly, each curve individually indicates that newspaper coverage is more probable the higher are the total damages involved. n117 Perhaps more surprising is the implication of the relationship between the two curves: holding total damages constant, if part of the award is punitive, the verdict is much more likely n118 to trigger an article in a newspaper chosen at random. n119

The size of the estimated effect of punitive damages is quite large. As can be seen from Figure 3 in the Appendix, an award of roughly \$ 2 million that includes a punitive component is as likely to receive newspaper coverage as a \$ 25 million award that is entirely compensatory. Holding total damages constant, the figure indicates that the probability of a newspaper article is 3.5 to 5.5 times higher if a component of the damages is punitive. n120

The estimates indicate that a punitive award tends to increase newspaper coverage for two distinct reasons. First, there is a consequent increase--sometimes very substantial--in total damages, which moves us along the horizontal axis. Second, there is an independent contribution because of the punitive nature of the verdict, which moves us to the higher curve. n121 Consider a numerical example. Imagine a verdict with ten million dollars in compensatory damages. If it involves no punitive [\*280] damages, then point A in Figure 3 in the Appendix is relevant, and the probability of a newspaper article in a randomly chosen paper is about .02. Now suppose there is also a punitive award of ten million dollars. Total damages of \$ 20 million--if they were entirely compensatory--would direct our attention to point B, corresponding to a probability of about .03, which is only a little higher. But because we are assuming that part of the award is punitive, point -- in Figure 3 is relevant, indicating a probability of about .13.

## 2. television coverage

We used information from three different sources to examine television coverage triggered by verdicts. n122 This analysis is more tentative--and qualitative--because the available information is much more limited. For example, for verdicts before 1992, the only news programs that can be analyzed are the half-hour evening news reports on CBS, NBC and ABC, which can be searched for the entire sample period. n123 With the exception of these three programs, we cannot be confident about the completeness of coverage of individual shows for programs that are covered by the databases even for 1992 to 1996. n124 Moreover, we could not search full-text ourselves in any of the three [\*281] databases. n125 Thus the discussion below should be viewed as suggestive rather than definitive.

We found very few relevant items. The major exceptions were several stories triggered by the Moseley verdict, which involved \$ 4.2 million in compensatory and \$ 101 million in punitive damages in a 1993 GM C/K pickup truck case. This verdict triggered eight television reports that we could locate, three of which were on CNN. The only other verdicts--in our sample or otherwise--on which we found television reports were the two other verdicts in our sample with the next highest nominal levels of punitive damages (\$ 100 million and \$ 58 million), with a single story each. n126

## 3. coverage when awards are lowered

For 26 of the 92 plaintiff verdicts in our sample, we learned from the Automotive Litigation Reporter that the original

award was subsequently overturned or lowered by the trial judge or by an appeals court. n127 This provided a limited opportunity to examine whether and to what extent such post-trial events do--as many believe--attract less media coverage than the original awards. Table 3 summarizes the characteristics of the 26 cases and the results of comparing the amounts of newspaper coverage about the original awards and subsequent events that reduced (and in many cases, eliminated) them.

[\*282]

[SEE TABLE IN ORIGINAL]

As indicated in the table, of our 16 punitive awards, we learned that 7 were lowered or entirely overturned. We also learned that compensatory awards were lowered in 19 other cases. We compared the amount of newspaper coverage, measured three ways: numbers of articles, numbers of words, and numbers of articles on the first page of any section.

First consider the comparative amounts of newspaper coverage for the 7 punitive verdicts. Of the 6 that received some newspaper coverage, the original award received more newspaper coverage in terms of articles, words and front page articles. But for all three measures, there were a few cases for which the reduction of the award received more newspaper coverage.

Next consider the 19 cases where a compensatory award was reduced (but not a punitive award). Among the 10 cases that received any newspaper coverage, more articles about the original award were found (containing more words in total) in 6 of them, but the opposite was true in the other 4 cases.

[\*283] Because the sample sizes are so small, n128 these results are merely suggestive. What they suggest is that the conventional wisdom that initial awards receive more media coverage than subsequent reductions or elimination of them--is correct, but to a much more limited degree than much rhetoric suggests and many would have predicted.

#### 4. mass media coverage: summary

Mass media coverage of product liability verdicts can be costly to companies for tangible and intangible reasons. Newspaper and television coverage is rare in cases where manufacturers are not found liable. Verdicts against defendant automobile manufacturers, however, generate substantial amounts of mass media coverage, particularly in newspapers. Newspaper coverage is more likely if total damages are larger--and is much more likely if part of the award is punitive. Verdicts appear to trigger very little television coverage, and virtually all of the television coverage we found was triggered by verdicts that included unusually large punitive damages awards.

These results, in combination with the availability heuristic, suggest that company decisionmakers are likely to substantially overestimate the frequency and magnitudes of punitive damages awards in automobile product liability cases. Attorneys at automobile companies may monitor verdicts around the country and have relatively good information about the incidence of punitive damages, but they are not immune from inaccurate processing--deeply rooted in human psychology--of such information. Perhaps more important, automotive engineers, the decisionmakers whose behavior is central to concerns about economic effects discussed above, are likely to rely much more heavily on mass media reports and overestimate the incidence of punitive damages to a greater extent.

Since decisions are driven by the perceptions of decisionmakers, punitive damages may have much more powerful effects on manufacturer behavior than would be suggested by systematic evidence about the frequency and size of punitive awards, and the frequency with which they are reduced or overturned. A factor contributing to misperceptions is likely to be relatively little media attention to post-verdict reduction or elimination of awards. However, the available evidence suggests that differences in the extent of reporting between initial verdicts and subsequent reductions are less pronounced than commentators have suggested.

[\*284] Media coverage can be costly to companies--and give them additional incentives to avoid liability and

punitive damages awards--whether or not the coverage triggers other costly events. Our ongoing work uses econometric methods to examine tangible potential indirect costs of verdicts--and media coverage of them--such as reductions in vehicle sales and company stock prices.

## VI. Lessons and Implications for Improving the Reform Debate

What general lessons emerge from the theorizing in Parts II and III, the conclusions from empirical study of medical products summarized in Part IV, and the information about the automobile industry reported in Part V? How do these lessons accord with what one would infer from the policy debate about product liability and punitive damages? What guidance do these lessons provide for nudging that debate in directions that could better serve the national interest?

### A. Key Lessons from the Previous Discussion

The analyses above suggest seven simple, yet powerful, lessons about the economic effects of punitive damages in product liability cases:

- (1) Many of the most important potential effects of punitive damages on business decisions and economic outcomes cannot be observed or measured.
- (2) Costs of punitive damages to companies may go far beyond expenditures to defend lawsuits and pay awards and include, for example, negative publicity and effects on product sales.
- (3) Company decisionmakers--whose perceptions determine effects on company decisions--are likely substantially to overestimate the frequency and magnitude of punitive damages.
- (4) The effects of punitive damages on business behavior and economic outcomes cannot be reliably analyzed in isolation from other incentives affecting business decisions such as market and regulatory forces.
- (5) The potential for punitive damages to improve economic outcomes and the actual economic effects of [\*285] punitive damages can--and almost certainly do--differ greatly across industries, and across products within some industries.
- (6) Punitive damages can--and almost certainly do--have important economic effects, some of them socially desirable and others socially undesirable.
- (7) A crucial factor determining the relative amounts of socially desirable and undesirable deterrence is the degree to which business decisionmakers can confidently predict whether their behavior will or will not lead to punitive damages.

Moreover, these lessons apply to product liability costs generally, not just punitive damages. Let me elaborate on the bases and implications of these lessons.

Punitive damages operate within the product liability system and tend to magnify both the good and bad deterrence effects of that system. Potential punitive damages can weigh very heavily in the perceived incentives of company decisionmakers because punitive damages are unlimited in size in individual cases and may be assessed--and their availability may increase settlement amounts--in multiple cases. The mainstream view of corporate risk assessment and risk management from the management literature suggests that large risks can weigh heavily in the thinking of company decisionmakers and have major effects on decisions.

Conclusions of my 1993 RAND Institute for Civil Justice study n129 reviewed in Part IV indicate that product

liability has both good and bad economic effects in the medical products industries, that punitive damages play an integral role, and that the economic stakes for society can be very high. The discussion in Part V suggests a number of conclusions. First, the economic effects of product liability in the automobile industry are likely to be more subtle but potentially important economically. Second, potential punitive damages may play an integral part by posing risks of very large direct liability costs and of triggering or propelling a complex set of dynamics that includes adverse publicity and costly market and regulatory reactions. In sum, from this "Tale of Two Industries" emerges the lesson that punitive damages can be--simultaneously--both the best and worst of deterrents. Reforms should aim at increasing good deterrence and reducing bad deterrence.

[\*286] In theory, punitive damages in product liability are designed to punish and deter especially hazardous or egregious behavior by product manufacturers. The analysis suggests that many company decisions bearing on product safety may be sensitive to liability only if companies perceive a potential for major liability costs. Such potential costs are not, however, completely and credibly limited to inefficient behavior. n130 As a result, company decisionmakers believe--with some justification--that they can be subjected to liability costs and punitive damages even if they engage only in socially desirable behavior.

It may be impossible for product liability and punitive damages strongly to deter undesirable behavior without also deterring desirable behavior to a major degree. Any liability policy--including the status quo--confronts this fundamental dilemma.

#### B. The Policy Debate Is off the Mark and Narrows Our Options

The policy debate starkly juxtaposes two views of the economic effects of product liability and punitive damages. On one side are organized representatives of business interests who propose reforms that will reduce liability burdens, and on the other side are organized representatives of consumer and plaintiff interests, who oppose such reforms. n131 Proponents of reform claim that the economic effects of liability are predominantly bad--in short, that we have "too much liability." n132 Opponents of reform claim that the key effects of liability are improvements in product safety and that hazardous products remain a serious concern--in short, that we have "too little liability."

Characterizing the issue this way pushes policy makers to choose one view or the other. Neither view gives guidance on how to increase or decrease liability. More fundamentally, there may be some truth in both views. n133

[\*287]

#### C. Punitive Damages and Predictability of Behavioral Standards

As argued above, a fundamental requirement for good deterrence is reasonably predictable standards of behavior. The best hope for achieving socially desirable economic outcomes through liability policy is to establish socially desirable standards and to convince company decisionmakers that conforming with standards will protect them from liability, while failing to meet such standards will entail very substantial costs. n134

When it comes to standards for punitive damages, the best hope for increasing predictability appears to be revising legal doctrine. Reasonable, intelligent people disagree about whether specific acts are, or are not, accurately described by words such as "outrageous," "oppressive," or "malicious." For example, some people might think that it is "outrageous" to ignore hints or ambiguous evidence of a safety hazard; others might not. Some people might think it "malicious" to consider production costs (and product price) in deciding whether to make a product safer; again, others might not. n135 If decisionmakers don't feel confident that they know how such words will be interpreted in the future, standards for punitive damages are not predictable to them. Such a situation might be ameliorated by changing doctrine to specify rather than describe acts that do and do not warrant punitive damages.

#### D. Reforms Targeted at Particular Industries Could Help A Lot

The economic effects of product liability and punitive damages and the scope for and routes to improvement are likely to differ greatly across industries. These differences stem from industry differences with respect to liability doctrine, administrative regulation, consumer risk information, market structure, and costs of product safety improvement. This suggests that reforms targeted at particular industries--or even products--warrant consideration. n136

[\*288] It also appears that legislative reforms targeted at particular industries can be politically viable at the federal level, albeit perhaps only if a sense of crisis develops. Federal product liability legislation enacted to date has been aimed at remedying product availability crises in childhood vaccines and small aircraft. The next crisis of this sort could involve implantable medical devices affected by difficulties of device manufacturers in obtaining biomaterials. It is likely to be instructive to watch this drama unfold. It is also likely to be distressing because averting very large public health costs may require changes in product liability doctrine and procedure that go well beyond what other social concerns and the politics of tort reform will permit.

#### E. Improving the Debate Must Confront Its Politics

The quality and outcome of the debate can benefit from a recognition that political realities drive the agenda to simple, but misleading, characterizations of both problems and solutions. Although many participants in the debate care intensely about product liability and punitive damages, most citizens don't know or care much about them. So dramatic, simple claims are used to attract popular attention and support. Two caricatures are especially prominent: irresponsible juries awarding excessive amounts in damages, and irresponsible manufacturers callously endangering public safety. Neither is nearly as common as some would have us believe. Surely, neither is a promising substantive foundation for effective, far-reaching reforms.

##### 1. the distribution issue

I have focused on effects of product liability and punitive damages on economic efficiency. Information about economic effects often gets deflected in the policy debate, however, by appeals to fairness. Many claims about fairness pertain to distribution between consumers and manufacturers or between plaintiffs and defendants on the other. Much of the political discussion about fairness is misguided.

First, reforms that benefit business may also benefit consumers. Contrary to the rhetoric, the issue is not simply a choice between business interests and consumer interests. For example, consumers benefit from product availability and innovation. Moreover, higher costs due to business responses to product liability and punitive damages often translate into higher prices. Finally, consumers also participate in business as employers, employees and stockholders. Economic efficiency is not a zero-sum game.

Second, reforms that improve economic effects do not necessarily reduce fairness of compensation. In addition to deterrence, we look to [\*289] the product liability system to compensate people fairly for product injuries. Yet principles of compensation are rarely discussed in the debate, perhaps because we know we'll never approach consensus on what is fair. There is good reason to be skeptical of an implicit assumption that distorts the debate: namely, that economically beneficial reforms would necessarily reduce fairness of compensation. More compensation is not necessarily fairer compensation. Moreover, some economically beneficial reforms would involve increases in compensation.

##### 2. political burdens of proof

The status quo is politically privileged in most policy contexts. In the context of federal product liability legislation, the usual forces protecting the status quo are strongly reinforced by the fact that product liability traditionally has been the province of the states. Many policymakers and commentators have argued that federal action would be warranted only in the presence of compelling evidence of major, detrimental effects on interstate commerce.

However, it could be impossible to meet this standard of proof no matter how detrimental the effects actually are because many potential effects cannot be seen or measured. Such effects include discouraging innovation (a favorite claim of reform advocates) and deterring dangerous corporate behavior (a favorite claim of those defending the status quo). The policy process does not benefit from demanding compelling evidence of effects we can't see or measure.

### 3. coupling increases and decreases in liability exposure

This strategy deserves serious attention. With most onlookers believing that product liability is a zero-sum game between businesses and consumers or that improving economic effects must reduce fairness, reform packages that can be portrayed as primarily benefitting business are very vulnerable politically. Legislative reforms could be more politically viable if they included elements that clearly increase liability in some ways and clearly decrease it in others.

A well-chosen combination of elements that strengthen the deterrence of bad behavior and weaken the deterrence of good behavior might attract broad support and be very beneficial economically. One possibility along these lines would be to clarify standards for the availability of punitive damages--currently based on vague terms like "outrageous" and "reckless"--in order better to guide companies and juries alike. Another example would be to change the legal procedures for dealing with scientific evidence of injury causation so as to increase companies' fears that they will be held liable for injuries caused by their products while [\*290] decreasing their fears that they will be held liable for injuries not caused by their products.

The reform debate often emphasizes how manufacturers are disadvantaged by vague standards for awarding punitive damages and difficulties in dealing with scientific evidence. Less appreciated is the fact that plaintiffs are often disadvantaged by these same features of the current system. Well-designed reforms aimed at these issues could cut both ways, advantaging plaintiffs in some instances and defendants in others.

### 4. imperfection is inevitable, lack of progress is not

In less contentious contexts, we all recognize that the fact that someone else's suggestion is imperfect does not mean it is inferior to the available alternatives. All achievable product liability systems will leave plenty to be desired because different people want the product liability system to accomplish very different things, any one of which would be impossible to achieve with precision. The current system is badly flawed. The research reviewed here suggests that the product liability system is haphazard as a deterrence mechanism. There is also good reason to think that it is a costly n137 and haphazard n138 compensation mechanism. It is unlikely that anyone would design anything like it if either economic performance or fair compensation were the goal. Indeed, it is unlikely [\*291] that anyone would design anything like it if the goal were an explicit compromise.

In political forums we often have great difficulty admitting the obvious--much less calmly discussing complicated, difficult issues. When considering potential reforms, the goal should be improvement, not perfection. Many arguments for and against particular reforms do little more than point out--often inaccurately--imperfections with someone else's proposal. We could all benefit by admitting that achieving anything close to perfection is impossible and moving on from there.

[SEE APPENDIX IN ORIGINAL]

#### **Legal Topics:**

For related research and practice materials, see the following legal topics:

Torts  
Damages  
Punitive Damages  
Award Calculations  
Appellate & Posttrial Review  
Civil Procedure  
Remedies  
Damages  
Punitive Damages  
Torts  
Damages  
Punitive Damages  
Conduct Supporting Awards

#### **FOOTNOTES:**

n1. Steven Garber, Institute for Civil Justice (RAND), Product Liability and the Economics of Pharmaceuticals and Medical Devices (1993) (R-4285-ICJ).

n2. The claim that members of society are often willing to sacrifice safety for other things is bolstered by observation of private risk-taking behavior. For example, people voluntarily accept extra risk when they drive cars to save time or take dangerous jobs to earn higher wages.

n3. Garber, *supra* note 1.

n4. The Product Liability Fairness Act: Hearings on S.687 Before the Subcomm. on Consumer of the Comm. on Commerce, Science, and Transp., 103d Cong. 120 (1993) [hereinafter S.687 Hearings] (statement of Pamela Gilbert, Director of Public Citizen's Congress Watch).

n5. This is despite the suggestions that safety is outside the scope of economics and that consumer protection must be at odds with economic efficiency.

n6. Much of the liability policy rhetoric emphasizes effects on international trade outcomes and, thereby, national economic "competitiveness." But most economists, including the author, believe that such a narrow policy focus is inappropriate. International competitiveness is worth pursuing only to the extent that this improves U.S. standards of living, a goal that is indistinguishable from economic efficiency. A recent discussion of dangers of competitiveness as a policy goal, Paul Krugman, *Competitiveness: A Dangerous Obsession*, Foreign Aff., Mar.-Apr. 1994, at 28, and responses, *The Fight over Competitiveness*, Foreign Aff., July-Aug. 1994, at 186, suggest that there is now little disagreement among key participants in the debate that high and rising standards of living are the fundamental economic goal.

n7. If members of society--who are, after all, consumers as well as producers--do indeed care about more than safety, as claimed, it is interesting to consider why some consumer advocates focus exclusively on safety. There are several possibilities. For example, consumer advocates may believe some or all of the following: (1) safety should matter more to people than it does; (2) people don't understand the safety implications of their behavior, so that private behavior is not truly indicative of values; (3) the social costs of increasing safety will not be borne by consumers; or (4) staking out the position that safety should be maximized is a useful tactic in a political struggle to increase safety.

n8. In the jargon of economists, this occurs when the marginal social benefit of increasing safety just equals the marginal social cost.

n9. See Robert G. Schloerb et al., *Punitive Damages: A Guide to the Insurability of Punitive Damages in the United States and Its Territories* 54-55 tbl.H (1988).

n10. For example, the FDA must approve the marketing of prescription drugs and relatively hazardous medical devices before they can be sold in the United States, and all drugs and many devices require substantial clinical evidence of product safety (and effectiveness) before such approval is granted. Marketing of motor

vehicles does not require prior approval, but the NHTSA promulgates design standards for motor vehicles, can assess fines for failure to comply and can compel product recalls to remedy deviations from safety standards or other safety hazards.

n11. In addition to effects on company incentives and decisions emphasized in this Article, media reporting of liability events can be very important because of effects on claiming behavior and on the views of the public concerning the civil justice system. Bailis and MacCoun report on a content analysis of 118 articles in five national news and business news magazines from 1980 to 1990, focusing on the extent to which these accurately represent the world of tort litigation. See Daniel S. Bailis & Robert J. MacCoun, *Estimating Liability Risks with the Media as Your Guide*, 20 *Law & Hum. Behav.* 419 (1996).

n12. Media reporting of liability events, such as verdicts, can also play an important role by attracting attention and spurring action by additional potential claimants. Media reports can also be very influential in determining how company decisionmakers perceive their incentives to avoid liability and punitive damages. See *infra* Part II.E.

n13. My 1993 RAND study discusses apparent instances of demand effects stemming from liability activity in the drug and devices industries. See Garber, *supra* note 1. Graham discusses such possibilities in the context of motor vehicles. See John D. Graham, *Product Liability and Motor Vehicle Safety*, in *The Liability Maze* 120 (Peter W. Huber & Robert E. Litan eds., 1991) [hereinafter *Liability Maze*]. As emphasized by Fisse and Braithwaite, adverse publicity can also involve detrimental non-financial consequences for companies, such as: decreases in corporate image, prestige of senior managers, and employee morale; and distraction of key management personnel. Potential non-financial consequences can also affect company decisions. See Brent Fisse & John Braithwaite, *The Impact of Publicity on Corporate Offenders* 232-33 (1983).

n14. Curcio proposes to increase the pain of companies subjected to punitive damages awards by publicizing the awards. See Andrea A. Curcio, *Painful Publicity--An Alternative Punitive Damage Sanction*, 45 *DePaul L. Rev.* 341 (1996). However, she does not consider potential detrimental economic effects of publicity.

n15. As emphasized by Klein and Leffler, consumers use brand names as an assurance of quality, and undermining confidence in the quality of products of a particular brand can decrease demand for all products of that brand. See Benjamin Klein & Keith B. Leffler, *The Role of Market Forces in Assuring Contractual Performance*, 89 *J. Pol. Econ.* 615 (1981). In fact, at a September 1993 symposium sponsored by the National Academy of Engineering (NAE)--see *Product Liability and Innovation* (Janet R. Hunziker & Trevor O. Jones eds., 1994) [hereinafter *Product Liability*]--an attorney representing an automobile company reported from the audience that almost every product liability claim involves a claim for punitive damages and that the potential effect on the company's reputation and sales can be a more important concern to the company than the dollar value of settlements or court awards.

n16. For example, the time from the commencement of clinical trials for a drug to the peak of its sales cycle is roughly twenty years. Automobile models take at least a few years to design and move into production, are then marketed for several years, and then remain on the road for roughly a decade after initial purchase.

n17. Economists do not typically use the term "risk" this way, however.

n18. The term "risk" is variously used in different literatures to denote the probability of loss, the size of the potential loss, or some combination such as the expected value of the loss.

n19. James G. March & Zur Shapira, Managerial Perspectives on Risk and Risk Taking, 33 Mgmt. Sci. 1404, 1407 (1987).

n20. Zur Shapira, Risk in Managerial Decision Making (1986) (unpublished manuscript on file with Hebrew University).

n21. March & Shapira, *supra* note 19, at 1407.

n22. *Id.* at 1410.

n23. *Id.* at 1412.

n24. See *id.* at 1410.

n25. Companies are more likely to take a particular risk, other things being equal, if doing so seems necessary to achieve an important goal:

In general, if one is above a performance target, the primary focus is on avoiding actions that might place one below it...

For decision makers who are, or expect to be, below the performance target, the desire to reach the target focuses attention in a way that leads generally to risk taking.

*Id.* at 1413.

n26. While changing designs, providing warnings, or withdrawing products from the market are obvious ways to mitigate liability risk, there are many others. See Garber, *supra* note 1, at 97-100 (discussing those used in the cases of several medical products whose profit potential apparently justifies bearing substantial liability risk).

n27. Paul Slovic et al., Behavioral Decision Theory Perspectives on Protective Behavior, in *Taking Care: Understanding and Encouraging Self-Protective Behavior* 14, 19 (Neil D. Weinstein ed., 1987).

n28. See *id.* at 20.

n29. See Paul Slovic et al., Facts Versus Fears: Understanding Perceived Risk, in *Judgment Under Uncertainty: Heuristics and Biases* 463, 467-68 (Daniel Kahneman et al. eds., 1982).

n30. See 2 American Law Institute, Reporters' Study, Enterprise Responsibility for Personal Injury: Approaches to Legal and Institutional Change 235 (1991) (referring to "the somewhat distorted perception one gets from reading about only the largest and most questionable punitive awards"); Michael Rustad, Demystifying Punitive Damages in Products Liability Cases: A Survey of a Quarter Century of Trial Verdicts (1991) (arguing that misconceptions about punitive damages are widespread); W. Kip Viscusi, Reforming Products Liability 1 (1991) ("Seemingly outrageous cases have come to epitomize the malfunctioning of the tort liability system."); Joe S. Cecil et al., Citizen Comprehension of Difficult Issues: Lessons from Civil Jury Trials, 40 Am. U. L. Rev. 727, 743 (1991) ("Often repeated 'horror stories' about jury verdicts, many of which are unconfirmed or erroneous, encourage a misleading impression of the performance of the civil jury.") (footnote omitted); Stephen Daniels & Joanne Martin, Myth and Reality in Punitive Damages 75 Minn. L. Rev. 1 (1990) (arguing, also, that misconceptions about punitive damages are widespread).

n31. See Michael D. Green, Statutory Compliance and Tort Liability: Examining the Strongest Case, 30 U. Mich. J.L. Reform 461, 510 (1997) ("Enacting reform statutes that reflect those distorted perceptions may provide additional succor for [manufacturers].").

n32. Evidence consistent with this view is reported by McGuire--much higher fractions of corporate CEOs reported taking the following actions in response to "actual liability experience" relative to "anticipated liability problems": discontinuing product lines (36 percent versus 11 percent, respectively); not introducing new products (30 percent versus 9 percent); and discontinuing product research (21 percent versus 4 percent). See E. Patrick McGuire, The Impact of Product Liability 19 tbls.28-29 (Conference Board Research Report No. 908, 1988).

n33. For overviews and empirical analyses of the economics of product and medical malpractice liability, see Liability Maze, *supra* note 13; Patricia M. Danzon, Liability for Medical Malpractice, *J. Econ. Persp.*, Summer 1991, at 51; W. Kip Viscusi & Joni Hersch, The Market Response to Product Safety Litigation, 2 *J. Reg. Econ.* 215 (1990). For policy issues related to securities litigation, see Ross Kerber, Shareholder Suits Prompt Reform Push, *Wash. Post*, Aug. 8, 1993, at H1; Shareholder Suits: Class Acts, *Economist*, Mar. 19-25, 1994, at 95.

n34. Product liability appears to push companies away from developing and marketing vaccines containing live (weakened) viruses, in favor of vaccines using killed ones, even though live-virus vaccines are generally more effective and viewed by health professionals as well worth their extra risks. See Garber, *supra* note 1, at 129-30.

n35. See Viscusi, *supra* note 30; James A. Henderson, Jr. & Aaron D. Twerski, Doctrinal Collapse in Products Liability: The Empty Shell of Failure to Warn, 65 N.Y.U. L. Rev. 265 (1990).

n36. Examples include the possibility of injuries to patients if physicians engage in inappropriate diagnosis and treatment motivated by protection from malpractice claims; and that publicly held companies refrain from offering quantitative financial projections, thus limiting information that could aid the functioning of capital markets and help investors avoid financial injury.

n37. Liability leading a municipality to close a playground would also be an instance of absolute deterrence.

n38. Scholarly analyses of aspects of this broad issue in the context of legal uncertainty include John E. Calfee & Richard Craswell, Some Effects of Uncertainty on Compliance with Legal Standards, 70 *Va. L. Rev.* 965 (1984); Isaac Ehrlich & Richard A. Posner, An Economic Analysis of Legal Rulemaking, 3 *J. Legal Stud.* 257 (1974); E. Donald Elliot, Why Punitive Damages Don't Deter Corporate Misconduct Effectively, 40 *Ala. L. Rev.* 1053 (1989); Jason S. Johnston, Bayesian Fact-Finding and Efficiency: Toward an Economic Theory of Liability Under Uncertainty, 61 *S. Cal. L. Rev.* 137 (1988); Louis Kaplow, Optimal Deterrence, Uninformed Individuals, and Acquiring Information About Whether Acts Are Subject to Sanctions, 6 *J.L. Econ. & Org.* 93 (1990).

n39. If--as is not the case--decisionmakers could confidently predict what behavior would avoid liability and punitive damages, and if these standards of behavior were well-chosen (e.g., they corresponded to economically efficient behavior), then uncertainty about the magnitude of damages would not be a concern from a deterrence point of view. The extra impetus to conform with the legal standards provided by uncertainty about the size of awards would merely increase the likelihood of (in this case) socially desirable compliance with the standards. This line of reasoning is based on the key ideas in the economic theory of negligence. See Robert Cooter & Thomas Ulen, Law and Economics 326-71 (1988); Steven Shavell, Economic Analysis of Accident Law 5-46 (1987); Robert D. Cooter, Economic Theories of Legal Liability, *J. Econ. Persp.*, Summer 1991, at 11.

n40. See Cooter & Ulen, *supra* note 39, at 326-71; Shavell, *supra* note 39, at 5-46; Cooter, *supra* note 39.

n41. In the product liability context, unpredictability is often claimed to be socially desirable based on arguments such as "if liability is predictable, then manufacturers will merely pass along liability costs to consumers [and not increase safety]." For example, "Without this threat, and the uncertainty of its financial costs, manufacturers could treat compensation for death and injury caused by their products as just another cost of doing business." S.687 Hearings, *supra* note 4, at 84 (statement of Pamela Gilbert, Director of Public Citizen's Congress Watch). This argument has some influence, so it deserves attention. First, it doesn't stand up to the most basic economic logic. For example, we expect companies to respond to predictable increases in wages by attempting to reduce labor use. We should similarly expect companies to respond to predictable costs of injuries by attempting to increase safety in ways (and to the extent) that serve the profit objective. Second, the claim would be irrelevant to the line of argument in the text even if it were plausible. With predictable liability standards but uncertainty about damages, liability costs would be predictable only if the decisionmaker complied with the standards (i.e., liability did succeed in deterring).

n42. See Samuel R. Gross, Expert Evidence, 1991 *Wis. L. Rev.* 1113.

n43. See 2 American Law Institute, *supra* note 30, at 244.

n44. Throughout, "pharmaceuticals" and "drugs" include biological products such as vaccines.

n45. Garber, *supra* note 1.

n46. For studies of lawsuit filings against pharmaceutical companies in federal courts, see Terence Dungworth, Institute for Civil Justice (RAND), Product Liability and the Business Sector: Litigation Trends in Federal Courts (1988) (R-3668-ICJ); W. Kip Viscusi et al., A Statistical Profile of Pharmaceutical Industry Liability, 1976-1989, 24 *Seton Hall L. Rev.* 1418 (1994). For discussions of product liability law in

pharmaceuticals and medical devices, see Garber, *supra* note 1, at 37-45; Jeffrey N. Gibbs & Bruce F. Mackler, Food and Drug Administration Regulation and Products Liability: Strong Sword, Weak Shield, 22 *Tort & Ins. L.J.* 194 (1987); James A. Henderson, Jr. & Aaron D. Twerski, A Proposed Revision of Section 402A of the *Restatement (Second) of Torts*, 77 Cornell L. Rev. 1512, 1537-46 (1992); Sheila R. Shulman & Marianne E. Ulcickas, Update on ADR Reporting Regulations: Products Liability Implications, 3 J. Clinical Res. & Drug Dev. 91 (1989); Judith P. Swazey, Prescription Drug Safety and Product Liability, in *Liability Maze*, *supra* note 13, at 291.

n47. See Garber, *supra* note 1.

n48. Many of the outcomes of interest are unobservable and inference is required.

n49. Information uncovered or publicized in the course of a lawsuit--for example, allegations of safety hazards or failure to comply with FDA regulations--can lead to costly actions by the FDA--examples are Bendectin (see, e.g., Louis Lasagna, The Chilling Effect of Product Liability on New Drug Development, in *Liability Maze*, *supra* note 13, at 334, 340; Joseph Sanders, The Bendectin Litigation: A Case Study in the Life Cycle of Mass Torts, 43 *Hastings L.J.* 301, 318-19 (1992)) and silicone-gel breast implants (see, e.g., Jean Seligmann, A Vote of No Confidence, *Newsweek*, Mar. 2, 1992, at 75; Tim Smart, This Man Sounded the Silicone Alarm--In 1976, *Bus. Wk.*, Jan. 27, 1992, at 34)--or decreases in demand for a product--for example, Prozac (see, e.g., LeRoy Hersh, Firm's Defense Plan Looks Like Slick Marketing Ploy, *Legal Times*, Sept. 2, 1991, at 25; Charles F. Preuss, Company to Doctors: Don't Be Intimidated by Smear Campaign, *Legal Times*, Sept. 2, 1991, at 25), Bendectin (see, e.g., Dow Chemical Stops Making Nausea Drug for Pregnant Women, *Wall St. J.*, June 10, 1983, at 12), silicone-gel breast implants (see, e.g., Jean Seligmann, Another Tempest in a -- Cup, *Newsweek*, Mar. 23, 1992, at 67) and vaccines (see, e.g., Office of Technology Assessment, A Review of Selected Federal Vaccine and Immunization Policies 3 (1979)). Viscusi and Hersch estimate effects of liability suit filings on the stock prices of drug companies; such effects should reflect investors' predictions of previously unanticipated, uninsured direct costs plus indirect costs of these filings. See Viscusi & Hersch, *supra* note 33.

n50. ABA Comm'n on Mass Torts, Report to the House of Delegates, app. E, at 1e (1989) (separate statement of Paul D. Rheingold).

n51. See Milo Geyelin & Amy Dockser Marcus, Dalkon Shield Victims Get Details of Procedure for Compensation, *Wall St. J.*, Mar. 19, 1990, at B8.

n52. See Milo Geyelin, Pfizer Accord on Heart Valve Wins Approval, *Wall St. J.*, Aug. 20, 1992, at B3.

n53. See Gina Kolata, Details of Implant Settlement Announced by Federal Judge, *N.Y. Times*, Apr. 5, 1994, at A16; Nearly 15,000 Opt out of Global Settlement, *Pharmaceutical Litig. Rep.*, Sept. 1994, at 9655.

n54. See Laura Johannes & Steve Stecklow, Dieting Dilemma: Withdrawal of Redux Spotlights Predicament FDA Faces on Obesity, *Wall St. J.*, Sept. 16, 1997, at A1.

n55. See Laura Johannes & Richard B. Schmitt, Lawyers Prepare for Deluge of Diet-Drug Suits, *Wall St. J.*,

Sept. 17, 1997, at B1.

n56. A search by the Pharmaceutical Manufacturers Association (PMA) and the American Medical Association (AMA) yielded counts of six punitive damages trial awards in drug cases from 1970 to 1979, seventeen from 1980 to 1984, and 35 from 1985 to 1988. See Brief of the Pharmaceutical Manufacturers Association and the American Medical Association, as Amici Curiae in Support of Petitioner at 12 n.29, *Pacific Mut. Life Ins. Co. v. Haslip*, 499 U.S. 1 (1991) (No. 89-1279) [hereinafter PMA/AMA Brief]. Rustad located 53 trial awards of punitive damages between January 1965 and August 1990 in product liability cases involving "medical products." See Rustad, *supra* note 30, at 26 tbl.

n57. One example is punitive damages assessed against Bendectin. See PMA/AMA Brief, *supra* note 56, at 20-22; Rustad, *supra* note 30, at 9, 31; Bruce N. Kuhlik, & Richard F. Kingham, The Adverse Effects of Standardless Punitive Damage Awards on Pharmaceutical Development and Availability, 45 *Food Drug Cosm. L.J.* 693, 702-03 (1990).

n58. This interpretation is widespread for *Wooderson v. Ortho Pharmaceutical Corp.*, 681 P.2d 1038 (Kan. 1984), which involved an oral contraceptive. See Richard M. Cooper, Drug Labeling and Products Liability: The Role of the Food and Drug Administration, 41 *Food Drug Cosm. L.J.* 233, 234 (1986); Charles J. Walsh & Marc S. Klein, The Conflicting Objectives of Federal and State Tort Law Drug Regulation, 41 *Food Drug Cosm. L.J.* 171, 186 (1986).

n59. Punitive damages were awarded in *Johnson v. American Cyanamid Co.*, No. 81 C. 2470 (18th Jud. Dist., Sedgewick County, Kan., June 1984) by a jury that found the Sabin live polio vaccine preferred by the U.S. Centers for Disease Control defective because the alternative Salk killed-virus vaccine was safer. See Institute of Medicine, Vaccine Supply and Innovation 115 (1985); Darren R. Hensley, Polio Vaccine Warnings--A Crippling Blow to Individual Autonomy, 11 *J. Prod. Liab.* 39 (1988); Edmund W. Kitch, Vaccines and Product Liability: A Case of Contagious Litigation, 9 Regulation, May-June 1985, at 11, 15. The verdict was overturned on appeal, but this case still appears to be important in shaping perceptions. For example, the PMA and the AMA refer to Johnson as "an illustrative case," without discussing a similar one. PMA/AMA Brief, *supra* note 56, at 17-18.

n60. A cause celebre among tort-reform advocates is *Wells v. Ortho Pharmaceutical Corp.*, 615 F. Supp. 262 (N.D. Ga. 1985), aff'd in part, modified in part and remanded by 788 F.2d 741 (11th Cir. 1986)--a case involving a spermicide and a birth defect--which to many observers exemplifies the possibility of major financial liabilities based on findings of causation in the absence of scientific evidence. See Luigi Mastroianni, Jr. et al., Developing New Contraceptives 134 (1990); Gross, *supra* note 42. Also very prominent is whether Bendectin--a drug for the morning sickness accompanying pregnancy--causes birth defects. See Michael D. Green, Bendectin and Birth Defects: The Challenges of Mass Toxic Substances Litigation (1996); Lasagna, *supra* note 49, at 337-41; Sanders, *supra* note 49, at 331-48. Two very prominent cases involving the Sabin oral polio vaccine have also involved disputes over injury causation. See Institute of Medicine, *supra* note 59, at 88-89; John K. Iglehart, Compensating Children with Vaccine-Related Injuries, 316 *New Eng. J. Med.* 1283 (1987); Kitch, *supra* note 59, at 15. Another example is the swine flu vaccine, see Institute of Medicine, *supra* note 59, at 93-114. A very prominent, more recent controversy involves injury causation and silicone-gel breast implants.

n61. Examples include swine flu, DTP (diphtheria, tetanus, pertussis) and other childhood vaccines.

n62. Examples include several IUDs, oral contraceptives, and a spermicide.

n63. Examples include DES and Bendectin, which were prescribed to prevent miscarriage and for morning sickness, respectively.

n64. See, e.g., Office of Technology Assessment, Pharmaceutical R&D: Costs, Risks and Rewards 169-82 (1993); Viscusi, *supra* note 30, at 66; Ross H. Weaver, AMA Board of Trustees, Impact of Product Liability on the Development of New Medical Technologies (1988); W. Kip Viscusi, Product and Occupational Liability, *J. Econ. Persp.*, Summer 1991, at 71, 88.

n65. The three types of products are the three examples cited by the AMA. See Weaver, *supra* note 64.

n66. Examples include Wyeth's DTP vaccine, the Copper-7 IUD, and Bendectin.

n67. Examples include DTP, IUDs, and Bendectin.

n68. In addition to examples discussed, see *supra* Part IV.D, DES involves highly controversial legal decisions involving liability for latent injuries and proportionate or market-share liability. See, e.g., *Sindell v. Abbott Lab.*, 607 P.2d 924 (*Cal.* 1980).

n69. Examples include Bendectin, an oral contraceptive, an oral polio vaccine, and the Copper-7 and Dalkon Shield IUDs.

n70. See Garber, *supra* note 1, at 77-167.

n71. For econometric analyses of product liability and drug prices, see Richard L. Manning, Changing Rules in Tort Law and the Market for Childhood Vaccines, *J.L. Econ.*, Apr. 1994, at 247; Richard L. Manning, Products Liability and Prescription Drug Prices in Canada and the United States, *J.L. Econ.*, Apr. 1997, at 203.

n72. A key reason for this is a feature of product liability law for medical products that does not apply to other products. This is the "learned intermediary rule" which requires that warnings be given to physicians (the learned intermediaries between the manufacturers and patients). Manufacturers can be held liable for failure to warn physicians; hence the extensive information directed at physicians. With a few exceptions, however, manufacturers have no duty to warn patients directly, but they can be held liable for defective warnings to patients--hence the paucity of warnings directed at patients.

n73. Both DES--used to prevent miscarriage--and Bendectin--a treatment for morning sickness--generated mass torts.

n74. Garber, *supra* note 1.

n75. See, e.g., Materials Supplier Liability and the Coming Crisis in Availability of Life-Saving Medical

Devices: Hearing Before the Subcomm. on Regulation and Gov't Info. of the Senate Comm. on Governmental Affairs, 103d Cong. (1994); Paul Citron, Medical Devices, Component Materials, and Product Liability, in *Product Liability*, supra note 15, at 54; Barnaby J. Feder, *Implant Industry Is Facing Cutback by Top Suppliers*, N.Y. Times, Apr. 25, 1994, at A4.

n76. These materials generally are not designed or tested by materials companies for use in contact with human tissue.

n77. An often-cited example is DuPont successfully--but hardly costlessly--defending hundreds of liability suits resulting from use of one of their materials (Teflon) in the Vitek jaw implant. See, e.g., *Product Liability and Legal Reform: Hearing Before the House Comm. on the Judiciary on H.R.10*, 104th Cong. 76 (1995) (statement of Peter A. Chevalier, Vice President, Corporate Quality and Regulatory Affairs, Medtronic, Inc.) ("DuPont incurred tens of millions of dollars of legal costs defending itself ... [and] has been found not liable in 258 of 259 cases thus far. The cost of winning is simply too high."). The Vitek implant failed and caused numerous, serious injuries; litigation forced the manufacturer into bankruptcy. See Bruce Ingersoll & Rose Gutfeld, *Medical Mess: Implants in Jaw Joint Fail, Leaving Patients in Pain and Disfigured*, Wall St. J., Aug. 31, 1993, at A1.

n78. Title II of the Common Sense Product Liability Legal Reform Act vetoed by the President in May 1996, focused on the biomaterials issue. See H.R. Conf. Rep. No. 104-481 (1996). The bill specified that materials suppliers could be liable for injuries associated with an implanted device only if they manufactured or sold the device, or if the material sold did not meet contractual specifications. It attempted to reduce the costs to materials suppliers of defending suits in which they would eventually prevail by limiting discovery prior to--and setting out procedures to expedite--rulings on motions for summary judgments. It is not evident, however, that such measures would be sufficient to induce materials manufacturers to continue or resume supplying developers or manufacturers of implantable devices because the profit contributions of such transactions are very limited, and it is far from clear that the perceived liability risk would be essentially eliminated.

n79. Examples include Ford Taurus, Plymouth Voyager and Toyota Corolla.

n80. Examples include subcompacts, sports cars and pickup trucks.

n81. Direct resource or transaction costs of dealing with product liability in the automobile industry are not generally emphasized. This may be because on a per-car basis they aren't very large, or because companies choose not to reveal this information for other reasons.

n82. For example, the less scope one sees for improvement by even a perfectly functioning product liability system, the less one should be willing to risk in the way of bad deterrence to attempt to improve matters with a real-world product liability system.

n83. *Product Liability*, supra note 15.

n84. See Francois J. Castaing, *The Effects of Product Liability on Automotive Engineering Practice*, in *Product Liability*, supra note 15, at 77, 78-79. At the time of publication of the NAE volume, Castaing was vice

president for vehicle engineering at Chrysler.

n85. An automobile company attorney has told me on a confidential basis that this is a common concern among engineers at his company even though legal doctrine in most states forbids product improvements from being used as evidence of previous defects. He also reported that he faces a continual struggle within his company to get engineers to stop worrying about this possibility. This anecdote illustrates the general point emphasized above that it is perceptions of legal risk--accurate or not--that determine behavior.

n86. See Charles W. Babcock, Jr., *Approaches to Product Liability Risk in the U.S. Automotive Industry*, in *Product Liability*, supra note 15, at 82, 88-89. At the time of publication of the NAE volume, Babcock was an attorney on the legal staff of General Motors.

n87. Id. at 91.

n88. Id. at 92.

n89. I am unaware of any systematic analysis of why this is the case. An apparent element is the role of long-term latency of injuries in medical products: many people can be irrevocably exposed to harm before injuries become apparent. With automobiles, injuries become apparent as crashes (or other traumatic events) occur, and, moreover, if an automobile poses a safety hazard it can be recalled and fixed.

n90. A particularly large--and well-known--award is a 1978 jury award of \$ 125 million in punitive damages in a Pinto case (reduced to \$ 3.5 million by the trial judge). See, e.g., Marc Galanter & David Luban, *Poetic Justice: Punitive Damages and Legal Pluralism*, 42 *Am. U. L. Rev.* 1393 (1993); Graham, supra note 13, at 132-33. The sample described below includes 16 other punitive damages awards (of 92 cases involving any award) from 1986 to 1996 that average about \$ 30 million in 1995 dollars (about \$ 28 million in nominal terms). The medians are \$ 16 million in 1995 dollars and slightly more than \$ 13 million, respectively. Of 355 punitive awards in personal injury product liability cases between January 1965 and August 1990, 260 did not involve asbestos, and of those 53 involved "vehicles"--"exploding tires, automobiles, mobile homes, airplanes, trucks, boats." Rustad, supra note 30, at 26.

n91. See, e.g., Graham, supra note 13.

n92. See, e.g., Peter W. Huber, *Galileo's Revenge: Junk Science in the Courtroom* 57-74 (1991); Warren Brown, *Consumers Steer Clear of the Audi 5000 S; Sales Plummet on Safety Allegations*, Wash. Post, Dec. 28, 1986, at K1.

n93. See, e.g., Sam LaManna, *GM Verdict Could Affect Future Cases*, Nat'l L.J., May 3, 1993, at 21; Daniel Pearl & Douglas Lavin, *U.S. Decision on Recall of GM Trucks Is Delayed as Agency Sees No Precedent*, Wall St. J., June 6, 1994, at A4; Rich Thomas, *Just as Safe at Any Speed*, Newsweek, May 10, 1993, at 52.

n94. I am aware of no other such studies for any industry.

n95. Companion work investigates the effects of automobile recalls--and media coverage of them--on stock prices and vehicle sales. The feasibility of systematic work on the effects of liability events on NHTSA behavior remains to be determined. It may not be possible to investigate empirically for automobiles how, how often, and to what extent publicity about liability events and safety concerns fuels personal-injury litigation.

n96. Steven Garber, *Punitive Damages and Business Decision Making: A Tale of Two Industries*, slide presentation to National Conference on the Future of Punitive Damages, Institute for Legal Studies, University of Wisconsin, October 1996.

n97. Steven Garber & Anthony G. Bower, *An Econometric Analysis of Newspaper Coverage of Product-Liability Verdicts* (Feb. 1998) (unpublished manuscript on file with authors).

n98. Most of the cases in the sample were identified using the *Automotive Litigation Reporter* (ALR), Andrews Publications, Wayne, Pennsylvania.

n99. Some articles published after 1984 in the ALR reported post-trial events (e.g., appeals court rulings) for verdicts in 1983 and 1984, and these verdicts were included in the sample if they met our other criteria. We did not include any verdicts before 1983 because (see *infra*) almost no information about media coverage could be developed for such years.

n100. The date of the verdict had to be available from a litigation or jury verdict reporter or from some other means besides mass media reports. Thirteen trial dates were obtained by writing or calling attorneys listed in the litigation reporter. In addition, other characteristics of the case (e.g., the model of vehicle involved) had to be known to permit subsequent analysis.

n101. All of the defendant victories in the sample were found in the ALR. Because of a relatively small number of plaintiff victories, we searched California and New York jury verdict reporters for additional verdicts. Thirteen additional plaintiff victories in California were identified from *Jury Verdicts Weekly*. Search of *The New York Jury Verdict Reporter* did not yield any additional sample observations.

n102. There is considerable sample variation in the size of the punitive awards. The (nominal) amounts of the punitive awards ranged from \$ 15,000--two others were \$ 100,000 or less--to \$ 101 million--five others were \$ 25 million or more. Several of these were later reduced or eliminated by the trial judge or on appeal. See *infra* Part V.E.3.

n103. The *Wall Street Journal* and the *New York Times* were searched in their respective databases. (The former is not available on-line before 1984.) The DIALOG PAPERS database group of Knight-Ridder Information, Inc. was used to search several other newspapers from around the country. It includes more papers for later dates. The number of papers that can be searched grows rapidly during our sample period. For example, only 5 newspapers could be searched in DIALOG for 1983, 11 for 1986, 24 for 1988, 40 for 1989, 55 for 1990, and a high of 57 for 1994.

n104. Specifically, we counted as relevant only those articles that were "triggered" by the verdict, i.e., for which the verdict is the reason (or justification) for publishing the story. This distinction is relevant for only a

single case in the sample, but it is highly relevant for that one: the Moseley verdict involving a GM C/K side-saddle pickup truck and an award of \$ 101 million in punitive damages, see, e.g., Peter Applebome, G.M. Is Held Liable over Fuel Tanks in Pickup Trucks, N.Y. Times, Feb. 5, 1993, at A2. This verdict triggered the largest number of articles in our sample. Within the time period after the verdict covered by our search, GM sued NBC for a news magazine (NBC Dateline) story involving the C/K pickup trucks; this generated many more articles--triggered by the GM-NBC conflict, not the verdict--that also mentioned the Moseley verdict. These latter articles are not included in the analysis.

n105. Hypothetical search strings are: (1) (Chrysler or Plymouth) and Jones; (2) (General Motors or GM or Chevrolet) and Smith; and (3) (Ford or Mercury) and Thompson. This procedure was developed by experimentation aimed at capturing virtually all relevant articles without also capturing enormous numbers of irrelevant ones (which are costly to examine and discard). We experimented with search strings not containing the plaintiff's name but containing instead other keywords such as "liability" (which located several financial articles), "trial" (which located several reports on automobile road tests) and "verdicts" (which located various articles about trial outcomes other than product liability), but located very few relevant articles in addition to those located using the search procedure we adopted.

n106. We searched earlier than the verdict date to investigate pre-verdict coverage of trials. It turned out, however, that pre-verdict newspaper coverage was too rare for our sample to support systematic analysis of the phenomenon: only one of the ninety-two plaintiff victories had pre-verdict coverage in more than one newspaper (again, the Moseley case) and seven others had exactly one article.

n107. Because we found so few articles reporting defendant verdicts, we became concerned that we had missed several articles by including the plaintiffs' names in the search string--i.e., that articles about defendant verdicts might often not contain the plaintiff's name. To examine this possibility, we searched more intensively--without using the plaintiff's name--but only in newspapers published in the same metropolitan area as the trial was held (i.e., the papers that are most likely to cover each verdict). Doing this for twelve defendant verdicts in twelve different states, we found no articles at all that we had missed using the original (less inclusive) search string. (Searching without the plaintiff's name for all verdicts and for all newspapers is not practical because that would yield several thousand articles that would then have to be examined.)

n108. This pattern is consistent with findings by Bailis and MacCoun, who conclude that magazines tend to report disproportionately on tort litigation where plaintiffs win. See Bailis & MacCoun, *supra* note 11.

n109. Roughly 62 percent of the headlines in the articles we found indicate magnitudes of awards; the corresponding figure for articles about verdicts with punitive damages is roughly 58 percent.

n110. These include whether the trial was held in the metropolitan area in which the newspaper is published, whether total damages exceeded one million nominal dollars, the nature of the injuries sustained in the accident, the size of the defendant company, the recall history and recent sales levels of the vehicle involved in the trial, the importance of automobile employment in the area where the newspaper's readers live, the number of articles published by the paper on a typical day, and the amount of space the newspaper typically gives to business news.

n111. Of the 3680 total observations, 314 (about 9 percent) had a relevant article; of the 731 observations involving punitive damages, 180 (about 25 percent) had a relevant article.

n112. These outcomes are analyzed using extensions of multiple linear regression methods (i.e., maximum likelihood methods appropriate for such "limited dependent variables"). The dichotomous outcome was analyzed using probit analysis and the number of words using Tobit analysis. We considered also analyzing the determinants of page-one coverage, but this turned out to be too rare--with the exception of the Moseley verdict--to support such an analysis.

n113. Assigning other independent variables to their sample mean values except the variable indicating whether the total damages exceeded one million dollars.

n114. The corresponding analysis of numbers of words published suggests similar conclusions and is not discussed here.

n115. This is the amount of damages as first announced by (in all but one case) the jury.

n116. Some of the horizontal scale for this curve represents projection beyond the sample range of verdicts without punitive awards. The largest (real) total award without a punitive component is roughly \$ 46 million, and the next highest is \$ 30 million; seven others are between \$ 10 million and \$ 25 million. (The largest amount of real total damages for verdicts with a punitive component is about \$ 145 million.)

n117. The t-ratio associated with this estimated effect is 3.65, indicating that it is highly statistically significant.

n118. The t-ratio associated with this estimated effect is 5.01, indicating that it is highly statistically significant.

n119. If the newspaper is published in the same metropolitan area as the trial was held--which is true for about 1.8 percent of the sample observations--the probability of an article is much higher.

n120. This ratio declines as the size of damages increases. The range in the text corresponds to levels of total damages for which there are sample cases without punitive damages.

n121. An independent effect of the existence of a punitive component appears consistent with standard views in the journalism literature. In particular, a story is viewed as more newsworthy (and therefore more likely to lead to an article) if it involves more human interest. A dimension of human interest is conflict. It seems reasonable to suppose that a punitive verdict involves more conflict than a non-punitive one. (The dollar size of the award is viewed as a separate dimension of human interest.)

n122. Vanderbilt Television News Archive at Vanderbilt University makes and archives videotapes, and compiles and publishes an index of the evening news shows on the three major networks back to the 1960s. Burrelle's Information Services, Livingston, New Jersey covers CBS and NBC news shows and news magazine programs from the early 1990s onward. Journal Graphics, Inc, Denver, Colorado covers ABC news and news magazine shows and CNN programs from the early 1990s onward.

n123. Using the Vanderbilt database, we could search electronically--on the Internet--through brief abstracts of all items reported on the three networks' evening news shows. (*Television News Index and Abstracts*, *Vanderbilt Television News Archive*). We searched by company name and examined the abstracts of all items identified this way.

n124. Burrelle's and Journal Graphics are commercial services that sell transcripts of television programs. They are able to search for articles by topic, but they are not set up for research purposes, and we were unable to obtain detailed information about coverage of their databases.

n125. Burrelle's searched through their database for us using keywords we supplied--e.g., (automobiles or cars or trucks) and (liability or trial or verdict or safety or NHTSA or recall). We also requested separate searches using just the names of the three American automobile companies and the three largest Japanese companies (Toyota, Honda, Nissan). Burrelle's staff tell us that they search electronically through full texts of the transcripts that are available. For Journal Graphics we were able to obtain only a printed list of shows in their database classified as being about "automobiles"--which included roughly 1700 items--and read through brief descriptions to identify items triggered by product liability verdicts.

n126. We also found two other verdicts mentioned in television stories triggered by efforts to convince the NHTSA to recall particular vehicles.

n127. It is likely that other awards were lowered, but that this was not reported in the *Automotive Litigation Reporter*.

n128. This is especially true for television. The overturning of the Moseley award triggered some television coverage, but not as much as the original award.

n129. Garber, *supra* note 1.

n130. Because, for example, legal doctrine provides only vague guidance, application of doctrine by fact finders is hard to predict, decisionmakers have limited information about actual outcomes, and their processing of this information is subject to psychological biases.

n131. See, e.g., S.687 Hearings, *supra* note 4; S. Rep. No. 102-215 (1991). In addition, representatives of state organizations--such as the Conference of Chief Justices and the National Conference of State Legislatures--have opposed reform at the federal level on the basis of federalism concerns.

n132. A very prominent example is Peter W. Huber, *Liability: The Legal Revolution and Its Consequences* (1988).

n133. See 2 American Law Institute, *supra* note 30, at 8-9 (emphasizing that the focus of the policy debate on the size of the burden is misplaced); Viscusi, *supra* note 30 (same). Viscusi also argues that the question of efficient incentives is much more intricate than might be inferred from the policy debate.

n134. Doing so would hardly be easy conceptually, no less politically. Some have argued to me that this task is so hopeless that absent virtual elimination of product liability we will always have major undesirable economic effects; perhaps this is correct.

n135. It seems widely agreed by both plaintiffs' and defense attorneys that credible trial evidence of cost-benefit balancing--so-called "trading off lives against dollars"--makes punitive damages particularly likely. This is in stark contrast to the fact that economic efficiency--and deterrence aimed at economic efficiency--requires cost-benefit balancing.

n136. See, e.g., Garber, *supra* note 1, at 190-200 (discussing policies aimed at improving economic effects in the pharmaceutical and medical devices industries).

n137. I know of no comprehensive estimates comparing levels of cost and compensation in product liability litigation. Kakalik and Pace estimate costs and compensation associated with tort litigation completed in 1985. See James S. Kakalik & Nicholas M. Pace, Institute for Civil Justice (RAND), *Costs and Compensation Paid in Tort Litigation* (1986) (R3391-ICJ). Excluding (non-product liability) automobile accident cases, they estimate that tort litigation involved total transaction costs--i.e., the value of resources used to operate the system, not including compensation payments--of about \$ 11.0 billion and net compensation to plaintiffs--i.e., compensation payments net of plaintiffs' litigation costs--of about \$ 8.2 billion. See *id.* at xii tbl.S.4. Thus, within this broad category of tort cases that includes product liability, it cost the economy about \$ 1.34 in resources used to transfer each \$ 1 to plaintiffs.

n138. First, when injured product users receive any compensation, payments do not accurately reflect losses. See, e.g., Viscusi, *supra* note 30, at 52 ("Large loss claims tend to be undercompensated, and lower loss claims tend to be overcompensated."). Second, whether a plaintiff receives any compensation at all in a product liability case depends on various matters of chance such as the relative skills of the attorneys on each side, the composition of the jury, and the timing of case resolution relative to the timing of information about injury causation coming to light. Finally, regarding punitive damages, some, albeit relatively few, plaintiffs receive punitive damages and others don't across cases involving the same manufacturer behavior, and punitive damages are, in any event, not directly linked to the plaintiff's losses.

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