The Yale Law Journal

Volume 97, Number 3, February 1988

Article

Proposals for Products Liability Reform: A Theoretical Synthesis

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† William K. Townsend Professor of Law, Yale Law School. This paper benefited substantially from workshops held at the University of Southern California Law Center, the California Institute of Technology, the University of Toronto Law School, the Department of Economics at the University of Western Ontario, the University of British Columbia Law School, and the Yale Law School. Jules Coleman, Richard Craswell, Robert Rabin, Margaret Jane Radin, Gary Schwartz, Richard Stewart, Jeff Strnad, and Paul Weiler also made very useful suggestions. The Article is derived from a report I made as Associate Reporter to the American Law Institute Project: Compensation and Liability for Product and Process Injuries. The thoughts expressed here are mine, and reflect neither the views of other reporters on the Project nor the views of the ALI. The Article also was partly supported by a grant from the Sloan Foundation.

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The debate among practicing lawyers and legislators about products liability reform¹ has failed to consider much of the recent scholarship in the law and economics of contracts and torts.² In light of these literatures,

1. The results of this debate are reflected in actual and proposed legislative interventions that overturn various products liability rules. For example, bills have been introduced in past sessions of Congress to create a national products liability law. *See, e.g.*, S. 44, 98th Cong., 1st Sess., *reprinted in* PROSSER & KEETON ON THE LAW OF TORTS 1140-48 (5th ed. 1984). Also, many states have set caps on or eliminated recovery for various elements of the typical tort judgment, such as pain and suffering. *See, e.g.*, Act of July 24, 1986, 2 CCH Prod. Liab. Rep. ¶ 91,230 (to be codified at HAW. REV. STAT. § 663) (limiting pain and suffering awards in certain tort actions to \$375,000); MINN. STAT. ANN. § 549.23 (West Supp. 1987) (limiting awards for intangible losses to \$400,000).

2. The recent economic tort literature is too voluminous to permit full citation here. An excellent summary with many references and much of the author's original work is S. SHAVELL, *AN ECONOMIC ANALYSIS OF ACCIDENT LAW* (1987). Also helpful is W. LANDES & R. POSNER, *THE ECONOMIC STRUCTURE OF TORT LAW* (1987). Thorough descriptions of current doctrine are found in J. HENDERSON & A. TWERSKI, *PRODUCTS LIABILITY: PROBLEMS AND PROCESS* (1987) and M. SHAPO, *THE LAW OF PRODUCTS LIABILITY* (1987). The work of Robert Cooter, Richard Epstein, George Priest and Gary Schwartz has been more influential in the theoretical literature than the references made later herein suggest.

some seriously discussed reform proposals, such as a renewed commitment to the "fault principle," seem unhelpful;³ other apparently promising ideas do not appear on policymakers' agendas. This Article proposes solutions to products liability problems that integrate and apply the insights of the contracts and torts theorists. It evaluates both current law and these solutions under the dominant norm in the contracts literature: consumer sovereignty. This norm holds that the law should reflect the preferences of competent, informed consumers regarding risk allocation.

Section I first articulates the justifications for choosing products liability rules according to the consumer sovereignty norm. The Section then identifies the "optimal contract"—the contract that informed, competent consumers would prefer—for allocating product related risks. Section I concludes with the claim that this contract should govern products liability disputes—should be the law—unless the particular agreement at bar displaces it.

Section II begins by showing that the rules that constitute current strict liability doctrine diverge in two ways from the optimal contract that the consumer sovereignty norm implies. First, the substantive provisions of the legal rules differ from those of the optimal contract, in particular by imposing greater risks on firms than that contract would provide. Second, private parties are prevented from varying the legal rules by agreement. The putative consumer sovereignty justification for the disjunction between current law and the optimal contract rests on two factual premises. Initially, competent, informed consumers, courts incorrectly suppose, would choose sales contracts that require firms to pay compensation for all losses attributable to defective products as well as induce firms to invest optimally in safety. Further, market failure prevents unregulated markets from supplying these contracts. Market failure occurs first because consumers cannot understand contracts very well, thereby permitting firms to use contracts that result in consumers receiving less compensation and less safety than the consumers truly want. In addition, consumers systematically underestimate the likelihood and seriousness of the harms that products can cause. These errors ensure that consumer contracts would be unsatisfactory even if the state required them to be readable; consumers would mistakenly, though voluntarily, agree to insufficient protections. Section II-B argues that the evidence in support of market failure is too weak to support the contract-proscribing aspect of strict liability. Rather, markets should be permitted to generate the terms under which consumers purchase. This conclusion implies first that courts should enforce exculpatory clauses and contractual specifications of the

3. This suggestion has been made in U.S. DEP'T OF JUSTICE, REPORT OF THE TORT POLICY WORKING GROUP ON THE CAUSES, EXTENT AND POLICY IMPLICATIONS OF THE CURRENT CRISIS IN INSURANCE AVAILABILITY AND AFFORDABILITY 61-62 (1986).

seller's quality obligation, and second that when the parties' agreement is silent, courts should fill in the gaps with the appropriately derived optimal contract. Section II-C concludes this Article's discussion of current law by showing that a principal judicial response to perceived market failure, the use of design defect tests to regulate product quality directly, is unsatisfactory were market failure in fact to exist.

Section III follows the path begun in Section II-C. That is, Section III supposes both that consumer sovereignty should be the governing norm and that market failure prevents firms and consumers from implementing this norm by contract. The latter assumption is made not to undercut the principal argument in Section II, but rather because a complete reversion to a regime of freedom of contract for product-related risks may be a reform that history has foreclosed. If so, the task is to identify the policy responses to market failure that the consumer sovereignty norm best implies. Section III suggests three such reforms. First, courts' unsuccessful efforts to specify the safety levels that products must meet should be abandoned in favor of holding firms liable whenever their products cause harm. Second, courts should reinstate a contributory negligence defense. If firms are strictly liable unless consumers are contributorily negligent, products are likely to be optimally safe. If consumers' responsibility for safety is reduced below the level that a contributory negligence defense requires, the strict liability solution will cause firms to invest excessively in safety. The imperfect information rationale for today's strict liability assumes that consumers cannot make rational investments in safety. This assumption is incorrect; consumers need to know fewer and simpler things to behave carefully than they need to know to choose among contract clauses allocating product risks. It is therefore a mistake to relax consumers' obligation to take care.

Third, the standard-form contract imposed by law should allocate the risk that consumers will incur pecuniary harm to firms, but it should leave the risk that consumers will incur nonpecuniary harm on consumers; tort recoveries for pain and suffering and the like should be abolished. Well-informed consumers probably would contract for this risk allocation, so the law, following the dictates of consumer sovereignty, should provide it.

This Article is written in an exploratory spirit. Modern products liability law is less than three decades old. Understanding it requires answers to difficult questions about how markets allocate defect risks and how consumers respond to these risks. The economic and psychological theories required to answer many of these questions are primitive, and the empirical record presupposed by the theories ranges from scanty to nonexistent. When there is so much ignorance on fundamental matters, the law should assume a passive role. History has foreclosed this option, however: The state, largely through its courts, now regulates products extensively. The

goals of this Article are influenced by the fact that the legal structure rests on generally unproven positivist premises. The Article aims to clarify the issues on which law reform should turn, to exhibit the social science relevant to these issues, and to make the best grounded recommendations for reform that this record permits.⁴

I. THE CONSUMER SOVEREIGNTY NORM IN PRODUCTS LIABILITY LAW

A. *An Analysis of Consumer Sovereignty and Its Competitors*⁵

The consumer sovereignty norm may govern cases of both actual and hypothetical consent. In the former case, well-informed, uncoerced consumers actually consent to particular contract clauses. The consumer sovereignty norm uncontroversially supports enforcement of these clauses; the various moral theories to which Americans adhere respect truly consensual arrangements. In the latter case, affected consumers do not actually consent to the contract clauses for which enforcement is sought. Consent could be lacking because consumers are unaware of the clauses or their effects, or because the clauses are required by the state. In this second case, consumer sovereignty holds that courts should enforce only contract clauses to which well-informed, uncoerced consumers would have assented: when actual assent is lacking, courts should enforce clauses to which hypothetical consent is given. These clauses can be of two types: default rules, which apply when the contract at bar is silent, and required clauses, which courts impose on all contracting parties.

Consumer sovereignty also is an attractive norm when consent is hypothetical. Initially, giving hypothetical consent the force of real consent is justifiable on utilitarian grounds when the contract clauses that courts adopt as default rules or rules of law would maximize the utility of affected persons. Clauses achieving this result are identified first by supposing that persons prefer contracts that maximize their expected utility, and then by deriving the terms that this preference best implies. Section I-B employs this "consumer sovereignty method" to choose the optimal contract for product-related harms. A contract so derived may be thought to

4. This Article considers reforms that are broadly consistent with private law solutions to the defective products problem. For example, reforms such as required disclosure are analyzed, but proposals for significant institutional change, such as completely transferring products liability cases to an administrative forum, are not. The analysis below applies only to products liability issues concerning contracting parties, and not to tort law in general. This is because consumer sovereignty is most plausible as a governing norm in market contexts, where consumer choice can directly influence firm behavior. Finally, the Article omits consideration of causation issues, which would require a very lengthy analysis. An illuminating and thorough discussion of causation issues may be found in *Symposium on Causation in the Law of Torts*, 63 CHI.-KENT L. REV. 397 (1987). This author's views are briefly expressed in Schwartz, *Causation In Private Tort Law: A Comment on Kelman*, *id.* at 639.

5. Moral theories of tort are helpfully summarized in Coleman, *Moral Theories of Torts: Their Scope and Limits* (pts. I & II), 1 LAW & PHIL. 371 (1982), 2 LAW & PHIL. 5 (1983).

maximize utility tautologically, but this view is false. Uninformed persons may like the contracts they have and dislike new, "efficient" contracts that the state supplies or requires; as long as their ignorance is not dispelled, such preferences are possible.⁶ Such preferences do seem unusual, however, because inefficient contracts make people worse off than do efficient contracts; hence, people generally will prefer efficient contracts to govern their commercial lives, in which cost is an important consideration. Contract clauses that rest on hypothetical consent—that are derived by the consumer sovereignty method—thus are justifiable on utilitarian grounds.

The contract clauses that this method implies also seem justifiable on autonomy grounds. This conclusion may seem surprising because appeals to autonomy as a justification for rules become less persuasive as the consent to those rules becomes more hypothetical, and the rules the consumer sovereignty method selects are derived from the preferences of a utility maximizing "machine," not the desires of actual human beings. It is plausible to suppose, however, that real people do want to minimize the amount of risk to which they are exposed, but not to spend excessively on risk reduction. The consumer sovereignty method is a helpful heuristic to make the implications of this tradeoff precise. Consumer sovereignty rules also in practice are unlikely seriously to contravene actual assent because they are revokable. Firms can maximize profits by supplying consumers with contracts that differ from those which courts chose on the basis of incorrect assumptions about the preferences of actual people. Markets thus permit consumers in effect to revoke consent when decisionmakers mistakenly attribute it to them.

It is becoming customary, in philosophical circles, to identify autonomy-based rules not by stressing similarities between actual assent and utility maximizing choice, but by asking what rules persons would agree to were they made to choose in a situation stripped of morally irrelevant features. This is the method of "contractualism" as articulated by Rawls⁷ and more recently by Scanlon.⁸ Its object is to induce people to take an impartial point of view—to take others' interests into account as well as their own

6. Bernard Williams argues that when government creates the state of affairs that would have obtained had people acted on their idealized—that is, informed—preferences, "it is possible that" utility will actually be reduced because people "may never lose their errors and, if they do not, will never actually have the idealized preference the policy is designed to satisfy." B. WILLIAMS, *ETHICS AND THE LIMITS OF PHILOSOPHY* 88 (1985). Another possible difficulty is that reforms may not be adopted because people with mistaken views believe the reforms are not cost-justified and so prefer legislators not to adopt them. See Pauly, Kunreuther & Vaupel, *Public Protection Against Misperceived Risks: Insights From Positive Political Economy*, 43 *PUB. CHOICE* 45 (1984) (citizens often underestimate risks and misperceive impact of alternative ways of minimizing risks). The large amount of consumer protection legislation now in place suggests that this difficulty may not be serious.

7. See, e.g., J. RAWLS, *A THEORY OF JUSTICE* 11-12 (1971). Rawlsian and utilitarian original position analysis is illuminatingly discussed in D. MUELLER, *PUBLIC CHOICE* 227-57 (1979).

8. See Scanlon, *Contractualism and Utilitarianism*, in *UTILITARIANISM AND BEYOND* 103 (A. Sen & B. Williams eds. 1982).

when choosing legal rules. According to Rawls, whose approach is adopted here, impartiality is achieved by keeping the "rule choosers" ignorant of features of themselves or actual cases that would permit the choosers to advance their self interest at others' expense. Here, the task is to choose a "meta rule" for deriving products liability rules—an organizing principle for finding the terms of the governing standard contract. The persons who are to select this meta rule should be ignorant of their own wealth and the probability that they will be injured. Knowledge of these features could skew choice: Rich people could more easily absorb losses and thus may want laws that impose relatively high risks on consumers; persons highly likely to be injured may opt for generous compensation. On the other hand, because persons would not be choosing rules that will govern society's basic structure, such as a constitution, but rather a rule of decision that presupposes the existence of a basic structure, it is appropriate to allow them to know something about this basic structure. For example, people choosing a meta rule for torts should know that states provide workers' compensation and disability insurance, because they might prefer not to adopt a tort solution that would duplicate payment systems now in place.

Given this context, there are two candidates for the meta rule that should determine products liability law: maximin and utility maximization. The former directs persons to secure the best possible outcome in the worst state that could occur.⁹ People in the present version of an "original position" would realize that the worst state is to be injured and poor. To choose maximin would imply that the law should provide complete compensation in all possible future states, so as to include this worst state. Maximin is attractive to the very risk averse because its criterion makes only the worst conceivable social states relevant to the choice of rules. Less risk-averse persons would reject maximin because it can lead to quite costly laws. For example, as will be shown in Section I-B-1, a full compensation rule would be likely to force even normally risk-averse persons to purchase excessive insurance.

People who are being asked to choose a meta rule for products liability law, rather than settling on a basic social structure, would probably reject maximin in favor of utility maximization. They would know that the worst outcome—incurring serious, completely uncompensated injury—is substantially mitigated by existing social safety nets. Hence, the strongest motivation for choosing maximin is absent. The costs of maximin, such as having to make excessive insurance payments in the form of high prices, also bear most harshly on the poor, who by definition have the least disposable income. Thus, maximin is not especially desirable even though one may turn out to be poor. Further, the utility maximization criterion

9. See J. RAWLS, *supra* note 7, at 151–53.

does take ordinary risk aversion into account and implies the least costly rules.¹⁰ Consequently, people choosing in the circumstances presented here would prefer the utility maximization meta rule, the rule that the consumer sovereignty norm suggests. The rules derived by use of the consumer sovereignty method thus seem justifiable from an impartial point of view. It again appears that courts could use this method to establish default rules or the content of a strict liability doctrine.

A competing conception of tort law holds that the state should pursue corrective justice. According to this conception, victims should be permitted to sue those who have caused harm, unless defendants' actions were, in some morally relevant sense, privileged or otherwise justifiable.¹¹ Like the consumer sovereignty norm, the corrective justice theory favors enforcement when uncoerced, well-informed persons actually consent, before any injury occurs, to a contract that imposes substantial risks on them. The central premise of corrective justice is that it is unjust to deprive someone of property or personal integrity against that person's will. This premise supports permitting persons to waive their right to compensation—to agree to bear risks—in appropriate circumstances.

In the absence of actual consent, the question is whether corrective justice theory implies different legal rules than the hypothetical consent rules supported by the consumer sovereignty norm. Corrective justice theorists seem to have devoted little attention to this issue. The common corrective justice paradigms involve cases in which the parties do not bargain—where no markets exist. Corrective justice and consumer sovereignty seem consistent in bargaining situations because the consumer sovereignty norm seeks to replicate the choices of the same persons whose full integrity and autonomy corrective justice theorists want to protect. Hence, the conclusions this Article reaches with respect to products liability law, which governs relations between parties interacting in markets, should be taken as consistent with corrective justice views of tort law, at least until those views are given further expression.¹²

10. See *infra* Section I-B.

11. See, e.g., Epstein, *Nuisance Law: Corrective Justice and its Utilitarian Constraints*, 8 J. LEGAL STUD. 49 (1979); Weinrib, *Toward a Moral Theory of Negligence Law*, 2 LAW & PHIL. 37 (1983).

12. The analysis above presupposes the validity of methodological individualism—deriving legal rules from the constructive choices of autonomous self-interested persons. A competing methodological conception holds that people are socially constituted beings, and that legal rules necessarily reflect and should reinforce their social nature. On this view, it would seem questionable—perhaps circular—to assess present or proposed legal rules by people's actual or "reconstructed" preferences because those preferences themselves are a product of the legal culture. See Sunstein, *Legal Interference with Private Preferences*, 53 U. CHI. L. REV. 1129, 1145–58 (1986). This seems to imply, not that legal rules should be independent of the citizenry's wants, but that they should be chosen to encourage the formation of better preferences.

This method of analysis is not pursued here for two reasons. First, it is difficult to know what "better" means in the context of product liability problems. The rules favored in this Article are either implied by, or are consistent with, utilitarian and neo-Kantian notions of efficiency and autonomy. To utilitarians or neo-Kantians, that such legal rules would create or reinforce people's preferences for

B. *The Optimal Contract*

The consumer sovereignty norm can be implemented in products liability law in either of two related ways. First, the law can create the appropriate "default rule." A default rule is applied when the parties' contract is silent, and resolves disputes according to the contract that most well-informed persons would have adopted if they were to bargain about the matter. Since people are assumed in the theoretical literature to want to maximize utility, the default rule is derived by asking what contract clauses are utility maximizing. Second, the default rule can be hardened into a set of prescriptions that courts apply to resolve disputes without reference to the contract signed by the parties before them. The prescriptions are coercive in only a weak sense, however, since they reflect what informed people would prefer. The distinction between default rules and prescriptions implies that although an optimal contract can be constructed by determining what informed parties would have consented to, it is a separate question whether there should be freedom of contract (a default system) or strict liability (prescription). This Section follows this distinction by first identifying the optimal contract in general for defect risks. Since a well-informed consumer is interested in being compensated for harm and minimizing the amount of harm to which he is exposed, the "optimal" contract for such a consumer would: (1) compensate him for pecuniary harm, (2) probably not compensate him for nonpecuniary harm, and (3) induce the manufacturer to reduce the risk of harm when the steps the manufacturer could take to do so cost less than the reduction in risk these steps would avoid. Section I-B-2 then asks whether this optimal contract should be the default rule or should be made mandatory.

these rules and their associated policies is innocuous. A commitment to other moral theories might imply different legal rules that would create different preferences, but no such moral theories seem widely acceptable or attractive enough in the product liability context to pursue seriously.

Second, current theories about the relation between culture and preference formation suggest that culturally influenced preferences rest on a strong individualist base. See generally Wildavsky, *Choosing Preferences by Constructing Institutions: A Cultural Theory of Preference Formation*, 81 AM. POL. SCI. REV. 3 (1987). According to these theories, people have a few "master preferences" respecting what sorts of persons they are and, relatedly, what groups they want to identify with or join. People then deduce their views on concrete issues from the clues that group membership provides. For example, the relevant question for person A, a liberal, may not be what he thinks about foreign trade but what liberals like him think about it. It is difficult to apply this theory of preference formation, tentative as it is, to issues as detailed as whether courts should choose assumption of risk or contributory negligence as tort defenses. The best that apparently can be done is this: People across most of the political spectrum have a master preference for a market economy (on a high level of abstraction) because this economy provides many goods and services at less than prohibitive cost and with relatively little state coercion. The consumer sovereignty norm, as discussed above, is a useful heuristic for deriving preferences over concrete issues from this privately originated master preference. Hence, rules chosen according to this norm are not circular but rather reflect people's real wants, except when a rule so derived conflicts with rules derived from another master preference. Since such conflicts seem rare in commercial areas, consumer sovereignty should generally govern the choice of products liability rules. The optimal contract to be developed in Section I-B thus can justifiably be society's default rule or the law.

1. *The Insurance Decision*¹³

A firm that compensates consumers for the harms its product causes will reflect the expected compensation cost in the purchase price. An element of the price thus is an insurance premium, whose size ideally varies with the amount of "coverage" against loss that consumers demand. The provisions of the optimal contract respecting defect risks therefore will reflect the amount of insurance against these risks that consumers prefer. It is customary to identify this amount on the basis of three principal assumptions. First, a consumer will choose an insurance contract that maximizes his expected utility. Second, consumers' utility functions are "state dependent": They depend on the state of affairs arising after purchase of the product. The consumer's utility is lower in the state of the world in which the product is defective than in the state of the world in which it works perfectly. Third, firms offer insurance at actuarially fair prices; the amount of their premium equals the expected value of the risk against which the person insures.¹⁴

Given these assumptions, a consumer's goal is to equalize the marginal utility of money to him in both states of the world he may face. The marginal utility of money is the rate at which the consumer's satisfaction from wealth changes with changes in the amount of wealth he holds.¹⁵ The amount of satisfaction a dollar yields is a function of the importance of the needs it satisfies: A dollar that helps buy a meal for a poor and hungry person yields greater satisfaction than a dollar that would help the same person buy a yacht if he were rich. Since the satisfaction dollars bring changes with the significance of the needs dollars meet, the marginal utility of money varies with income.

To see why consumers who maximize expected utility will attempt to equalize the marginal utility of money in all possible states of the world, let the expected marginal utility of money be higher in possible state of the world *A* than in possible state of the world *B* because the consumer has a lower income or greater demands on his income in the former state. Then the consumer would want to shift marginal dollars from state *B* to

13. This Section applies theories principally developed in Graham & Peirce, *Contingent Damages for Products Liability*, 13 J. LEGAL STUD. 441 (1984); Rea, *Nonpecuniary Loss and Breach of Contract*, 11 J. LEGAL STUD. 35 (1982) [hereinafter Rea, *Nonpecuniary Loss*]; Cook & Graham, *The Demand for Insurance and Protection: The Case of Irreplaceable Commodities*, 91 Q.J. ECON. 143 (1977); see also Rea, *Contingent Damages, Negligence, and Absolute Liability: A Comment on Graham and Peirce*, 13 J. LEGAL STUD. 469 (1984) [hereinafter Rea, *Contingent Damages*]; Danzon, *Tort Reform and the Role of Government in Private Insurance Markets*, 13 J. LEGAL STUD. 517 (1984).

14. Because consumers dislike risk, they will pay a "risk premium" to avoid it. Thus, a competitive insurance price is equal to the risk value plus premium. See Schlesinger & Venezian, *Insurance Markets with Loss-Prevention Activity: Profits, Market Structure and Consumer Welfare*, 17 RAND J. ECON. 227 (1986). The analysis is unaffected by ignoring risk premiums.

15. To use an archaic illustration, suppose that a person receives sixteen utils of satisfaction from ten dollars and twenty one utils of satisfaction from eleven dollars. In this case, the marginal utility of money—the utility an additional dollar yields—is five utils.

state *A*, in which the addition of new dollars will yield greater satisfaction than the satisfaction lost in state *B*. Utility is maximized when no further shifts of wealth between possible social states would increase utility; this outcome is reached when marginal utilities are equal in all possible states.

Consumers equalize expected marginal utilities by purchasing insurance. For example, an accident may increase a person's marginal utility of money by creating a need for medical care. A seriously injured person is likely to use marginal dollars to satisfy more important needs, such as for medical services, than he would have satisfied with such dollars if no accident had occurred. If an accident would increase the marginal utility of money in this way, the competent, informed consumer would insure against it by buying a contract requiring a firm to provide him with extra dollars if he is hurt. Insurance thus shifts wealth from the state of the world in which the marginal utility for money is relatively low—the state in which no injury occurs—to the state in which it is relatively high—the state in which an injury happens. This analysis predicts, therefore, that consumers will insure against those risks whose materialization would increase their marginal utility for money. Identifying these risks can be a difficult empirical inquiry, but some aspects of the question seem obvious.

Certain forms of loss have two significant properties: They increase the marginal utility of money, and they are replaceable, dollar for dollar, by insurance. An accident that causes a consumer to lose wages creates such a loss. The consumer's marginal utility for wealth is higher in the state in which such an accident occurs than in the state in which it does not because the consumer has less wealth in the former state than in the latter and so will use marginal dollars to satisfy more urgent needs, such as for shelter or medicine. Further, since the accident causes only a monetary loss, it is fully replaceable by insurance. In consequence, the consumer could equalize his marginal utility for wealth across states of the world by purchasing full insurance against losses—for example, of wages—that both increase the consumer's marginal utility of money and can be completely erased by monetary payments. Losses with these two properties constitute what lawyers call "pecuniary" loss or harm; insurance theory thus predicts the existence of substantial private insurance against pecuniary loss. The wide use of major medical and disability insurance is consistent with this prediction.¹⁶ Therefore, the default rule should require firms to compensate consumers fully for pecuniary loss.

16. See Abraham, *The Cost of Attitudes*, 95 YALE L.J. 1043, 1049–50 n.16 (1986) (summarizing studies on private insurance). Complete insurance against pecuniary harm is seldom bought due to the problems of adverse selection and moral hazard. See *infra* notes 103–05 and accompanying text. Consumers' desire for such coverage underlies the large amount of private insurance that people do have, however. Workers' compensation provides similar substantial coverage, replacing 86% of lost income during the first year of disability. RESEARCH BRIEF NO. 12, WORKERS COMPENSATION RESEARCH INSTITUTE, INCOME REPLACEMENT FOR LONG-TERM DISABILITY 2 (1986). This percentage falls in subsequent years because of inflation, but transfer payments to injured workers are supplemented by

A more difficult question is whether, and to what extent, consumers would insure against other forms of loss. It sometimes is difficult to know whether accidents will increase or reduce a person's marginal utility for money. Consider a business executive who runs recreationally and who loses a foot in an accident. Suppose that she insured fully against her "replaceable" losses, such as medical expenses and temporary lost wages. Apart from these losses, the injury could increase the marginal utility of money for this consumer if it caused her to substitute travel or the symphony for running because these activities are more expensive. Her marginal utility could fall, however, if she substitutes reading for running. In the latter case, the consumer not only would want no insurance, but would prefer to shift dollars from the injury to the noninjury state—the reverse of the cases above—by betting against the accident happening. It is therefore difficult to say, as a general proposition, that people will insure against events that would only induce them to substitute other activities for those activities that accidents preclude.

This discussion implies that consumers will not insure against harms that reduce, or do not affect, the marginal utility of money. This implication has considerable normative significance because some theorists claim that pain and suffering and emotional distress exemplify such harms.¹⁷ Consider an accident that causes no financial loss but is very painful for two weeks, or an accident that kills a person's relative. Theory holds that a consumer will insure against such losses only if they would increase the consumer's marginal utility for money. This could occur, for example, if persons who expect to be in pain would want to put themselves in the position where they could eat caviar or wear mink as compensations. But whether people actually want the ability to console themselves in these ways, and so will buy insurance to permit such consolations, or whether people would choose just to suffer is an empirical issue. In the wrongful death context, the appropriate resolution of this issue is obvious. The motive for insuring is to be able to purchase substitutes in the state of the world in which one is injured, and this motive vanishes when it would be impossible to make such purchases. A person obviously could not buy substitutes were her suffering to culminate in death. Hence, the current practice of awarding pain and suffering damages in survival actions, as recompense for the suffering the victim experienced before death, is incorrect if the legal award is meant to provide the insurance coverage people would have been willing to buy before the accident. When the injured person survives, the pain and suffering issue is more difficult to resolve.

Commentators sometimes claim that people prefer not to insure against

social security disability insurance. *See id.*

17. *See, e.g.,* Danzon, *supra* note 13, at 521; Rea, *Nonpecuniary Loss*, *supra* note 13, at 47-50; Rea, *Contingent Damages*, *supra* note 13.

“mental” losses because they almost never do insure against them.¹⁸ This evidence is inconclusive, however, because supply-side difficulties may prevent firms from offering “mental loss” coverage. In particular, adverse selection problems could be very significant in the sale of insurance against mental harms. The intensity of pain or distress at another’s harm varies considerably across persons. Insurance companies cannot distinguish among potential insureds by the insureds’ capacities to suffer. Hence, the companies cannot charge higher premiums to persons who are more likely to experience mental pain and thus make claims. The penchant of consumers to “select adversely” against insurance companies—to need and buy more insurance if they are likely to suffer more—can prevent the creation of insurance markets. Insurance companies respond to their inability to distinguish among insureds on claim-related factors by charging such high rates to everyone that low-risk persons often refuse the coverage. It is difficult to sell insurance profitably when the pool of buyers is exclusively constituted of those who are high risks. Therefore, that consumers now do not buy pain and suffering insurance does not imply that they voluntarily eschew it.

Some evidence suggests that people may want coverage against pure suffering. Consumers, for example, sometimes purchase accidental death and dismemberment insurance that protects against particular dramatic events whose occurrence is easy to verify, such as the loss of a leg.¹⁹ A partial motive for this insurance probably is to receive dollars that in some sense will ease the mental pain of these traumatic losses. On the other hand, the premium volume for this insurance is so small that the insurance cannot reflect a large pain and suffering component.²⁰ And people do not routinely insure against the loss of children, even though such losses cause great emotional pain. It thus is difficult to infer whether people want insurance against pain and suffering losses from observing what they actually buy.

In addition to these empirical uncertainties, other factors also argue against including insurance for pain and suffering in a compensation-based rule. Consumers would prefer less than full insurance against accidents that cause only mental pain, even when these accidents would increase the marginal utility of money, because of “income effects.” Recall that such accidents increase the marginal utility of money only when vic-

18. See Danzon, *supra* note 13, at 524 (that less than one percent of total contributions for health benefits are for insurance against accidental death and dismemberment indicates low willingness to insure against pain and suffering); Ingber, *Rethinking Intangible Injuries: A Focus on Remedy*, 73 CAL. L. REV. 772, 785 (1985) (that no insurance company offers coverage for pain and suffering on first-party basis indicates insufficient demand for such coverage).

19. See, e.g., Danzon, *supra* note 13, at 524 (Fifty-seven percent of civilian work force carries accidental death and dismemberment insurance).

20. *Id.* Uninsured motorists coverage does compensate for pain and suffering, but this coverage is probably designed to provide insureds with the damages they could collect, including a pain and suffering component, if their injurers had been insured.

tims will purchase expensive substitute activities to assuage the utility losses from suffering. Such substitutes are sought in the states of the world in which accidents happen. The demand for most goods and services has positive income elasticity; people increase their consumption as their incomes rise. Because accidents make people poorer in a utility sense, people will purchase lesser amounts of substitute activities in "accident states" than they would have purchased if they had not been injured but instead had to give up goods that they then valued as much as they valued not suffering. Informed consumers will anticipate wanting lesser amounts of substitute activities in accident states than they would otherwise want, and so will make provision to buy less. In other words, consumers will not purchase full insurance.²¹ Therefore, the ideal legal rule regulating accidents causing mental losses that increase people's marginal utility for money would award victims partial damages. These damages would reflect the partial insurance consumers would want *ex ante*.²² The level of partial insurance consumers would want varies among people, however, so the law's manageable choices are full insurance—overcompensation—or no insurance—undercompensation. The issue is on which side to err. The remaining factors that should influence courts in deciding what consumers want imply erring on the side of undercompensation.

Intuition suggests that people would want to buy slight or no coverage against purely mental harms. As the runner illustration above showed, there is no good reason to suppose that, apart from causing pecuniary harm, accidents commonly increase persons' marginal utility for money. In addition, to buy mental loss coverage is, in effect, to sacrifice considerable present wealth in the form of insurance premiums to consume expensive vacations that will assuage whatever emotional distress accidents may cause. In the absence of evidence that spending money is a typical, or even common, response to grief and suffering, this motive for insurance seems unlikely. Finally, pain and suffering losses are difficult for firms to anticipate and verify. The likely response of firms to these problems is to charge high prices for the coverage. These prices make pain and suffering insurance a bad buy for most people, whether it is sold by manufacturers or by insurance companies. These three factors together imply that the more purely mental the loss, the less likely a consumer will want to insure against it.²³

21. A technical version of this argument appears in Cook & Graham, *supra* note 13.

22. An alternative measure of the appropriate damages level would be the amount people were willing to pay *ex ante* to reduce the probability of harm. See Rea, *Contingent Damages*, *supra* note 13. However, as discussed in Section III-B-2, it is difficult to measure the willingness to pay to reduce the risk of nonpecuniary loss.

23. Justice Traynor, a pioneer of strict liability, also argued in an early dissent against awarding pain and suffering damages in tort:

Such [pain and suffering] damages originated under primitive law as a means of punishing wrongdoers and assuaging the feelings of those who had been wronged. They become increasingly anomalous as emphasis shifts in a mechanized society from ad hoc punishment to orderly

To summarize, the optimal contract concerning product-related risks would pay firms to provide insurance against the core pecuniary losses that defective products could cause, such as lost wages, medical expenses, or property damage.²⁴ It is unlikely, though not certain, that this contract would require any insurance against what now are sizable and common elements of the standard products liability judgment: pain and suffering and emotional distress. The appropriate default rule, then, probably should allocate the risk of incurring pecuniary harm to firms, and the risk of incurring nonpecuniary harm to consumers. The appropriate prescriptive rule under strict liability must be consistent with the default rule if the animating norm is consumer sovereignty. Hence, given current evidence, the aspect of strict liability that prohibits firms from shifting the risk of incurring nonpecuniary harm to consumers cannot be justified by reference to the goal of compensating consumers for harm.

2. *The Product Safety Decision*

The insurance analysis above asked how the optimal contract should allocate the risk that harm will result from a firm's breach of its obligation to produce a safe product. The analysis here asks how an optimal contract would specify this safety obligation. It is helpful first to ask what an efficient safety obligation is. For convenience, suppose that consumers cannot affect safety but that firms can. Assume that if a certain accident were to occur, it would reduce consumer *A*'s utility by an amount equal to the loss of \$5,000. Consumer *A* would pay the firm up to \$50 to reduce this accident's probability by one percent. An efficient contractual safety obligation, then, would induce the firm to make its product this much safer if the cost of doing so would be below \$50, but not if it would cost more than this. An explicit contract clause therefore could require the firm to make "cost-justified reductions in the risk of harm." If these words were absent, the court should impose this obligation as the default rule.

Informed parties would seldom choose such a rule explicitly and would often contract out of the rule if it were to apply in default. This is because, as Section III-A will show, full application of this rule requires the court or jury to ask how much particular consumers would pay ex ante to reduce risks of harm by specific amounts, information which is extremely difficult to reconstruct ex post. Parties commonly respond to this difficulty by specifying the quality obligation. Contracts exclude implied warranties and then make express warranties or explicit promises.²⁵ Such clauses are

distribution of losses through insurance and the price of goods

Seffert v. Los Angeles Transit Lines, 56 Cal. 2d 498, 511, 364 P.2d 337, 345, 15 Cal. Rptr. 161, 169 (1961) (Traynor, J., dissenting) (citations omitted).

24. Any medical and other tangible costs associated with mental distress constitute compensable pecuniary harm under the rule argued for here.

25. These clauses sometimes require particular inputs to safety, such as a set of roll bars for a

the equivalent of the generic risk-reduction clause derived above, because informed consumers will only pay for safety levels or features that cost less than the risk reductions that consumers regard as worthwhile, and firms will make only those safety investments whose costs can be recovered from the consumers.

This analysis has several implications. First, the judicial role should be limited to enforcing the parties' contracts respecting product quality; there is little need to create default rules because contracts seldom are silent about quality. Second, courts should be reluctant to enforce contracts when consumers are uninformed; it is difficult to regard particular express warranties or quality promises as reflecting optimal tradeoffs between cost and risk reduction when consumers lack the data to assess risks. Third, significant difficulties arise if consumers actually are uninformed. In this event, the consumer sovereignty norm directs courts to create and enforce the contracts that informed parties would make. As shown above, there are two possibilities. First, courts could devise a version of the generic risk-reduction rule, assessing a firm's safety performance against the criterion of consumers' willingness to pay for safety. This could be done by choosing rules for damages that would induce firms, when making products, to equate the marginal cost of investments in safety with the marginal willingness of consumers to pay for safety. Second, courts could specify the quality levels below which products cannot fall or the safety features products must contain. Courts in products liability cases often do the latter: Design defect litigation seeks to specify minimum quality levels and required safety features. Both this effort and the generic risk-reduction method seem undesirable policy responses, for they presuppose that courts and juries can assess consumer tradeoffs between safety and risks, and there is no reason to believe that courts possess this ability to any great degree.

II. STRICT LIABILITY AND MARKET FAILURE

A. *The Strict Liability Doctrine*

Strict liability is a judicially created doctrine that regulates the risk allocation aspects of transactions between manufacturers and consumers and between manufacturers and employees. Its rationale can be summarized by three propositions. First, the law should serve two functions: to create incentives for manufacturers to produce safe products and to ensure the provision of a peculiarly private form of social insurance, supplied by firms. Second, these two functions are complementary, not conflicting; both imply strict manufacturer liability. Third, private markets cannot

tractor; specify performance standards, such as that materials can be fed at the rate of X feet per second but no more or that the machine must produce a certain amount of product a day; or specify a general quality level, such as that there are no defects in materials or workmanship.

provide appropriate safety incentives or sufficient insurance, largely because the consumers and employees who operate in them are imperfectly informed. Hence, courts should impose the risks of product accidents so as best to serve the law's safety and insurance functions.²⁶

The strict liability doctrine has three distinct but related facets. First, it removes products liability cases from the law of sales. This result is achieved, in large part, by abolishing vertical and horizontal privity barriers so that any injured individual may sue the manufacturer directly.²⁷ This first facet of strict liability also prohibits firms from shifting product-related risks to consumers; instead, firms must compensate consumers for all harm to person or property that defective products cause.²⁸

Second, strict liability also regulates product quality. The reach of such regulation becomes clear when we consider the ways in which a product may be found defective. A product may have a "manufacturing defect" if it fails to comply with the maker's own standards, such as a car with wheels that lock. It may have a "design defect" if it meets the maker's standards but those standards are too low, such as a tractor without stabilizer bars. Finally, it may have a "warning defect" if the maker fails to inform the consumer of what constitutes safe use or fails to disclose hazard information; a drug sold without proper instructions or without a warning that persons with particular allergies should avoid it has such a defect.

Liability for manufacturing defects is truly "strict" because a plaintiff need only show that a firm failed to comply with its own standard to prevail; there is no need to prove that the noncompliance arose through negligence. Liability for design and warning defects has significant negligence aspects, however, because the plaintiff must show that the defendant's conduct fell below a legally prescribed standard: A firm's design is defective only if the design generated costs net of benefits, and in most states its warning is defective only if the warning failed to reflect facts

26. See, e.g., *Henningsen v. Bloomfield Motors*, 32 N.J. 358, 161 A.2d 69 (1960), which explicitly held warranty disclaimers to be unenforceable as applied to personal injuries and added another basis for strict liability: that manufacturers often have monopoly power and exploit it by supplying contract clauses about liability that consumers do not want. *Id.* at 391, 161 A.2d at 87. Section II-B, *infra*, shows that firms with market power are unlikely to adopt "one-sided" contracts, but rather exploit their power by raising prices. The intellectual process that facilitated the widespread adoption of strict liability is thoughtfully described in Priest, *The Invention of Enterprise Liability: A Critical History of the Intellectual Foundations of Modern Tort Law*, 14 J. LEGAL STUD. 461 (1985).

27. See, e.g., U.C.C. § 2-318B (1976). This Article does not discuss the horizontal privity doctrine because it seems uncontroversially correct. Persons not in the chain of distribution, such as bystanders, must be allowed to sue firms that are in it, because otherwise these firms, not taking the bystanders' losses into account, will underinvest in safety. However, contributory negligence on the part of third-party victims should be a defense. See *infra* Section III-A.

28. For example, Justice Traynor, in refusing to enforce an exculpatory clause, explained:

Since Maywood Bell is strictly liable in tort, the fact that it restricted its contractual liability to Vandermark is immaterial. Regardless of the obligations it assumed by contract, it is subject to strict liability in tort because it is in the business of selling automobiles, one of which proved to be defective and caused injury to human beings.

Vandermark v. Ford Motor Co., 61 Cal. 2d 256, 263, 391 P.2d 168, 172, 37 Cal. Rptr. 896, 900 (1964).

about the product that the firm should have learned.²⁹ True strict liability exists for design and warning defects only in the sense that firms cannot contract out of design and warning liability.

Third, strict liability affects plaintiffs' conduct. Plaintiffs have less incentive to take care under the strict liability rule than under the negligence regime that preceded it.³⁰ Contributory negligence, under which the injurer is not held liable for accident costs if the victim has failed to take due care, is not a complete defense to an action in strict liability. In a significant minority of states, plaintiffs prevail unless they have assumed the risk.³¹ In the rest, the governing rule is comparative negligence, under which the injured and injuring parties are each assessed a fraction of the costs of the accident in proportion to their relative lack of due care.³²

The analysis in Section I-B showed that regulation according to the strict liability doctrine is problematic in two significant respects. First, the contract-proscribing aspects of strict liability drive a wedge between the law's compensation and safety goals. The compensation goal dictates that firms should be held strictly liable only for pecuniary harm, because this is all the insurance consumers probably want. The safety goal suggests that firms should be liable for more harm than this in order to create appropriate incentives for firms to invest in safety. If firms are liable for more harm, however, they will reflect this liability in their prices, and consumers will be forced to purchase excessive insurance. Second, the product regulation facet of strict liability—in particular, the design defect aspect—reflects judicial attempts to set quality standards, a task, it was suggested above, for which courts may be ill-suited.

Section II-B argues that the evidence in support of market failure is too weak to justify the strict liability doctrine. If this view is accepted, courts should "regulate" products only by enforcing the contracts that markets supply and by supplementing these contracts with the default rules that Section I-B derived. If this view is rejected, the question becomes whether

29. That strict liability as applied to design and warning defects is actually negligence seems to have first been pointed out clearly by Gary T. Schwartz. See G. Schwartz, *Foreword: Understanding Products Liability*, 67 CALIF. L. REV. 435 (1979) [hereinafter *Products Liability*]; see also G. Schwartz, *The Vitality of Negligence And the Ethics of Strict Liability*, 15 GA. L. REV. 923 (1981). Design and warning liability would be "strict," in the courts' view, if firms were held liable on the basis of knowledge about their products that was not reasonably obtainable at the time of sale but which came to light later. See, e.g., *Phillips v. Kimwood Mach. Co.*, 269 Or. 485, 494-95, 525 P.2d 1033, 1037 (1974) (en banc) (noting that true strict liability for design defects would involve examining only dangerousness of product and not surrounding circumstances and knowledge at time article was sold). Most jurisdictions assess product design by reference to what was technologically feasible when the product was sold.

30. A further description of this feature of strict liability can be found in S. SHAVELL, *supra* note 2, at 5-32.

31. This is the *Restatement* rule. See RESTATEMENT (SECOND) OF TORTS § 402A comment n (1965) (contributory negligence is not defense but assumption of risk is); see also *McCown v. International Harvester Co.*, 463 Pa. 13, 342 A.2d 381 (1975).

32. See, e.g., *Daly v. General Motors Corp.*, 20 Cal. 3d 725, 575 P.2d 1162, 144 Cal. Rptr. 380 (1978).

judicial specification of the quality obligation and strict liability for all losses are the best regulatory responses. Section II-C, consistent with its purpose of evaluating current law, concludes by arguing that the courts' current efforts to regulate product quality directly are misguided. Section III, whose task is to identify reforms, considers substitutes for judicial quality regulation and then takes up the problems of harmonizing the law's safety and compensation goals in a world in which consumers are assumed to be imperfectly informed.

B. *Strict Liability as Justified by Imperfect Information*

Strict liability is justifiable if firms routinely use suboptimal contracts. It is commonly claimed that firms do just this because "bargaining power" is "unequal."³³ This view reduces to the claim that firms exploit the existence of structural market power or the claim that they exploit imperfect information. The first claim is difficult to credit given that "restrictive" warranty coverage seems uncorrelated with market power.³⁴ The latter position is the subject of this and the next Section. To understand the pathology of imperfect information, it is helpful first to understand the anatomy of well-functioning markets. Suppose that many sellers and buyers for a particular product exist and the buyers want to insure with sellers against pecuniary loss. The competitive price for this insurance is \$50 (the failure probability times the expected loss equals \$50). Let firm #1 offer the product without insurance and firm #2 offer the product plus insurance costing \$65. If firm #3 offers the product plus insurance costing \$60, it will capture most of the buyers, except that firm #4 may then propose a sale with insurance costing \$58. As a result of competition, all firms will be compelled to sell insurance at its competitive price of \$50; the market will supply the optimal contract. On the other hand, let a particular consumer want a nonstandard contract, for example one that requires a large payment if the consumer incurs only pain and suffering. Since the costs to a firm of creating a special contract for one person will almost always exceed the gain to that person, and therefore the price he is willing to pay, this relatively unique consumer probably will be unable to purchase the insurance he wants. Firms commonly are responsive to the preferences of consumer groups, rather than the preferences of every consumer.³⁵

33. The classic statement of this position is found in Kessler, *Contracts of Adhesion—Some Thoughts About Freedom of Contract*, 43 COLUM. L. REV. 629 (1943); see also Whitford, *Law and the Consumer Transaction: A Case Study of the Automobile Warranty*, 1968 WIS. L. REV. 1006.

34. See Priest, *A Theory of the Consumer Product Warranty*, 90 YALE L.J. 1297, 1320-25 (1981). There also is little theoretical reason to believe that firms with structural market power will exploit consumers by supplying unwanted contracts rather than by raising prices. See *infra* text accompanying notes 38-40.

35. For further discussion of this point, see Schwartz, *A Reexamination of Nonsubstantive Unconscionability*, 63 VA. L. REV. 1053, 1064-66 (1977).

The consumer in the illustration actually is the victim of unequal bargaining power, but his plight seems not to call for a legal response. Some consumers probably want planes with couches and amphibious cars, and are the victims of unequal bargaining power in the sense that too few such consumers exist to make serving them in these ways profitable. But unless one believes that every commercial preference should be satisfied, regardless of its cost, a market that satisfies the preferences of consumer groups seems good enough. As we have seen, group preferences for contracts will be satisfied in competitive markets.

Markets may function less well than the example above implies because information in them is imperfect. The example rests on three information assumptions. First, consumers know what their contracts say. If a firm refuses to sell insurance—that is, disclaims—or sells it at a high price (the \$65 above) consumers know this. Second, consumers will shop for contracts they like, and therefore will know what options markets offer. Consequently, if firm #1 refuses to sell insurance but firm #2 offers it at a good price, consumers who want insurance will buy from firm #2. Third, consumers perceive risks correctly and can appreciate the effect on risk of product alterations. If a consumer has a one percent chance of suffering \$5,000 in pecuniary harm from an accident, the consumer knows he bears a risk of \$50, and would pay \$50 to a firm as an insurance premium. Further, if the consumer bears a risk of incurring pain and suffering, the consumer knows this too, and would be willing to pay a cost-justified sum to reduce this risk. When these three assumptions are satisfied, unregulated markets will supply optimal contracts.

These three assumptions seldom seem satisfied in consumer markets. The important questions, then, are what happens when the assumptions are not satisfied and whether strict liability in tort is the best legal response. Respecting the first assumption, no market can work well when consumers do not know what their contracts say. The term most relevant to this discussion is the warranty, and the sparse empirical evidence suggests that consumers do know the warranty coverage that firms supply.³⁶ Further, the best response to the failure of consumers to read contracts is to make them readable. The Magnuson Moss Act and state and local plain language laws have made progress in this respect.³⁷ It is unwise to respond to the “reading problem” by incurring the very large costs of the

36. See, e.g., Darden & Rao, *A Linear Covariant Model of Warranty Attitudes and Behaviors*, 16 J. MARKETING RES. 466 (1979). This data is unsurprising. The cost to a consumer of understanding a contract clause that is used in only one transaction may exceed the gain, but consumers make many transactions. If a family of related clauses appears often, the cost of learning what effect the clauses have is likely to be less than the gain. Clauses that set forth the seller's obligation in the event of product default exemplify a frequently used family of contract clauses; their content and language is similar in sales of cars, refrigerators, stereos, and so forth. Thus it is worthwhile to consumers to learn what these clauses mean.

37. Such laws are discussed in Ross, *On Legalities and Linguistics: Plain Language Legislation*, 30 BUFFALO L. REV. 317 (1981).

tort system when the problem probably can be addressed with cheaper and less intrusive regulatory methods.

The second information assumption, that consumers will "search" for desirable contract terms, also is unrealistic in its simple form, but its violation seems not to justify a tort law response. Though the data show consumer search to be fairly extensive,³⁸ especially for expensive items, shopping is costly. Also, shopping costs vary directly with the number of product "attributes," including contract clauses, that consumers inspect. Since complex products such as cars often have several attributes that consumers find salient, it seems sensibly cautious to suppose that consumers search too little to ensure that contract clauses perfectly reflect their preferences. Firms may exploit the power that a lack of shopping confers on them to raise prices above competitive levels.³⁹ In the example above, if too few consumers comparison shop, firms may sell them insurance, but for \$65 rather than the \$50 competitive price.

There seems little reason to believe that firms also exploit insufficient consumer shopping by "degrading" contract "quality"—by not selling insurance at all. The question facing a firm is whether it will do better—that is, maximize profits—by selling the contract clauses consumers want at excessive prices, or by selling clauses that consumers do not want at excessive prices. If consumers have a noticeable preference for a particular clause—in economic terms, have a significant willingness to pay—firms will do better, other things being equal, by satisfying this preference: the greater each consumer's willingness to pay, the fewer consumers each firm needs to recover costs and make profits. On the other hand, if the cost to a firm of supplying a particular clause is high in relation to consumers' willingness to pay for it, the clause may not be supplied. There is little reason to believe that cost considerations outweigh consumer preferences for standard insurance coverage against economic losses—after all, a great deal of this insurance is now sold. The same analysis also applies to clauses specifying quality obligations. Therefore, the likely response of firms to a lack of consumer shopping is to offer consumers the contract clauses they prefer, though at excessive prices.⁴⁰

To summarize, the rejection of freedom of contract that strict liability reflects is difficult to justify on the ground that imperfect information exists, if imperfect information is taken to mean that consumers do not know

38. See Westbrook & Fornell, *Patterns of Information Source Usage Among Durable Goods Buyers*, 16 J. MARKETING RES. 303 (1979).

39. See Schwartz & Wilde, *Imperfect Information in Markets for Contract Terms: The Examples of Warranties and Security Interests*, 69 VA. L. REV. 1387 (1983).

40. See *id.* for a more full development of the analysis in this paragraph. Also, when consumers can identify product quality accurately, so that imperfect information consists only of insufficient consumer search, firms are likely to supply consumers with the qualities consumers noticeably prefer. See generally Schwartz & Wilde, *Product Quality and Imperfect Information*, 52 REV. ECON. STUD. 251 (1985).

what their contracts say or do not search sufficiently for the contract clauses they prefer. The contract language problem is best remedied by legislative or administrative actions to improve contract readability, not by episodic judicial bans of particularly hard-to-read language. The consumer search problem is irrelevant to products liability altogether, since firms commonly exploit the existence of high search costs through price, not through inefficient warranty clauses. Further, the appropriate state response to the existence of high search costs is to reduce them, which courts cannot do. Thus, strict liability does not appear necessary on the grounds that the first two information assumptions made above may not be satisfied. Strict liability may be justified, however, if the third assumption—that consumers know risks of harm—is false.

1. *The Assumption that Consumers Know Risks*

Individual consumers can seldom price risks precisely; thus, if taken literally, this third assumption would rarely be satisfied. However, some forms of misperception are harmful, while others are not. This Section focuses on a form of misperception that courts and commentators commonly assume to cause harm: consumer optimism. Optimism refers to a consumer's belief that product-related risks are less serious than they really are. Optimistic consumers, it is thought, will demand less insurance and less safety than their better-informed selves would want.⁴¹ Such optimism is supposed to be common. This Section defines optimism, illustrates its effect on the decision to insure, considers the relation of optimism to the law's product safety goal, and analyzes the evidence as to whether consumers actually are optimistic.

2. *A Definition of Optimism*

The risk that a product will cause harm is the likelihood of a defect multiplied by the costs that the defect would create. Let p^* equal the true probability of a defect and C^* equal the true cost of a defect. Then the true expected value of the harm is $R^* = p^*C^*$. If R , p , and C are the consumers' subjective estimates of these parameters, then a consumer is "optimistic" if she believes that risks are lower than they actually are—that is, when for her $R < R^*$. Consumer optimism thus could occur when: (1) $p < p^*$ and $C < C^*$; or (2) $C > C^*$ but $p < p^*$ by enough to dominate any overestimation of defect costs; or (3) $p > p^*$ but $C < C^*$ by enough to dominate any overestimation of loss probabilities.

To discuss the possible effects of these forms of optimism, this Article makes four assumptions: (a) The probability and cost variables are not

41. This view is summarized in G. CALABRESI, *THE COST OF ACCIDENTS* 55-58 (1970); see also Spence, *Consumer Misperceptions, Product Failure and Producer Liability*, 44 *REV. ECON. STUD.* 561, 563 (1977).

necessarily correlated at the production stage; a firm can take actions that would reduce the likelihood of defects but not their costs when manifested, and can reduce the costs of defects but not their probability; (b) Consumers cannot influence either the likelihood or the severity of harm; (c) Consumers recognize changes in the relevant variables but may misassess the extent of these changes. For example, when a firm takes an action that will reduce the likelihood of harm, the consumer knows that she should change her estimate of p , but her change in this estimate may exceed or fall short of the true reduction; (d) Consumer estimates of p and C may be uncorrelated. A consumer, for example, may believe the likelihood of defects to be lower than it is in fact but predict correctly the magnitude of harm should a defect arise.

3. *The Decision to Insure*

Consumers will underinsure if they underestimate the risk of harm. For example, let $R^* = \$50$ and $R = \$30$. A consumer would insure against the "perceived risk" at a price of \$30, but no one would sell insurance at this price. Hence, the consumer will be underinsured—he will agree to too narrow a warranty. Whether consumers routinely underestimate risk levels is a complex question because assumption (d) above, that consumer errors in probability and cost assessments can be uncorrelated, permits "cross effects." A cross effect occurs when the consumer makes offsetting mistakes in p and C . For example, a consumer believes that the probability of harm is lower than it is in fact—"such an accident never could happen to me"—but also believes that accident costs are higher than they really are—"If I do have such an accident, I'll surely be crippled for life." Assumption (d) also implies that consumers could overestimate probabilities but underestimate costs—"Everything I buy breaks, but with this product at least there is little danger of physical harm." Because pessimistic mistakes—"everything happens to me"—could dominate optimistic mistakes—"at least I'll never get seriously injured"—it seems impossible to say a priori that optimism in risk assessment is routine. Consequently, requiring firms to bear the risk that consumers will incur pecuniary harm, rather than making this risk allocation only the default rule, cannot be justified without evidence of the extent to which optimism respecting risk levels actually exists. This conclusion would have to be modified if economic or psychological theory excluded the possibility of cross effects or held that optimistic mistakes commonly dominate pessimistic ones, but no such theory exists. Also, the assumption that consumer mistakes about probabilities and costs can be in different directions seems intuitively plausible. Whether consumers are systematically optimistic thus seems to pose a factual, not a theoretical, question.

4. *Imperfect Information and the Product Safety Goal*

Markets could produce insufficient safety for two information-related reasons. First, consumers may buy too many unsafe products. This is a "quantity effect." Second, each product that is purchased may be less safe than it should be. This is a "quality effect."⁴² Optimism of the kind just discussed could produce quantity effects. To see how, suppose that a firm has invested in accident reduction to the point where the cost of further investment would exceed the gain in increased safety. The firm's product is then optimally safe and poses a defect risk of R^* . If the firm disclaims liability and its customers perceive $R < R^*$, customers will suppose the total cost of the product to them—price plus risk—to be lower than it is in fact. As a consequence, they will buy more of the product than their better-informed selves would want. There also will be too many accidents, since the number of accidents usually varies directly with the number of products purchased. However, for the reasons set out in the previous Section respecting the insurance decision, whether this quantity effect actually occurs is a factual question: The conclusion that $R < R^*$ does not follow logically from the premise that consumers may underestimate the odds or costs of defects because cross effects are possible.

Whether unwanted quality effects will occur turns not on whether consumers are optimistic as to the current level of risk, but on how consumers' risk perceptions alter when firms alter risk levels by making (or deleting) safety improvements.⁴³ As will be seen, products could be less or more safe than informed consumers would want, even if consumers perceive current risk levels correctly. The effect of changes in risk levels on product safety will be illustrated by considering three cases and making two simplifying assumptions: (a) Consumers assess accident costs correctly—they can value the loss of a finger—but consumers may misassess probabilities of harm; optimism manifests itself in underestimates of the odds that defects will occur; (b) A firm can make its product safer only by reducing the likelihood of defects, not their cost. The firm's problem is to choose between selling the product unchanged or reducing the odds that it will injure.

In each of the following cases, suppose that consumers are optimistic as to the current risk level and firms then make a safety improvement. In the first case, consumers correctly perceive the effect of this change. Optimism respecting the risk level will then have no effect on product safety. Consumers who can correctly perceive changes in risks will buy any cost-justified change that the seller offers; optimal outcomes thus arise because consumers are perfectly informed. In the second case, consumers become

42. This quantity/quality distinction was first noticed by Calabresi, *see* G. CALABRESI, *supra* note 41, at 73, and systematically developed by later theorists.

43. The following analysis derives from Spence, *supra* note 41.

more optimistic as the product becomes safer. For example, the product in the illustration poses a .1 probability of harm in its unmodified state, while consumers believe the probability is .08. A firm then reduces the probability of harm to .08, but consumers believe the probability has fallen to .05. If consumers react to safety improvements in this way, firms will overproduce safety: People who overestimate the benefits of improvements will pay for too many improvements. For people who believe it is better to have fewer accidents than many, this second case has two desirable features. First, although too many products are purchased, because consumers perceive $R < R^*$ at all levels of risk, these products are excessively safe, so one bad effect—too many sales—is at least partly offset by the less bad effect—too much safety. Further, though consumers underinsure, because $R < R^*$, they buy excessively safe products; again, one bad effect works against the other. Matters are less clear from an efficiency viewpoint since the more errors there are, the further from the “Pareto frontier”⁴⁴ society may be.

In the third case, consumers become more pessimistic as the product becomes safer. This could occur if consumers inferred from the making of improvements that the product is dangerous. Suppose that in the example in the previous paragraph, the firm reduces the probability of harm from .1 to .08, but the consumer believes that the risk has been reduced from .08 only to .07; she is still optimistic, but by less than she previously was. Consumers who undervalue safety improvements—that is, who perceive risk reductions as being smaller than they are in fact—will underpay for safety, and firms will respond by underproducing it. Thus, if consumer optimism decreases as safety increases, not only will too many accident-causing products be purchased, but these products will be less safe than informed consumers would want.

The same three results would occur if firms could reduce defect risks by reducing the costs rather than the odds that defects will occur and if consumers could correctly perceive the odds but may misperceive the effect of reductions in costs. If consumers correctly perceive the effect of a seller's reduction in defect costs, firms will optimally reduce them; if consumers overestimate the effect of cost reductions, firms will reduce accident costs by too much; and if consumers respond pessimistically to changes in a product's ability to harm, firms will make suboptimal reductions in this ability.

When the assumption that consumers make only one mistake at a time is relaxed, matters become murkier. For example, in the second case above, consumers knew the costs of defects but overestimated the effect of

44. The Pareto frontier, also known as the utility-possibility frontier, is the set of allocative outcomes that are efficient in the sense that no person can be made better off without hurting someone else. For a basic discussion of this concept, see P. SAMUELSON & W. NORDHAUS, *ECONOMICS* 486–87 (12th ed. 1985).

a firm's reduction in the probability of harm. Firms overproduced safety as a result. This outcome would often occur when consumers mistake the probability and cost variables simultaneously, but not always. When consumers greatly underestimate the costs that defects could cause, reductions in defect probabilities that do not affect consumers' cost perceptions may cause consumers to react pessimistically. This is because consumers who believe the risk is very small will think there is little room for improvement and so may undervalue improvements that the seller makes. If many consumers perceive risks in this way, firms will underproduce safety.⁴⁵ On the other hand, if consumers overreact to safety improvements that reduce both the odds and the costs of defects, the optimism effect is exacerbated; more safety will be produced than in the second case above, in which safety already was excessive. Given the possibility of cross effects and the ability of firms to affect odds and costs together, it becomes very difficult to say as a theoretical matter just when consumer optimism respecting changes in either variable would result in too little safety.

To summarize, if consumers systematically misassess risk levels or respond inappropriately to manufacturer-induced changes in these levels, consumer contracts respecting safety are unlikely to be optimal. The strict liability response to the existence of imperfect information then requires courts to devise efficient solutions to quality problems, but the attempt to do this may entail serious difficulties. Hence, it is important to ask just what the data about consumer risk perceptions actually show.

5. *The Data*

The data are best approached by considering five null hypotheses: (1) Consumers misperceive the true level of risk they face; (2) Consumers' risk perceptions change inappropriately when true risks change; (3) Consumers accurately perceive risk levels (the reverse of (1)); (4) Consumers accurately perceive changes in risk levels (the reverse of (2)); (5) Con-

45. This conclusion may be put more formally. Suppose a safety improvement reduces the odds of a defect but not the cost, and let $p_1 - p_2 = k > 0$, where k is the consumer's perception of the change in the likelihood of harm—from p_1 to p_2 —as the result of a firm's additional investment in safety. Let the true reduction in the likelihood of a defect be $p_1^* - p_2^* = m > 0$. Then the perceived reduction in risk is $\Delta R = kC$, where C is the consumer's estimate of the costs that defects can create. The true risk reduction is $\Delta R^* = mC^*$, where C^* is the true defect cost. If consumers believe that safety improvements reduce the odds of defects by more than the true value—that is, consumers are optimists about changes in the odds—then $k > m$. For consumers to be optimistic about changes in the risk of default, they must perceive $\Delta R > \Delta R^*$. If we substitute for R and rearrange terms, we see that consumers will respond optimistically to safety improvements when $C > C^* \cdot m/k$. Supposing $k > m$, the quotient of the two is less than one. As a consequence: (a) If $C > C^*$, the inequality always is satisfied, so consumers respond optimistically to safety improvements; and (b) If C is small relative to C^* , the inequality may not be satisfied; consumers could respond pessimistically to safety improvements. As stated above, the intuition behind the second result is that if consumers are very optimistic about defect costs, believing them to be much lower than they actually are, they will not think there is much room for improvement in the safety of the product and so will underestimate the effect of a reduction in the likelihood of harm.

sumer risk perceptions can be made acceptably accurate by disclosure. The discussion below focuses on hypotheses (1), (3), and (5), because apparently no evidence at all has been collected on hypotheses (2) and (4). This is troubling, for without such evidence conclusions as to the desirability of strict liability are inevitably suspect.

The evidence fails to show that consumers misperceive risk levels to the extent that undesirable equilibria exist. Though one well-known study showed that farmers underinsured against flood damage,⁴⁶ later studies drew opposite conclusions about whether people correctly perceive risks. In one study, housing prices correctly reflected earthquake risks, being appropriately lower when these risks rose.⁴⁷ In another study, housing prices appropriately decreased with increases in the probability of defects.⁴⁸ Recent survey data showed that consumers have a substantial willingness to pay to reduce the injury rate from common household products such as drain openers; this willingness implied that survey respondents valued a hand burn from a chemical drain opener at \$120,000, for example.⁴⁹ This figure seems excessive, and thus suggests either that persons overestimate the costs of harm or are very risk averse when the issue is personal injury. These explanations in turn imply that people will not be underinsured and will put strong pressure on firms to produce safe products. Further, studies relating wages to risks of particular jobs show that workers appreciate risks to life and health and exact substantial wage premiums for bearing them; the greater the threat of injury and death from a job, the higher the wage demanded by workers.⁵⁰ This evidence implies, perhaps faintly, that markets in accident risks work adequately. Finally, consumers routinely purchase extended warranty coverage when buying expensive items such as cars and computers. This practice suggests an awareness of risk and a proper response by markets to this awareness.⁵¹

46. See H. KUNREUTHER, *DISASTER INSURANCE PROTECTION: PUBLIC POLICY LESSONS* 235-37 (1978) (summarizing study results).

47. Brookshire, Thayer, Tschirhart & Schulze, *A Test of the Expected Utility Model: Evidence From Earthquake Risks*, 93 J. POL. ECON. 369 (1985).

48. See Weicher, *The Market for Housing Quality*, in *EMPIRICAL APPROACHES TO CONSUMER PROTECTION ECONOMICS* 39 (P. Ippolito & D. Scheffman eds. 1986). A consumer spends more time evaluating a house than a less expensive product, but this cannot distinguish the housing studies. The essence of the risk underestimation claim is that because consumers are optimistic, they either misprocess information about risk or will not invest time in learning about it. Hence, they should be as optimistic about housing quality as they are about product quality.

49. W. Viscusi & W. Magat, *Right To Know and Behavioral Responses to Hazard Warnings* 11 (Duke University Center for the Study of Business Regulation 1986) (unpublished manuscript on file with author).

50. See, e.g., W. VISCUSI, *RISK BY CHOICE: REGULATING HEALTH AND SAFETY IN THE WORK-PLACE* 103-06 (1983) (summarizing other studies respecting risks to life); Saffer, *Wages and Hazardous Working Conditions*, 18 APPLIED ECON. 819 (1986) (discussing risks to health).

51. A possible counterexample is the substantial underutilization of automobile seat belts. See Arnould & Grabowski, *Auto Safety Regulation: An Analysis of Market Failure*, 12 BELL J. ECON. 27 (1981). Inferences from consumer nonuse are inconclusive, however. As one recent commentator observed, "discomfort costs, combined with time and inconvenience costs, can go a long way toward explaining much nonutilization." Warner, *Public Policy and Automobile Occupant Restraint: An*

In sum, evidence drawn from surveys and actual market behavior more strongly supports the view that consumers are informed than the view that they are ignorant.

Commentators sometimes claim that the cognitive psychology literature, which shows that people in laboratory experiments make systematic errors when processing information,⁵² supports the claim that consumers behave optimistically in markets. The references to this literature seem overdrawn. If the psychologists had a general theory about how people make decisions, and the theory generated predictions about what people will do in various circumstances, their experiments could be regarded as testing these predictions. Then, if the predictions actually were confirmed in the laboratory, it would be plausible to claim that the theory's view of how people decide matters in real life is correct, at least until the facts prove it false. Psychologists lack such a theory, however. They have instead a large set of observations about how experimental subjects behave. The external validity of this data is now in controversy for two related reasons. First, decision strategies that are inappropriate to laboratory settings often could be appropriate in real life.⁵³ Second, the tasks people are assigned in laboratories sometimes seem too artificial to support a strong inference that persons routinely misperform important tasks in their actual lives.⁵⁴ Consequently, it seems premature to make this experimental data the factual premise of important legal rules.

Further, the most relevant psychological claim and the data supporting it suggest that consumers are likely to be pessimists to the extent that they

Economist's Perspective, 19 ACCIDENT ANALYSIS & PREVENTION 39, 48 (1987). This paper reported that consumers' estimates of the chances of being injured in car accidents are too low, however. *Id.* at 42. Experiments also indicate that student subjects believe they are more likely than their classmates to experience desirable future events and less likely to experience undesirable events. Hoch, *Counterfactual Reasoning and Accuracy in Predicting Personal Events*, 11 J. EXPERIMENTAL PSYCHOLOGY: LEARNING, MEMORY, & COGNITION 719 (1985); Weinstein, *Unrealistic Optimism About Future Life Events*, 39 J. PERSONALITY & SOC. PSYCHOLOGY 806 (1980). Optimism, according to Professor Weinstein, apparently is a product of two conditions:

First, the event is perceived to be controllable, so that there are things one can do or contemplate doing to influence the event. Second, people have some degree of commitment or emotional investment in the outcome. Under these conditions, optimism arises because people compare themselves with an inappropriate standard: a person who does little or nothing to improve his or her prospects.

Id. at 814. The application of this idea to the product context is unclear. Weinstein's experimental subjects, for example, reported themselves to be somewhat less likely than their fellows to buy a car that turns out to be a lemon but more likely to be injured in an automobile accident. *Id.* at 810.

52. For a survey of this literature, see R. NISBETT & L. ROSS, *HUMAN INFERENCE: STRATEGIES AND SHORTCOMINGS OF SOCIAL JUDGMENT* (1980).

53. See, e.g., Einhorn & Hogarth, *Behavioral Decision Theory: Processes of Judgment and Choice*, 32 ANN. REV. PSYCHOLOGY 53 (1981) (considering complexities involved in evaluating discrepancies between optimal and observed human responses); Hogarth, *Beyond Discrete Biases: Functional and Dysfunctional Aspects of Judgmental Heuristics*, 90 PSYCHOLOGICAL BULL. 197 (1981) (examining problems with research that focuses on human judgment in discrete incidents, given that judgment actually occurs as continuous, interactive process).

54. See Lanning, *Some Reasons for Distinguishing Between "Non-normative Response" and "Irrational Decision"*, 121 J. PSYCHOLOGY 109 (1987); Macdonald, *Credible Conceptions and Implausible Probabilities*, 39 BRIT. J. MATHEMATICAL & STATISTICAL PSYCHOLOGY 15 (1986).

err in a particular direction. The claim holds that people process information in the order of its salience to them. This strategy may be misleading because salience supposedly is determined by application of the "availability heuristic," which directs people's attention to information that is vivid and easily summoned to mind rather than to more reliable statistical data.⁵⁵ Because negative information about products is often alarming, it has high salience. This psychological claim implies, and supporting evidence predicts, that consumers will attach disproportionate weight to negative data, and thus overreact to product-related risks.⁵⁶ Pessimism as to risk levels, if it exists, is less troublesome than optimism because it is less stable; firms have an incentive to dissipate it, since pessimistic consumers tend to purchase less. Therefore, the psychological studies suggest, if anything, that consumers are likely to err in the direction that would cause them the least harm.⁵⁷

The data also suggest that people can be taught to forego bad decision

55. R. NISBETT & L. ROSS, *supra* note 52, at 45-59.

56. See Weinberger, *Products as Targets of Negative Information: Some Recent Findings*, 20 EUR. J. MARKETING 110 (1986) (consumers are believed to attach disproportionate weight to negative information about products); Lynch & Srull, *Memory and Attentional Factors in Consumer Choice: Concepts and Research Methods*, 9 J. CONSUMER RES. 18 (1982); Mizerski, *An Attribution Explanation of the Disproportionate Influence of Unfavorable Information*, 9 J. CONSUMER RES. 301 (1982). More recent theory and evidence also suggest that persons are likely to be pessimists with regard to product information. Einhorn and Hogarth claim that people who perceive themselves as being uncertain about the probabilities they face form subjective probability estimates by a process of anchoring and adjustment; they choose a probability and then adjust it upward or downward depending on their attitude toward the decision at issue. This can be represented as $(p)=p+k$, where (p) is the subjective probability, p the anchor probability and k the adjustment factor. If $k>0$, the person adjusts upward. This will occur if he attaches greater weight to higher probabilities than lower ones. As applied to our subject, $k>0$ implies pessimism—the overestimate of defect likelihoods. Einhorn and Hogarth argue:

[A]ssume that people are generally cautious in assessing uncertain probabilities. When assessing loss probabilities, they should therefore give more weight to higher values of the (simulated) loss probabilities than to lower values. This will result in an overestimation of loss probabilities, especially in the low to moderate range.

Einhorn & Hogarth, *Decision Making Under Ambiguity*, 59 J. BUS. 225, 236 (1986). The authors claim that the theory applies to preferences regarding warranties (which relate to potential losses); the desire for warranties should be strong when loss probabilities are low to moderate, as they often are for consumer goods. Their experimental data are consistent with this prediction. More data on other aspects of the theory and a fuller statement of it are found in Einhorn & Hogarth, *Ambiguity and Uncertainty in Probabilistic Inference*, 92 PSYCHOLOGICAL REV. 433 (1985). Jonathan Baron also observes that when people are unsure of probabilities "people often behave as if they had assigned high probabilities to bad outcomes, thus avoiding actions that might lead to such outcomes even if these are the same actions that might lead to the best outcomes." Baron, *Second-Order Probabilities And Belief Functions*, 23 THEORY & DECISION 25 (1987); see also Oliver & Winer, *A Framework for the Formation and Structure of Consumer Expectations: Review and Propositions*, 8 J. ECON. PSYCH. 469, 490-91 (1987) (people make pessimistic predictions when information is lacking).

57. A thoughtful argument that regulation based on the current psychology literature is unwise is found in Scott, *Error and Rationality in Individual Decisionmaking: An Essay on the Relationship Between Cognitive Illusions and the Management of Choice*, 59 S. CAL. L. REV. 329 (1986). An example of the kind of work that Professor Scott probably had in mind is Lawrence, *Towards a More Efficient and Just Economy: An Argument for Limited Enforcement of Consumer Promises*, 48 OHIO ST. L.J. 815, 816-17 (1987) ("It is the thesis of this article that the adeptness of salesmanship and advertising combined with the limited information and analytical skills processed by a vast majority of the consuming public causes most consumer purchases to be irrational.").

strategies.⁵⁸ Further, there is considerable evidence that people respond rationally to the provision of information about risk.⁵⁹ Nor are people likely to "overload" when given a substantial amount of such information.⁶⁰ Disclosure solutions thus seem feasible.

Recall now the null hypotheses set out above. The evidence supports rejection of hypothesis (1); it has not been proven that consumers misperceive risk levels. The evidence fails to support rejection of hypothesis (5); disclosure solutions and education seem promising ways to cure consumer errors. The evidence as to hypothesis (3), that consumers perceive risk levels accurately, is less clear. It apparently is more difficult to justify rejecting hypothesis (3) than to justify accepting it, but the issue is close. With matters in this state, the disclosure solution is best.

Disclosure solutions are expensive, however, and the question remains what courts should do now. Lawyers commonly answer such questions by using largely unstated "tiebreaker" rules. The most influential tiebreaker in torts is to compensate victims. This tiebreaker seems to require courts

58. See, e.g., Nisbett, Krantz, Jepson & Kunda, *The Use of Statistical Heuristics in Everyday Inductive Reasoning*, 90 PSYCHOLOGICAL REV. 339 (1983) (training in statistics has marked impact on reasoning about everyday problems).

59. See, e.g., Hoch, *supra* note 51 (optimism is moderated by provision of appropriate information); D. KANOUSE, S. BERRY, B. HAYES-ROTH, W. ROGERS & J. WINKLER, *INFORMING PATIENTS ABOUT DRUGS 3* (Rand Report No. R-1800-FDA, 1981) (patients read and learn from prescription drug leaflets); Slovic, Fischhoff & Lichtenstein, *Accident Possibilities and Seat Belt Usage: A Psychological Perspective*, 10 ACCIDENT ANALYSIS & PREVENTION 281 (1978) (people react more favorably to seat belts and air bags when presented with more salient risk information); Viscusi & O'Connor, *Adaptive Responses to Chemical Labeling: Are Workers Bayesian Decision Makers?*, 74 AM. ECON. REV. 942 (1984) (workers react appropriately to provision of information about chemical hazards); Weinstein, Grubb & Vautier, *Increasing Automobile Seat Belt Use: An Intervention Emphasizing Risk Susceptibility*, 791 J. APPLIED PSYCHOLOGY 285 (1986) (seat belt use increased through educational campaign); Weinstein, *supra* note 51. In addition, recent experimental evidence shows that "subjects can make wide use of statistical information when they realize its situational applicability" and "in fact . . . are quite capable of using a wide array of statistical notions . . ." Kruglanski, Friedland & Farkash, *Lay Persons' Sensitivity to Statistical Information: The Case of High Perceived Applicability*, 46 J. PERSONALITY & SOC. PSYCHOLOGY 503, 515-16 (1984). See also Camerer, *Do Biases In Probability Judgment Matter In Markets? Experimental Evidence*, 77 AM. ECON. REV. 981 (1987) (Wharton students do not ignore or underweigh prior probabilities, and prices their behavior generates in experimental markets are close to those that would be generated by Bayesian traders—i.e., rational, informed persons). Recent survey research also suggests that awareness of risk can be increased substantially by appropriately detailed warnings. See Viscusi, Magat & Huber, *Informational Regulation of Consumer Health Risks: An Empirical Evaluation of Hazard Warnings*, 17 RAND J. ECON. 351 (1986). A less sanguine view about people's responsiveness to disclosure is presented in Slovic, *Informing and Educating the Public About Risk*, 6 RISK ANALYSIS 403 (1986), but Professor Slovic, in concluding, responds to the views of some that the difficulties of providing risk data are "insurmountable" by stating: "This seems an unreasonably pessimistic view. Upon closer examination, it appears that people understand some things quite well In situations where misunderstanding is rampant, people's errors can often be traced to biased experiences, which education may be able to counter." *Id.* at 414. This view apparently is gaining adherents. See, e.g., Bettman, Payne & Staelin, *Cognitive Considerations in Designing Effective Labels for Presenting Risk Information*, 5 J. PUB. POL'Y & MARKETING 1 (1987) (arguing that properly designed disclosure can increase consumer risk awareness).

60. The objection that disclosure of information respecting harm is unwise because consumers will not absorb, or will become confused by, the data is weak, given available evidence. See Grether, Schwartz & Wilde, *The Irrelevance of Information Overload: An Analysis of Search and Disclosure*, 59 S. CAL. L. REV. 277 (1986).

to refuse enforcement of exculpatory clauses and to attempt to create optimal safety obligations, as does present legal doctrine. Sections I-B and III-B together argue that, regardless of what is assumed about consumer knowledge and even if one takes the law's compensation goal seriously, exculpatory clauses should be banned under this first tiebreaker rule only insofar as they shift the risk of pecuniary loss to consumers.

Another frequently used tiebreaker supports the case for freedom of contract. This tiebreaker holds that the state should neither require nor prohibit behavior unless the justifications for doing so are clear. The preference for passivity in the face of ignorance acquires special force when the actions in question would impose high costs on affected persons. The strict liability resolution implied by the first tiebreaker requires consumers and firms to make a particular insurance contract and no other, and to obtain the level of safety that seems best to courts and juries, yet the factual basis for these strictures is weak. The strict liability regime also is costly to the parties and the state.⁶¹ This second tiebreaker therefore implies that courts should permit exculpatory clauses and enforce whatever quality obligations unregulated contracts contain—that, in short, strict liability should be repealed.

The two tiebreakers follow from different attitudes toward risk and a different weighing of values. The first tiebreaker holds that, when the facts are in doubt, the state should pursue the strategy that minimizes the risk of serious disruption in people's lives. Strict liability best achieves this result because it compensates the most victims. The second tiebreaker holds that, when the facts are in doubt, the state should pursue the strategy that minimizes government intrusions into people's lives. Although this strategy may create risks of serious disruption for some, these intrusions are minimized when people are permitted to set the level of their exposure to risk through the contracts they make. This second strategy is more consistent with the autonomy-promoting aspect of the consumer sovereignty norm, but its pursuit is not required by this norm; the respect accorded autonomous choices should fall as the belief that those choices are informed becomes less plausible. Since this Article's purpose is as much clarification as recommendation of reforms, it will conclude this discussion with the observation that the answer one gives to the question whether courts should impose strict liability or not depends on the tiebreaker one uses—that is, on the values one is least willing to sacri-

61. A recent study prepared for The RAND Corporation estimated that in 1985 the nationwide expenditure for tort litigation was between \$16 and \$19 billion, not including the net compensation paid to plaintiffs. These costs primarily involved legal fees and court costs. When the cost of time devoted by the parties to litigation is included, net compensation paid constitutes 46% of the total costs the system incurred (52% without time costs). See J. KAKALIK & N. PACE, *COSTS AND COMPENSATION PAID IN TORT LITIGATION* (Rand Report No. R-3391-ICJ, 1986). Similar estimates are made in Schotter & Ordover, *The Cost of the Tort System* (Economic Policy Papers, New York University Department of Economics, Mar. 1986) (unpublished manuscript on file with author).

fice—supposing the facts could leave a reasonable person in doubt. For the reasons given in Section I, if strict liability is chosen, the consumer sovereignty norm should determine the rules that constitute the strict liability doctrine.

Courts in fact have chosen strict liability, and reflect this choice in their abandonment of contract as a risk allocation mechanism and in their efforts to regulate product quality directly. Even if rejecting contract is justifiable, it is a separate question whether the *current* control over product quality that courts and juries attempt to exert is justifiable. This regulation, it will be argued below, has been unfortunate. Section II, in sum, criticizes existing law in two fundamental respects, first for adopting strict liability (discussed in Section II-B, *supra*) and second for adopting an unwise form of strict liability (discussed in Section II-C, *infra*).

Two important aspects of the law's present focus on product quality, however, seem sound. First, firms are held to their own promises or representations about quality; this is the law of express warranty. Second, firms are required to meet whatever quality standards they themselves have adopted; a particular item that falls below its maker's standard has a manufacturing defect that will support a claim for liability. These two rules create predictable obligations, are easy to administer, and seem implied by utilitarian and autonomy bases for legal obligations. Judicial efforts to establish quality obligations that do not depend on a firm's prior decisions respecting quality, in contrast, have been unsatisfactory.

C. *Design Defect Tests*⁶²

A consumer who is injured because of a product's design must prove that the design was "defective" to recover damages. Four defect tests are discussed: A product's design could be defective if the design (i) is more dangerous than the reasonable consumer would expect; (ii) causes accident costs that exceed the production costs of redesign; (iii) creates risks in excess of its benefits; or (iv) does not comply with applicable statutes or regulations. Tests (i), (iii) and (iv) are used in many jurisdictions, but test (ii) is not currently employed. None of these tests is satisfactory.

1. *The Expectations Test*

The "consumer expectations test" is undesirable because it is not really a defect test at all. A product fails the test when it is less safe than is reasonable for consumers to expect, but this raises the question of what

62. The recent law on design defects is well summarized in Twerski, *A Moderate and Restrained Federal Product Liability Bill: Targeting the Crisis Areas for Resolution*, 18 U. MICH. J.L. REF. 575 (1985). See also J. HENDERSON & A. TWERSKI, *supra* note 2, at 507-637 (1987); G. Schwartz, *Products Liability*, *supra* note 29. For an early recognition of the difficulty that the design defect cause of action creates for juries, see Henderson, *Judicial Review of Manufacturers' Conscious Design Choices: The Limits of Adjudication*, 73 COLUM. L. REV. 1531 (1973).

safety expectations are reasonable. Apart from a few obvious cases—it is unreasonable to expect cars to float but reasonable to expect them not to shed wheels on normal city streets—the reasonableness of safety expectations cannot be assessed without using the other tests. For example, it is unreasonable of consumers to expect cars to be as crash resistant as tanks because they know that the cost of this protection is likely to exceed the safety gains. The consumer expectations test in practice, therefore, either collapses into the other tests or protects interests distinct from consumer expectations. The test sometimes functions as a substitute for a contributory negligence defense in states where that defense is not permitted.⁶³ This occurs when the consumer can take a simple, obvious action to reduce risk, such as closing the cover before striking a match, or not using the television in the swimming pool, while the manufacturer would have to undertake a costly redesign to realize a similar degree of risk reduction. Courts find against injured consumers in these circumstances not on the ground that they were negligent, but because the products at issue were at least as safe as the reasonable consumer would expect.⁶⁴ The consumer expectations test also permits juries to hold manufacturers liable when other bases for liability are absent and the jury wants to compensate the plaintiff.

The consumer expectations test should be abolished. When the test functions as a proxy for other tests it is merely confusing. But as a means to allow juries to compensate plaintiffs when no basis for legal liability exists, the test is unjustifiable. And as a substitute for the contributory negligence defense, it is unnecessarily cumbersome since courts can reinstate the defense directly.

2. *The Learned Hand Test*

Test (ii) for design defects is the Learned Hand negligence rule, according to which an actor is negligent if the expected accident costs of his actions exceed his accident avoidance costs. This test is generally satisfactory, but unworkable as applied to product design issues. The test rests on the important though often unstated assumption that safety expenditures made in connection with an activity do not affect the benefits consumers derive from the activity. For example, a court using the test to decide whether it was negligent for a railroad not to install a device that prevented an engine from disgorging dangerous sparks can consider only the

63. See G. Priest, *The Disappearance of the Consumer from Modern Products Liability Law* 8 (Yale Law School Program in Civil Liability, Working Paper No. 53, Jan. 1987) (unpublished manuscript on file with author).

64. A representative case is *Vincer v. Esther Williams All-Aluminum Swimming Pool Co.*, 69 Wis. 2d 326, 230 N.W.2d 794 (1975) (product passed consumer expectations test when pool accident could have been avoided by consumer putting the ladder in safe position; manufacturer did not have to redesign entrance to water).

expected accident costs the device would avoid and its cost; the court sensibly assumes that the benefits people derive from using the railroad will not be affected by the legal outcome and can be ignored.

The assumption that expenditures on safety never influence consumer benefits is too strong, however. For example, knife blades sometimes injure people. The cost to firms of dulling the blades very probably is less than the costs of these injuries. The Learned Hand test thus would impose liability on knife makers. Courts, however, never reach this result because it is absurd to hold a manufacturer liable for failing to make a knife so dull it can no longer be used as a knife.

3. *The Risk/Benefit Test*

The valid lesson the knife example teaches is that the defectiveness of a product's design cannot be decided only by comparing the accident costs the design causes with the firm's cost of redesign. Such comparisons would require courts to penalize manufacturers for making knives, cars with sheet steel, and other useful products. Courts were thus led to test (iii), which asserts that a design is defective only if it generates risks exceeding its benefits.⁶⁵ Knives pass this test because their social benefits obviously exceed the cost of the injuries they cause. This latter lesson is invalid, however, because the risk/benefit test is unworkable in cases that are harder to decide than the knife case.

This point becomes clear if the risk/benefit test is stated precisely. Let Y be a vector of benefits consumers obtain from technologically feasible designs that could be used to produce generic product A . Design #1 generates benefits Y_1 , design #2 generates benefits Y_2 , and so on, where Y is the summary representation of all designs. Similarly, X is the production cost vector (design #1 costs X_1 , etc.) and Z is the accident cost vector (design #1 creates Z_1 of accident costs, etc.). If W is the social welfare vector, a firm subject to the law should select the design that maximizes the value of the expression $W=Y-(X+Z)$. The firm should produce the particular design, for example #8, that generates the greatest benefits (Y_8) net of costs (X_8+Z_8). When a firm is sued because its design allegedly was defective, the jury's role is to ask whether the firm chose the design that maximized social welfare. If the firm failed to do this—chose design #5 for example—its product is defectively designed.

The risk/benefit test is too difficult to apply because the benefit term Y is impossible for either firms or juries to ascertain. The benefits that particular designs would yield are experienced, in considerable part, as subjective mental states. These benefits vary across persons: Some people feel happiest with fast, light, inexpensive cars; others feel happiest with slow,

65. See, e.g., *Azzarello v. Black Bros.*, 480 Pa. 547, 559–60, 391 A.2d 1020, 1026–27 (1978); *Turner v. General Motors Corp.*, 584 S.W.2d 844, 850–51 (Tex. 1979).

heavy, more expensive but safer cars. Such mental states cannot be measured directly and translated into the dollar values the risk/benefit test requires.

This difficulty does not necessarily conclude the matter. In theory, there are ways of doing risk/benefit analysis that do not require the direct measurement of mental satisfaction.⁶⁶ But these methods are also beyond the ability of firms and courts to apply. For example, a relatively simple method for evaluating a project⁶⁷ is to use the Marshallian consumer surplus.⁶⁸ A decisionmaker applying this method would need to construct risk-adjusted supply and demand curves for all technologically feasible designs. First, he would have to construct the relevant family of supply curves for designs; each supply curve is the sum of a particular pair of X and Z cost elements. Then, he would attempt to estimate the demand curve that is associated with each supply curve. Doing this latter task requires the decisionmaker to predict the quantity of the product that consumers would purchase at each possible price given the product's design. In other words, as Section I-B-2 showed, the decisionmaker would have to ascertain consumers' willingness to trade off greater risk reductions for higher prices. Next, the decisionmaker would have to calculate the consumer surplus associated with each design under consideration.⁶⁹ A chal-

66. Current techniques of welfare measurement are explained and evaluated in R. BOADWAY & N. BRUCE, *WELFARE ECONOMICS* (1984).

67. A particular product design can be considered a "project" in the sense in which this term is used in the cost/benefit literature which aims to assist decisionmakers in deciding when particular projects should be adopted. *See id.* at 292-315.

68. For a critical analysis of this welfare measure, see R. TRESCH, *PUBLIC FINANCE: A NORMATIVE THEORY* 196-98 (1981).

69. This analysis may be clarified by a diagram:

In the picture, S is the supply curve, D is the demand curve and the equilibrium market price and the quantity sold are P^* and Q^* , respectively. Marginal buyers will pay no more than the market price for the product. If buyers are thought of as points on the demand curve, all buyers above the point that P^* represents derive "surplus" from being able to purchase at the market price, in the sense that they would still buy if the price rose. Their surplus is the difference between their willingness to pay—their point on the demand curve—and the market price P^* . The sum of these surpluses is the area represented by the shaded triangle. If sellers use a more expensive but safer design, the supply curve will shift up and to the left—it will take a higher unit price to call forth the same number of units—and the demand curve would shift up and to the right—buyers will pay more per unit because

lenged product would be defectively designed—its design would fail the risk/benefit test—if the consumer surplus associated with it is lower than the surplus that any other technologically feasible design would have generated.

This conceptualization of the risk/benefit test is sound in theory, but firms and juries cannot apply it in practice. Constructing the risk-adjusted supply and demand curves and associated Marshallian consumer surplus for a product in current use is a difficult task for experts; requiring juries to construct a family of hypothetical supply and demand curves is asking statues to dance.⁷⁰ In practice, no one constructs supply and demand curves or attempts to estimate any elements of the social welfare equation precisely. Rather, courts ask juries, or themselves decide, whether a design is “defective” or creates “unreasonable” risks, based on the story of the accident contained in the record and the conflicting testimony of the parties’ engineering experts as to the technical aspects of various designs. Consumers’ willingness to pay and the benefits that various incarnations of the product could generate necessarily play almost no role in decisions, and there seldom is evidence regarding the accident costs associated with these never-used designs. This procedure gives firms little guidance in constructing products and turns design defect litigation into a lottery. These outcomes should not be surprising: Courts perform poorly when asked to do tasks beyond their competence, such as complex cost/benefit analysis.

4. *The Regulatory Compliance Test*

Defect test (iv) has two aspects. First, it holds that a firm whose product fails to satisfy a regulatory standard (a “regulation”) is negligent per se.⁷¹ Second, it provides that a firm whose product complies with a regu-

the product is safer. If the new design reduces accident costs by more than its cost, the demand curve will shift more than the supply curve. As a result, the “consumer surplus triangle” derived from these new curves will be larger than the original triangle. Consequently, the unmodified product was not the best, in the welfare sense, that could have been supplied. The Marshallian consumer surplus is only a rough measure of welfare change because it ignores income effects, that is, changes in demand attributable to changes in wealth that result from new prices caused by different product configurations.

70. See Note, *Strict Products Liability and the Risk-Utility Test for Design Defect: An Economic Analysis*, 84 COLUM. L. REV. 2045 (1984). This student note recognized that the risk/benefit test requires a welfare analysis, but argued that “proxies” for consumer surplus measures exist that make the risk/benefit test manageable. These proxies are “industry standards . . . , government regulation, and the financial success of other manufacturers’ products” *Id.* at 2059–60. The Note does not explain how the study of a government safety regulation, or any other of these proxies, could determine which technologically feasible designs would generate the largest consumer surplus.

One might argue that the judicial system does not expressly regulate product quality under the risk/benefit test, but merely decides what is impermissible. This is a fine distinction when the issue in a case is whether a product is defective because it did not use shatterproof glass or contain an automatic shut-off switch, for example, and there is a finding of defectiveness. Also, delineating the set of permissible designs is itself an important form of regulation.

71. Hereinafter “regulations” will be used to refer to both statutes and regulations.

lation is not thereby exculpated; rather, compliance is just evidence relevant to the question whether the product is defective. A jury remains free to find the product defective on the ground that it failed another test.⁷² The regulatory compliance test is unsatisfactory for two reasons: (a) Agencies are better than courts and juries at devising regulations; and (b) Letting juries review regulations creates considerable uncertainty for firms. A rule that retains the first aspect of test (iv) but alters the second, so that compliance with a regulation is exculpatory per se, would be preferable. The principal justification for rejecting such a rule—for current law—is that any other rule would create incorrect incentives for firms to produce safety. This justification is unpersuasive.

Current law is unsatisfactory because administrative agencies are more likely than courts and juries to devise good regulations. This is not only because agencies often have more expertise, but also because there are economies of scale to regulation. Any regulator must answer two questions. First, what substantive standard should guide the choice of regulations? Second, what resource level should be devoted to deciding whether a proposed regulation meets the standard? A jury concerned with setting a quality standard does not make its own investigation but relies on the litigants for data. A private litigant will answer the second question asked by comparing the expected gain to her from discovering more information—the increased likelihood of winning the suit—with the expected investigation cost. If the technical and economic questions at issue are complex, private litigants will provide relatively little information unless the amount at stake is quite high. In contrast, for an agency, in theory anyway, the expected gain from discovering further information is a function of the benefits that better regulation will confer on all potentially affected persons. As this gain commonly exceeds the gain to any private litigant, an agency rationally would spend more than the litigant in investigating a particular design, were both to face the same budget constraint. Also, agencies generally have larger budgets than typical litigants have. Consequently, an agency commonly will have a much fuller record on which to evaluate a particular design than will a court or jury, and so will be more likely, other things being equal, to make a sensible evaluation. In addition, were compliance with regulations exculpatory per se, firms would be better able to predict their legal obligations. Perhaps a more vivid way to make these points is to observe that an appellate court would review an agency's regulation under the substantial evidence test, on the ground of

72. See, e.g., RESTATEMENT (SECOND) OF TORTS § 288C (1965). This aspect of the fourth test actually is a rule of construction that applies when it is unclear whether a safety regulation was meant to preempt common law interventions or to permit them to supplement its application. The discussion below supposes that the relevant regulation is the product of an institutional process that keeps abreast of technological change; regulations that have become outmoded by events should be supplemented by the courts unless the regulations were clearly meant to be exclusive.

agency superiority over courts in devising regulations, while lay juries in design defect cases review agency output *de novo*. This contradicts the received wisdom respecting the appropriate roles of courts and agencies in regulation.

However, making compliance with regulations exculpatory *per se*, it has been claimed, may create incorrect incentives for firms to produce safety when firms in a particular market all cannot produce safety at the same cost.⁷³ Each such firm should then be encouraged to produce safety until its marginal cost of doing so equals the marginal gain in reduced accident costs. Regulations, however, often are set such that products are as safe as they would be under a strict liability regime that induced the median firm in an industry to equate its marginal costs and benefits from further safety. Were compliance with regulations exculpatory, firms that could produce safety at below average cost thus would not be induced to equate their own marginal costs and benefits, and so produce more safety than the norm, but instead would invest only the industry average in making products safer. Consequently, a rule making compliance with regulations exculpatory *per se* would yield suboptimal amounts of safety.

This justification for current law is unpersuasive because current law also creates incorrect incentives for firms. To see how, suppose that under this law a particular regulation creates a safety obligation that is optimal for the median-cost firm in an industry; call this safety obligation Q^* . Let Q be the amount of safety each firm will produce under the regulation. Were all firms to be producing safety optimally, only the median-cost firm would choose $Q=Q^*$; firms that can produce safety only at high cost would set $Q<Q^*$, while low cost firms would set $Q>Q^*$.

Current law precludes this result. Initially, the rule that noncompliance with a regulation is negligence *per se* induces high cost firms to set Q at least equal to Q^* ; these firms thus overproduce safety. Nor does the rule making compliance with a regulation evidentiary only induce low-cost firms to produce the optimal amount. Today, juries are not instructed to hold liable firms that should, but failed to, choose a $Q>Q^*$. Such an instruction in fact would be unhelpful because reconstructing a firm's production function *ex post* seems beyond a jury's competence. Juries thus simply review regulations, holding liable firms that comply if juries believe the safety standard embodied in the regulation is too low, or exculpating firms if the standard is found acceptable. Hence, no firm subject to the regulation will be induced to equate its own marginal costs and bene-

73. See Shavell, *Liability for Harm versus Regulation of Safety*, 13 J. LEGAL STUD. 357 (1984). When all firms in an industry have the same costs, current law is desirable on safety grounds only if juries are better than agencies at setting safety standards. For the reasons given above, this seems unlikely. Courts do not distinguish between heterogeneous and homogeneous cost industries; rather, they seem to believe that allowing juries to sanction firms that have complied with regulations will produce more safety. This belief is correct but not germane: The issue is whether the increased safety is purchased at a price informed consumers would pay.

fits from producing safety. Instead, all firms will choose Q_s —decide how much safety to produce—by anchoring on Q^* ; that is, firms probably will suppose they can escape liability if they produce an amount of safety Q according to the rule $Q = Q^* + e$, where e is an error term. This term will be positive because juries are instructed always to hold firms liable that produce $Q < Q^*$ and will sometimes hold firms liable that produce $Q > Q^*$. Because the error term is a function of what juries are predicted to do, there is no reason to believe that Q_s chosen according to this rule will equate any firm's marginal costs with the benefits of producing safety.

Current law respecting compliance with regulations, in sum, induces firms with high costs for producing safety to produce an excessive amount of it while not ensuring that low-cost firms produce the correct amount. Changing the law to make compliance with regulations exculpatory will permit high-cost firms more closely to equate the marginal costs and benefits from safety but reduce the incentive of low-cost firms to make their products safer. The choice thus is between two rules neither of which can ensure that firms will produce the optimal amount of safety. Current law nevertheless is unsatisfactory because it is preferable for all firms to cluster around Q^* —to produce the amount of safety a regulation requires—than to cluster around a quality standard that is derived in considerable part from predictions about what juries will do. Agency expertise and access to information probably ensure that fewer distortions in the production of safety will exist when firms are closer to the former standard than to the latter.⁷⁴ Further, making compliance with regulations controlling on the defect issue will reduce uncertainty. The regulatory compliance test thus should be changed.⁷⁵

74. Were true strict liability to obtain, so that a firm would be held liable whenever its product caused harm and regardless of the precautions it took, firms would have an incentive to equate the marginal costs and gains of further safety. There would then seem little point to setting safety standards by regulation. Were an applicable regulation to exist, the better rule would be to make compliance with it exculpatory. The alternative would be to hold the firm liable whenever its product caused harm, since the adoption of true strict liability foreclosed the option of reviewing the firm's conduct. But to hold firms liable according to this rule would be to make the regulation a largely wasted effort.

75. Making compliance with regulations exculpatory would be undesirable if legislatures or agencies routinely require safety levels that are too low. This could occur if firms commonly "capture" the regulatory institutions. See generally T. Romer & H. Rosenthal, *Modern Political Economy and the Study of Regulation* (Carnegie-Mellon University Graduate School of Industrial Administration, Working Paper No. 3-85-86, Nov. 1985) (unpublished manuscript on file with author) (reviewing modern theory concerning how regulations emerge from political process). An excellent short treatment of capture theory is M. Spitzer, *Antitrust Federalism and Rational Choice Political Economy: A Critique of Capture Theory* (1987) (unpublished manuscript on file with author). Basing legal rules on the likelihood of capture seems unwise, however, because capture—the creation of regulations that reflect only the interests of firms—does not always occur and it is very difficult to determine when it has actually happened. The political economy literature considers the demand and supply side of the "market for regulation." See *id.* at 5-8 (discussing work of George Stigler). On the demand side, groups with low coalition costs and a comparative advantage at solving free rider problems have an above average ability to secure laws that benefit themselves at the expense of other groups. Producer groups sometimes have these characteristics, but other groups do also. For example, consumer, labor, and environmental groups have had considerable success in influencing health and safety regulation. This success suggests that some regulations will be influenced by capture by producer groups, but

D. *Summary*

The rejection of contract as a mechanism to govern product defect disputes required courts to devise a substitute. Their choice was to hold liable firms whose products cause harm when these products are "defective" according to standards that courts create and juries apply; the standards are embodied in "tests" of defectiveness. None of these tests is satisfactory. The expectations and risk/benefit tests are unworkable and the regulatory compliance test should be changed substantially. Even if the latter change is made, the question will remain what courts should do in the many cases where no applicable regulations exist. This and related questions are the subject of Section III.

III. PROPOSALS FOR REFORM

A. *A Substitute for Defect Tests: True Strict Liability with Contributory Negligence*

1. *The Substitute Described*

The seemingly insoluble difficulties with common law defect tests suggest abandoning the notion that a "defective" design is a prerequisite to liability. This Section argues that courts should give up the attempt to regulate products directly and proposes a rule under which firms would be held liable whenever their designs cause injury. Contributory negligence and assumption of risk, however, would be complete defenses. The solution is described intuitively. An Appendix contains a formal presentation.

Strict liability with a contributory negligence defense is attractive because it yields efficient results. Assume that consumers know what safe use entails and that total accident costs would be optimally reduced if both consumers and firms exercised care. A consumer who takes care incurs no accident costs; the proposed legal rule holds firms liable unless consumers are careless. On the other hand, a consumer who fails to take care bears

other regulations will not. It is questionable whether courts or juries could identify "captured" regulations accurately on a case-by-case basis.

When supply side considerations are added, the possibility of identifying regulations tainted by capture becomes even more remote. The supply side literature asks when legal institutions will "supply" laws that are in the interest of particular groups. *See id.* This turns out to be a complex question. Agencies are recognized to have "competing principals," such as oversight committees in legislative bodies, legislatures themselves, and various parts of the executive branch. Agency outputs are the result of a complex "game" between agencies, these principals, and the nongovernmental interests demanding or opposing regulation. Political theorists do not claim to be able to predict the outcomes of such games with great accuracy. Courts are unlikely to do better. Thus, the effective choice for courts is to presume that capture always happens or that it never does. To make the latter choice is to hold that the possibility of capture is irrelevant to the choice of common law rules. This is the better result because courts should have a presumption in favor of the legitimacy of the actions of coordinate branches of government. Hence, it appears best to adopt the rule that noncompliance with regulations is per se negligence and compliance per se exculpatory.

all accident costs; contributory negligence is a complete defense. Since a consumer's failure to take care will constitute contributory negligence only if the consumer's expected costs of care are lower than the expected costs of the accidents that care would avoid,⁷⁶ these informed consumers will by and large adopt the cost-minimizing strategy of taking care. Therefore, firms will incur all accident costs their designs cause. The cost-minimizing strategy for firms in this circumstance is to make optimal investments in safety—to invest in safety until the cost of further investments equals the gain in the reduction of expected accident costs. Because it induces both consumers and firms to reduce accident costs optimally, strict liability with contributory negligence is efficient.

This analysis makes strong assumptions about what consumers know. It is an open question whether its conclusion still holds when these assumptions are relaxed. To pursue this question, one should realize that what constitutes due care for a consumer is often a function of the firm's safety efforts. For example, if a car has good brakes, driving sixty miles an hour on a highway is not careless, although driving one hundred miles an hour might be; if the car has bad brakes, driving forty miles an hour might be careless. If contributory negligence is the failure to take the care that the circumstances warrant, a consumer who fails to drive slowly when the brakes are bad would be contributorily negligent. The analysis above argued that consumers will behave optimally in light of the actions taken by firms. It thus assumed that consumers know what steps firms have taken—that is, consumers know just how safe or dangerous products are. The assumption that consumers have perfect information is illegitimate, however; if consumers know how safe products are, there is no need for any form of strict liability, yet we suppose that some form of strict liability is justified because information is imperfect.

An appropriate definition of contributory negligence will cure this difficulty: Contributory negligence should be defined as a consumer's failure to take due care when using a product that is optimally safe.⁷⁷ In the illustration above, this rule would permit consumers to drive sixty miles per hour, but not one hundred miles per hour, regardless of the actual state of the brakes. A consumer who drove sixty miles per hour and was injured because the brakes were bad would not be contributorily negligent, and the firm would bear all costs. If consumers do not know how safe products are but do know how to use safe products, they will take the cost-justified care that safe products require for the reasons given. Consequently, firms will face all accident costs and will respond by taking due

76. Negligence is the failure to take cost-justified steps to reduce accidents.

77. This is the governing rule in many states. *See, e.g.,* *Daly v. General Motors Corp.*, 20 Cal. 3d 725, 735, 575 P.2d 1162, 1167, 144 Cal. Rptr. 380, 385 (1978).

care. Hence, the appropriate contributory negligence rule solves the problem of consumers misspecifying risks.

Current law deviates in two ways from the strict liability with contributory negligence solution. First, a sizable minority of states allow only a contributory negligence defense that resembles assumption of risk.⁷⁸ A consumer is required only to take the care that her actual knowledge of product safety requires. She is negligent if she drives sixty miles per hour knowing the brakes are bad, but is not negligent if she is ignorant of the true state of the brakes, yet speeds. This rule is inefficient. It creates an incentive for consumers to be careless and thus leads to excessive accidents and excessive investments in safety by firms to make up for consumer carelessness.

Second, jurisdictions that do require consumers to behave non-negligently commonly use comparative negligence. Under such a regime, consumer misbehavior reduces, but does not bar, recovery.⁷⁹ In the products liability context, a consumer is negligent when she fails to take the care that is required given an optimally safe product, and the firm is "negligent" if its product fails the risk/benefit test. When both parties are found negligent, the jury apportions liability between them. Comparative negligence, however, is an undesirable rule in products liability law.

To see why, realize first that comparative negligence is efficient if firms bear no accident costs when they are not negligent. In this event, firms can and will avoid all losses by complying with the due care standard, supposing it to be correctly set at the level where the marginal cost of safety equals its marginal benefit. Consumers will then bear all losses and also take due care because they cannot do better than avoiding only those losses it is worth it to them to avoid. Interestingly, the result that comparative negligence induces optimal behavior has been shown to hold in the case when both parties are negligent and the accident cost is apportioned between them according to some sharing rule.⁸⁰ A comparative negligence regime thus is unobjectionable, and perhaps on equity grounds desirable, when juries can assess the negligence of firms. The risk/benefit test is supposed to enable juries to do this in products liability cases, but this test is unworkable. If it is abandoned, comparative negligence must be abandoned as well because, when a consumer is negligent, there will remain no way to decide whether the firm should bear any portion of the loss; inquiries into the behavior of the firm are foreclosed *ex hypothesi*.⁸¹ In a

78. See *supra* text accompanying note 31.

79. See *supra* text accompanying note 32.

80. See Cooter & Ulen, *An Economic Case for Comparative Negligence*, 62 N.Y.U. L. REV. 201 (1987); Haddock & Curran, *An Economic Theory of Comparative Negligence*, 14 J. LEGAL STUD. 49 (1985); S. Rea, *The Economics of Comparative Negligence* (1986) (unpublished manuscript on file with author).

81. That comparative negligence cannot be combined with strict liability was pointed out in the *Daly* dissents written by Judge Jefferson and Judge Mosk, 20 Cal. 3d at 750, 757, 575 P.2d at 1177,

regime of true strict liability for firms, therefore, an optimal amount of safety will be produced only if contributory negligence is a complete defense to liability.

This legal regime will be more administratively efficient than current law because true strict liability greatly reduces the information demands on juries. The substantive issue in litigation will be: What constitutes optimal consumer care given that the product is safe? This question is much easier for juries to answer than the questions posed by the risk/benefit test.⁸²

Some may object that this question is as difficult for juries as those they now face. The objection is this: A consumer is contributorily negligent when the costs to her of behaving carefully are less than the expected accident costs that care would avoid. Yet consumer care costs in considerable part are opportunity costs: the detriment to a consumer of not exceeding the speed limit is the pleasure foregone from driving fast or the unhappiness of arriving late. Juries, the argument goes, are no more able to assess these opportunity costs than they are to measure consumer benefits from various designs. Hence, the solution of strict liability with a contributory negligence defense simply substitutes one insoluble measurement problem—determining consumer care—for another—applying the risk/benefit test.

This objection is unpersuasive because mental states have never been relevant in determining human actors' negligence. Considering mental states not only introduces a severe measurement difficulty, but also raises the utility monster problem. Thus, a tort defendant cannot claim that driving 100 miles an hour in a school zone was not negligence because she derived enough pleasure from frightening children to outweigh the utility losses to her victims and their parents. The negligence of real persons—here consumers—is assessed by asking whether they failed to follow directions, ignored warnings, or took actions that most people would regard as being more risky to others than the actions were worth. Whether

1181, 144 Cal. Rptr. at 395, 399, and in Levine, *Strict Products Liability and Comparative Negligence: The Collision of Fault and No-Fault*, 14 SAN DIEGO L. REV. 337 (1977). These analysts argued that contributory negligence should not be a defense in strict liability at all. Only the assumption of risk defense should be allowed, and it should bar all recovery so there would be no apportionment problem. The *Daly* majority responded to this argument by asserting that juries could reach a "fair apportionment of liability," 20 Cal. 3d at 738, because they would not be comparing fault but instead making an "equitable apportionment or allocation of loss." 20 Cal. 3d at 736. The "equitable" principles by which juries' decisions are to be governed were never set out.

82. The administrative advantage of the suggested reform can be obtained without incurring one of the disadvantages of a similar true strict liability regime, workers' compensation, which is a reduction in workers' incentive to be careful. Pure workers' compensation increases the incentive of firms to be careful but reduces the incentive of employees to be careful, especially if it increases the expected value of compensation over that of a tort regime. Thus, introducing a workers' compensation regime *simpliciter* could increase the accident rate in industries where employees have a comparative advantage at producing safety. See Fishback, *Liability Rules and Accident Prevention in the Workplace: Empirical Evidence from the Early Twentieth Century*, 16 J. LEGAL STUD. 305 (1987) (introducing workers' compensation increased rate of fatal accidents in coal industry).

a consumer has acted in this way in a particular case poses an easier question than those posed by the risk/benefit test. Accordingly, the suggested reform will have the administrative advantages claimed for it.

There is, however, a problem in putting such stress on defenses. The analysis above supposed that consumers always know what constitutes due care in connection with optimally safe products. Consumers sometimes may be less informed. For example, the appropriate dosage for a particular drug is seldom self-evident. This difficulty is met today by requiring firms to provide warnings.

2. Warnings

The law on warnings raises two questions: First, what is the legal effect of a good warning? Second, how good must a warning be? Warnings are used as evidence of whether a consumer assumed the risk or was contributorily negligent. The better the warning, the more likely that a verdict for the defendant will be upheld on appeal, and the more likely that a court will direct a verdict for the defendant.⁸³ A warning thus must be good enough to persuade the trier of fact that the consumer should have heeded it. This is an imprecise standard because its application turns out to be in considerable part a function of the trier's views about consumers' competence.

This Section argues that courts should attach greater evidentiary weight to warnings.⁸⁴ Warnings serve two functions: They indicate risk levels and provide directions for safe use. Disclosing risk level data is difficult because "point predictions," such as that a car has a .01 probability of a defect, may not accurately describe the likelihood of various harms. Probability density functions, however, are difficult to create and may not be helpful to many consumers.⁸⁵ Thus, firms frequently must use imprecise phrases such as "highly dangerous." As shown in Section III-A-1

83. See, e.g., *Baughn v. Honda Motor Co.*, 107 Wash. 2d 127, 727 P.2d 655 (1986) (clear warning that would have avoided accident was basis of summary judgment for defendant manufacturer).

84. Current judicial attitudes toward warnings are illustrated in *Watson v. Uniden Corp. of Am.*, 775 F.2d 1514 (11th Cir. 1985) (jury could find inadequate an instruction pasted on portable phone that read "CAUTION—LOUD RING. Move switch to talk position before holding receiver to the ear;" court gave no rationale and accident occurred when plaintiff forgot instruction); *Givens v. Lederle*, 556 F.2d 1341 (5th Cir. 1977) (jury could find that plaintiff should have been told that Sabin oral polio vaccine could, rather than rarely could, cause polio; risk of polio from vaccine was one in three million); *Fraust v. Swift & Co.*, 610 F. Supp. 711 (W.D. Pa. 1985) (jury could find failure to warn of hidden dangers for risk that 16-month-old child could choke on peanut butter sandwich); *Michael v. Warner/Chilcott*, 91 N.M. 651, 579 P.2d 183 (1978) (jury could find warning inadequate that instructed persons not to use sinus medicine for more than ten days without consulting a physician because prolonged use "may damage the kidneys"; plaintiff used medicine for eight years; court said warning should have added that drug was "dangerous").

85. A probability density function indicates the probability that a product will cause various levels of damage. For example, a simple density function would be that product X has a .01 chance of causing \$10 worth of harm, a .01 chance of causing \$100 worth of harm, and a .03 chance of causing \$50 worth of harm. Some consumers may have difficulty understanding more complex functions, and portraying them also would be difficult.

above, these instructions will permit consumers to behave optimally if consumers also are instructed as to what constitutes safe use, and are found to be contributorily negligent, or to have assumed the risk, if they fail to follow instructions.

What instructions are appropriate is a difficult question. Consider the following example:⁸⁶ Consumers do not know that a chemical product is flammable or how to reduce the danger unless they are told. The product label states "Danger! Product Flammable: Do Not Use Near Open Flames." This instruction is imprecise because "near" is a loose term; the product's propensity to harm could be eliminated simply by avoiding close proximity to open flame, or the product could be so volatile that its vapors would ignite were it used in a room with a stove pilot light. If the latter is the case, the label perhaps should have provided more information. Labels have little room, however, and therefore usually give only "category" instructions, such as "avoid open flames," which leave consumers with considerable discretion.

An implication of the unavoidable imprecision of a firm's communications about risk levels and instructions is that, viewed *ex post*, there always exists a warning and set of instructions that were not given and that would have induced the injured consumer to avoid injury. The actual communication did not prevent the accident and thus could have been more explicit. Therefore, warning cases often permit contradictory outcomes: either the warning and instructions may together be found exculpatory because the firm said enough, given the constraint of label size, or the warning and instructions may be found defective because too little was said to tell the "typical person" about the risk and means to avoid it. This is why warning cases are often resolved according to the decisionmaker's presuppositions about consumer competence. A judge either assumes, subject to the evidence, that consumers generally can draw the appropriate inferences from general warnings of danger and category instructions, or she assumes the contrary.

Many courts appear to make the latter assumption,⁸⁷ which implies

86. The illustration is drawn from two cases which evaluated the warning given with the sale of a contact adhesive that ignited while being applied in the home, causing serious harm to users. *Compare* *Burch v. Amsterdam Corp.*, 366 A.2d 1079 (D.C. 1976) (jury could find inadequate a warning that said "Danger! Extremely Flammable . . . Do Not Use Near Fire or Flame") with *Murray v. Wilson Oak Flooring Co.*, 475 F.2d 129 (7th Cir. 1973) (roughly similar warning adequate as matter of law).

87. *See supra* note 84. Courts also hold firms liable when accidents result from misuse of the product, if the misuse was foreseeable by firms. *See, e.g.*, *Micallef v. Miehle*, 39 N.Y.2d 376, 385, 348 N.E.2d 571, 577, 384 N.Y.S. 2d 115, 120-21 (1976). This rule is consistent with many courts' rejection of a contributory negligence defense since misuse would be contributory negligence. The rule sometimes may be justifiable as applied; victim misuse can imply an inadequate warning. On the other hand, misuse cases supply many of the horrors cited in the current debate about products liability reform. A typical example is *Moran v. Faberge, Inc.*, 273 Md. 538, 332 A.2d 11 (1975). In this case, the plaintiff successfully sued for injuries caused when her friend poured cologne on a lit candle to make the candle scented and the cologne ignited. The manufacturer had failed to warn that cologne was flammable.

that a legal solution to the design defect problem that relies heavily on defenses and warnings may work poorly. Three arguments suggest that warnings should be regarded as generally efficacious, however. First, the evidence cited in Section II-B-1 shows that consumers respond appropriately to the provision of safety information. Also, what constitutes safe use of many products is common knowledge or easily learned. Thus, it is plausible to suppose that typical general warnings and category instructions are adequate, subject to particular contrary evidence. Second, the commitment of juries to the compensation goal suggests that juries seldom will find contributory negligence when it is absent.⁸⁸ Therefore, the fear that consumers would bear excessive accidents costs in a world where adequate warnings are exculpatory seems unwarranted. Third, a commitment to consumer sovereignty is inconsistent with a general disbelief in the efficacy of warnings. This norm presupposes two claims: (a) People can perform adequately most of the tasks that life requires; and (b) Seeing to one's safety and making contracts in one's own interest are two such tasks. Few people would reject claim (a), for doing so would call many deeply held views into question, such as that an informed citizenry is the best safeguard of our liberties.⁸⁹ Acceptance of claim (a) should incline one to accept claim (b). Self-protection and economic activity are important, frequently performed life tasks, and seem no more complex than other activities that claim (a) assumes people are competent to pursue.

The three reasons given here together suggest that courts should reestablish a contributory negligence defense and be more reluctant than they now are to let juries speculate about the adequacy of warnings.⁹⁰

3. *The Test Applied*

To test the plausibility of the proposed reform, consider how it would resolve four typical cases. In case (a), a consumer purchases a Volkswagen Golf and is injured when, with no negligence on her part, the Golf crashes into a tree. She sues, claiming that had the car been composed of much heavier metal, she would not have been injured. Under the proposed rule—and current law—the consumer loses; she knew or should have

88. The existence of this commitment is being verified. The odds of plaintiffs winning jury verdicts, and winning larger awards in complex cases, are increasing. See M. PETERSON, CIVIL JURIES IN THE 1980s: TRENDS IN JURY TRIALS AND VERDICTS IN CALIFORNIA AND COOK COUNTY, ILLINOIS (Rand Report No. R-3466ICJ, 1987). Also, when other factors of the case are held constant, juries are more likely to find against wealthy, corporate defendants. See Wittman, *The Price of Negligence Under Differing Liability Rules*, 21 J.L. & ECON. 151, 152 n.3 (1986); Wittman, *The Behavior of Litigants, Juries and Professional Arbitrators in Civil Cases: An Empirical Study of Cooperative Justice and the Issue of "Deep Pockets"* (1986) (unpublished manuscript on file with author).

89. Cf. *Whitney v. California*, 274 U.S. 357, 372 (1927) (Brandeis, J., concurring) (free trade in ideas indispensable to preserving democratic government).

90. For the reasons given in Section II-C-4, *supra*, a firm's compliance with a statute or regulation on warnings should be exculpatory rather than evidence on the firm's behalf, as it is now.

known that Volkswagens are less crashworthy than Rolls Royces, and therefore assumed the risk.⁹¹

In case (b), a magic metal which existed when the Volkswagen was sold would have made the Volkswagen as safe in crashes as today's Rolls Royce, though the Volkswagen would have weighed no more than normal Volkswagens. The manufacturer did not use the magic metal because it would have added \$500 to the car's costs and cars made of magic metal are much more expensive to repaint and hammer out in the event of scrapes and dents. Under current law, the manufacturer would be liable only if Golfs with magic metal did better on the risk/benefit test than Golfs without it. Under the proposed test, the manufacturer would be liable unless it gave an adequate warning that informed consumers of the additional risk of not using the magic metal. The consumer did not assume the risk in this second case because, without such a warning, she was unaware of the full set of options provided by the market.

In case (a), consumers are as well informed as the firm about the design choice. They know that Rolls Royces are safer but more expensive than Volkswagens. Hence, the VW maker's design choice would be optimal, for it had to satisfy informed persons. In case (b), the consumer is not similarly informed. Ordinary people lack the information and expertise to make the technological choices involved in metal selection. Hence, the firm's design choice cannot be presumed to be optimal.⁹²

True strict liability is justified in case (b) for three reasons: (i) If use of the magic metal is optimal, given that the consumers behave nonnegligently, the firm will be induced to use it; (ii) If use of the metal is not cost justified, the price of Golfs nevertheless will more accurately reflect their accident costs, thereby better informing consumers of the risk of driving (just as a warning would); (iii) The administrative costs of trials would be reduced and their results made more predictable because the only issue would be the adequacy of the warning (if one were given). The law would not demand a complex risk/benefit test.⁹³

91. See *Dreisonstok v. Volkswagenwerk, A.G.*, 489 F.2d 1066 (4th Cir. 1974) (firm not liable for design of van that positioned driver in front of motor so that motor offered no protection in event of crash); *Seattle-First Nat'l Bank v. Trabert*, 86 Wash. 2d 145, 154, 542 P.2d 774 (1975) ("The purchaser of a Volkswagen cannot reasonably expect the same degree of safety as would the buyer of the much more expensive Cadillac.").

92. For similar reasons, the question whether cars are defectively designed when they lack airbags falls within case (a) rather than case (b). Consumers know that airbags exist, are safer than not using seat belts, and would increase the price of cars by a nontrivial amount. The failure of firms to use them thus seems a response to consumer preference.

93. Current legal doctrines often resolve case (b) against firms. The cases are more complex than they would be under the proposed reform, however. For example, *Dawson v. Chrysler Corp.*, 630 F.2d 950 (3rd Cir. 1980), *cert. denied*, 450 U.S. 959 (1981), affirmed a jury verdict against Chrysler because its cars lacked rigid side bars that would have better protected the driver in a sideways collision. *Id.* at 954. The bars would have added \$302 to the car's price and made it heavier and possibly more dangerous in a front-end collision. The outcome is problematic under current law since the evidence given at trial did not indicate whether cars with or without side bars did better on the risk/benefit test. The *Dawson* line of cases has been strongly criticized on these grounds. See J. HENDER-

In case (c), magic metal is invented after the Golf is sold. A majority of jurisdictions today, applying the state-of-the-art defense, would exculpate the manufacturer on the ground that consumers could not expect products to contain features whose use was infeasible when the products were made.⁹⁴ Scholars criticize this rule as creating insufficient incentives for firms to develop safety improvements.⁹⁵ Two alternative rules may be considered. One rule would hold that liability depends on the effectiveness of a firm's research program. If a firm had an optimal safety research program and did not discover a safety improvement, then it would not be held liable. Such a program would require a firm to equate the marginal costs of safety research with its marginal gains. These gains would be the increased profits resulting from lowering expected accident costs through improved safety information.⁹⁶ The other alternative would be to hold the firm liable absolutely, that is, liable regardless of when knowledge of the safety improvement could have been learned.

If courts can accurately set the due care research standard required by the first rule, the two alternative rules create identical and optimal incentives for firms to do safety research. Should firms be held liable regardless of how much research they do, as under the second rule, they will conduct research until the marginal costs of further research equal the marginal gains from increased safety information. The first rule ideally sets the due care standard at the point at which the marginal costs and gains of further research are equal. Hence, if firms believe that the due care standard will be accurately established and applied, they will do as much, and no more, research under it as under a rule of absolute liability. Equating the marginal costs and benefits of research programs, however, seems more difficult than an ordinary negligence question. If some inaccuracy in courts' decisions on this matter is assumed, choosing between absolute liability and negligence as a replacement for the current state-of-the-art rule is difficult. On the one hand, absolute liability is easy to administer and creates the correct private incentives for research. On the other hand, absolute liability creates considerable uncertainty; firms cannot predict their future liability. The incentives created under this standard also may not be socially optimal. This is because research is a public good⁹⁷ that firms doing the privately optimal amount of research are likely to underprovide. Thus, inaccuracy in the judicial application of a negligence rule would be

SON & A. TWERSKI, *supra* note 2, at 572-73, 580-85. This criticism is misdirected since the firm should be held liable. The solution proposed here does this more simply, however.

94. See, e.g., *Bruce v. Martin-Marietta Corp.*, 544 F.2d 442, 447 (10th Cir. 1976).

95. See Calabresi & Klevorik, *Four Tests for Liability in Torts*, 14 J. LEGAL STUD. 585 (1985).

96. The nature of an optimal research program is described in Schwartz, *Products Liability, Corporate Structure, and Bankruptcy: Toxic Substances and the Remote Risk Relationship*, 14 J. LEGAL STUD. 689, 695-703 (1985).

97. In economics, a public good is one whose benefits are indivisible and widely dispersed. Firms cannot subdivide such a good so as to sell it only to those benefiting from it, causing it to be underprovided by private firms. See P. SAMUELSON & W. NORDHAUS, *supra* note 44, at 48-49, 713.

desirable if it induced firms to research somewhat excessively. There is no simple way to resolve these competing considerations, but the probable likelihood of overcompliance with a negligence rule argues for that rule's desirability.

In order to analyze the effect of a legal rule's uncertain application on a firm's incentive to comply with that rule, make three assumptions: (i) The summary statistic for compliance is the amount the firm invests in safety research, where y is how much firm i invests and y^* is the optimal amount; (ii) There is a positive probability that a firm will be held negligent if it spends $y > y^*$, and a positive probability that it will be held non-negligent if it spends $y < y^*$; the size of the variance around y^* is a measure of the uncertainty a firm faces due to courts' inability always to identify the due care standard accurately; (iii) The likelihood that a firm will be found liable varies inversely with y , so that overcompliance can reduce the likelihood of being found liable.⁹⁸

Given these assumptions, a firm's compliance incentive is a function of two factors: the size of the variance, or the degree of uncertainty, and the expected cost of damages if the firm takes slightly less or slightly more

98. The analysis above respecting uncertainty and noncompliance draws heavily from Calfee & Craswell, *Some Effects of Uncertainty on Compliance with Legal Standards*, 70 VA. L. REV. 965 (1984); Craswell & Calfee, *Deterrence and Uncertain Legal Standards*, 2 J.L. ECON. & ORGANIZATION 279 (1986); H. Johnson, J. Kolstad & T. Ulen, *Ex Ante Regulation and Ex Post Liability: Substitute or Complement?* (1987) (unpublished manuscript). The textual argument may be clarified by a picture:

The horizontal axis is the amount the firm invests in safety research; the vertical axis represents the various probabilities that a firm will be held liable when it spends particular amounts. The dashed line distribution represents substantially greater uncertainty for a firm—the variance is greater—than the solid line distribution. For example, a move to the right—more compliance—would reduce the likelihood of being found liable by less were the dashed distribution to describe the firm's view of its prospects than were the solid line distribution to describe these prospects. Analysts in this literature make two further assumptions: (iv) the probability density function is single peaked and symmetric—these requirements are satisfied by the bell-shaped normal distributions drawn in the figure; (v) firms are centered at the optimal level y^* —that is, they believe courts are able to locate the correct due care standard but in actual cases can overshoot, or undershoot, the mark.

care than required by the due care standard. Two offsetting effects are relevant to the first factor. First, any uncertainty in application of a legal standard creates an incentive for undercompliance, for when the probability of a sanction being applied for bad behavior is less than one, there is a tendency to disobey. Second, the likelihood of being found liable varies inversely with the amount of care taken. When there is relatively little uncertainty in the application of the legal rule, so that even a little overcompliance greatly reduces the probability of adverse judgments, the latter effect dominates the former. But when there is substantial uncertainty, such that a little overcompliance will not affect the likelihood of liability significantly, the former effect dominates.

To consider the second factor, one should note that the costs to a firm of doing research into safety are not affected by the amount of accident costs that research avoids; research costs are just inputs to the firm that are purchased in markets. If research costs are held constant, then, the larger the expected accident costs when a firm's investment in safety is close to the due care standard, the more valuable to a firm will be small reductions in the probability of being found liable; hence, the greater will be the firm's incentive to do research—to appear to comply—so as to reduce this probability. Therefore, overcompliance should occur when expected accident costs are high.

Using these factors to generate predictions in actual cases is an uncertain enterprise because there is no obvious way to know when a variance is “large” or expected accident costs are “high” relative to the firm's other decision variables. Speculation suggests that in the design area overcompliance is more likely than undercompliance. Consider the manufacture of automobiles. The current set of probably useful safety improvements for cars appears small—airbags and shock absorbing bumpers, for example—and the costs of safety research are relatively well known. Thus, in a suit against a car maker for failing to use a subsequently perfected device, the trier of fact probably could reconstruct the optimal research program with a rough degree of accuracy. The variance, or degree of uncertainty, firms face thus seems small, which should incline firms to invest excessively in safety research. High accident costs also push firms in the direction of overcompliance. When a design, rather than a single item, is found defective, expected liability costs are likely to be high, for every item produced may lead to a lawsuit. To the extent that cars are paradigmatic, then, firms will overcomply with a rule holding them liable only if they failed to research safety optimally. In contrast to the negligence standard just examined, the absolute liability rule punishes firms whenever a useful safety device is invented subsequent to manufacture. Since liability costs for design defects can be quite high, the absolute liability rule would create substantial uncertainty costs and result in serious insurability problems.

To summarize this analysis of case (c), the manufacturer should be strictly liable for failing to make cars with magic metal only if the existence of the metal would have been revealed by an optimal safety research program. Such a result will create either correct or excessive incentives for firms to do research; either outcome is acceptable. It also has relatively low uncertainty costs. The current state-of-the-art rule probably produces insufficient safety incentives, while an absolute liability rule generates excessive uncertainty costs.

Case (d) is case (b) with multiple actors: The Golf lacked the magic metal, though the firm knew of it, but the consumer was injured when her car shot off an insufficiently banked curve. If the consumer was nonnegligent, she should not bear the loss because she is presumably uninformed and both injurers, the firm and the relevant county, could reduce the likelihood of such losses by warning or redesign. Under current law, the plaintiff could sue either injurer and collect her full loss from one of them, or could request that the loss be apportioned between the two injurers. Whether a particular injurer who is sued for the full loss can collect any part of the judgment from the other is a difficult legal question. There was no contribution among joint tortfeasors at common law, but this rule has been altered by statute in most states. Courts today vary in allowing an injurer to obtain contribution (or indemnity) under these statutes.⁹⁹

The appropriate rule for apportioning the loss would be to assess the injurers on a comparative basis. One should realize that the county responsible for roads in this illustration is subject to a negligence rule. Under the strict liability contributory negligence solution proposed above, the manufacturer has an incentive to invest in safety until the marginal cost of doing so equals the marginal gain—which the firm will likely calculate not as benefits to consumers but as the reduction in its expected accident costs resulting from additional expenditures on safety. A court can treat the failure of a firm to optimize safety according to this rule as negligence, in the spirit of the Learned Hand test, because it can retrieve the variables the firm used in its calculations. Since both actors in this illustration can be subject to a negligence rule and comparative negligence is efficient,¹⁰⁰ a satisfactory rule would allow the consumer to sue either the county or Volkswagen, with comparative negligence governing any claim between the nonconsumer parties.

The proposed solution of strict liability for all design harms, with contributory negligence and assumption of risk defenses, would replace cur-

99. For a description of the law of contribution and indemnity, see W. PROSSER & W. KEETON, *supra* note 1, §§ 50–51. Compare *Safeway Stores, Inc. v. Nest-Kart*, 21 Cal. 3d 322, 579 P.2d 441, 146 Cal. Rptr. 550 (1978) (allowed contribution) with *General Motors Corp. v. Simmons*, 558 S.W.2d 855 (Tex. 1977) (refused contribution).

100. See authorities cited *supra* note 80; Landes & Posner, *Joint and Multiple Tortfeasors: An Economic Analysis*, 9 J. LEGAL STUD. 517 (1980).

rent efforts to specify the firm's quality obligation through adjudication with a rule that holds a firm liable whenever its design causes harm. This new rule seems faithful to the law's safety and compensation goals, resolves most cases relatively easily, and should make the law less arbitrary in its application.

B. *Damage Issues*

1. *Pecuniary Loss*

The consumer sovereignty norm offers two justifications for holding firms strictly liable for consumers' pecuniary losses. First, well-informed consumers would insure fully against these losses, as shown in Section I-B-1, but consumers who underestimate the risk that losses will be incurred will not do so. Consequently, strict liability for pecuniary harm only requires firms to supply an insurance term that the firms would have supplied had the market been working well.

Second, strict liability for pecuniary loss creates appropriate incentives for safety. Courts cannot decide themselves how products should be made, as Sections II-C and III-A showed, but they can impose strict liability for pecuniary harm. This is the correct solution because such liability induces firms to make all safety investments whose cost falls below consumers' willingness to pay. To see why, recall that pecuniary losses are "replaceable": A \$500 wage loss is fully replaced by an insurance award of \$500. When losses are replaceable, the value people attach *ex ante* to the prospect of being injured is solely a function of the monetary cost of the loss and the probability of incurring it. This value is not affected by a consumer's income level.¹⁰¹ This fact is important because, when safety improvements are at issue, the consumer's choice is not between a dangerous or safe product, but between products that are relatively safe and relatively less so. The informed consumer asks: How much are marginal reductions in the probability of harm worth? Because consumers value pecuniary losses at their full monetary magnitudes, they value all such marginal reductions in the probability of harm equally: A consumer will pay up to \$10 for a one percent reduction in the probability of an expected \$1,000 pecuniary loss, whether the reduction is made from a probability of harm level of .5 or of .1. Therefore, to hold a firm strictly liable for the full \$1,000 loss will create the correct incentives for safety (as long as the firm can predict accident costs accurately). The firm will make all marginal reductions in the probability of harm that cost less than \$10, and will charge the consumer for the expected value of the remaining risks. This is the appropriate insurance premium. The traditional belief

101. Section III-B-2 discusses the complexities that arise when the value people place on losses is a function of their income, as is the case with nonpecuniary harms.

that strict liability simultaneously serves the law's compensation and safety goals thus seems borne out by modern theory, at least with respect to pecuniary harms.¹⁰²

This conclusion is complicated, however, because the problems of moral hazard,¹⁰³ adverse selection and cross-subsidization that accompany manufacturer-supplied insurance make strict liability seem less desirable.¹⁰⁴ Insurance companies respond to moral hazard and adverse selection in several ways. First, they sell policies with deductibles. A deductible imposes part of a loss on the insured, thereby creating an incentive for the insured to exercise caution. This reduces the moral hazard problem. Deductibles also reduce the adverse selection problem. A purchaser who agrees to a large deductible is telling her insurance company, in a credible way, that she believes she is unlikely to incur frequent losses. The insurance company then is more willing to insure her because it can plausibly believe she is a low risk. Similarly, the common practice of purchasing income maintenance coverage for a period substantially shorter than a person's working life both creates an incentive for an insured not to malingering and signals insurance companies that the insured prefers work to subsidized leisure. Hence, the purchase of limited coverage responds to moral hazard and adverse selection problems. Finally, insurance companies can key rates to observable traits of insureds that correlate negatively with the making of claims.¹⁰⁵

Requiring manufacturers to supply insurance through strict liability is problematic, because third party insurance responds poorly to moral hazard and adverse selection problems. Manufacturers who are compelled to sell insurance do not bargain with consumers, or even know who they are, and so cannot sell deductibles or otherwise tailor loss coverage to individual consumer wants or traits. Rather, they must sell the same "full protection" policy to every purchaser. The cost to consumers of insuring with manufacturers thus is higher than the cost of insuring with insurance companies.

The third party insurance that strict liability compels also produces cross-subsidization. For example, suppose that person A earns \$1,000 a month and would like to purchase coverage against a product-caused loss

102. See *supra* text accompanying note 26.

103. A moral hazard problem arises because an insured sometimes can influence the probability of an accident by taking care, but exercising caution is costly. After insurance is purchased, the insured derives no pecuniary benefit from care. He is fully covered whether he is careful or not and therefore may be careless.

104. Much of the following analysis derives from Priest, *The Current Insurance Crisis and Modern Tort Law*, 96 YALE L.J. 1521 (1987), and Epstein, *Products Liability as an Insurance Market*, 14 J. LEGAL STUD. 645 (1985).

105. For example, companies charge lower rates to safe drivers. If insurance companies are precluded from using deductibles, limiting coverage, or keying rates to observable claim related factors, they will face serious moral hazard and adverse selection problems. Their response to these problems is predictable: They will refuse to sell coverage or raise rates.

of one year's income, the probability of which is .01. The risk to this person, and hence his premium, is \$120 per year. Person *B* buys the same product and also wants one year's coverage, but she earns \$2,000 a month. Hence, her risk and premium is \$240. A private insurance company would sell policies to these two people and collect a premium of \$360, \$120 from *A* and \$240 from *B*. A manufacturer, given these facts, also would collect a total premium of \$360 but, because it could not distinguish *A* from *B*, would charge each of them \$180 by adding this amount to the product price. As a consequence, person *A* pays an amount equal to the cost of serving him, \$120, plus a subsidy of \$60, so that person *B* can buy insurance for \$60 less than the social cost of serving her. Since *A* earns less than *B*, and thus is likely to be poorer, the cross-subsidization seems inequitable; it redistributes wealth from the poor to the rich. It is also inefficient, since *B* is offered a product at less than its social cost, while *A* is offered a product at more than its social cost. Because private first party insurance has equity and efficiency advantages over third party insurance, strict liability, which requires firms to bear the pecuniary loss risk as third party insurers, seems misconceived.

These arguments do not overcome the case for strict liability when the full implications of consumer risk misperceptions are considered. If firms disclaimed liability for pecuniary loss, optimistic consumers might buy an insufficient amount of first party insurance. The insurance they did buy would cover the vicissitudes of life: losses from product defects, accidents in the home, and criminal assault. The premium would reflect all of these causes but would not identify their separate contributions. Therefore, consumers could not know the value of product risks by observing either the insurance or the product prices quoted to them. Instead, in making purchases they would simply infer this value from what they generally know. By assumption, their inferences would be incorrect. Consequently, consumers might buy too many unsafe products and consumer demand would not give firms the appropriate incentives to invest in safety. The costs of freedom of contract, in the form of undercompensation and possibly reduced deterrence, thus could exceed the gains, in the form of more efficient insurance policies.

In addition, a sensible strict liability system does not ignore moral hazard and adverse selection concerns. If the law were to enforce a contributory negligence defense, consumers would face incentives to take care that would counterbalance the disincentives created by third party insurance. Thus, when consumers are imperfectly informed, the claim that the deficiencies of third party insurance justify abandoning strict liability is unpersuasive.¹⁰⁶

106. Also, the advantages of first party insurance markets should not be overstated. Group insurance, which covers many persons, involves little experience rating and so produces nontrivial moral

Nonetheless, the deficiencies of third party insurance through strict liability are troubling. They could be partially avoided, and the advantages of strict liability retained, by adopting a rule that requires firms whose products could cause harm to quote two prices to consumers—a “full” price that includes the cost of insurance, and a “reduced” price that excludes this cost. Under the proposed rule, a consumer who paid the “full” price would be entitled to sue the firm in strict liability for pecuniary loss. A consumer who paid the “reduced” price would not. The consumer, however, could not obtain a “reduced” price unless he gave the seller a certificate, obtained from the consumer’s insurance company, establishing that the consumer was insured against pecuniary harm.¹⁰⁷

This reform would have two advantages. First, it would create increased awareness of product risks. A consumer who was not insured would know how much the product’s price was increased by a strict liability insurance policy. An insured consumer would know substantially more about how dangerous products are. Because consumers would be better informed, firms would face more accurate demand curves and so be more likely to invest optimally in safety. Second, the scheme would permit consumers to benefit from the efficiencies and equities of first party insurance; consumers could opt out of strict liability upon proof that they were privately insured.

This solution is not fanciful. Existing markets sometimes provide two price schemes, in the form of standard warranties and optional extended service contracts.¹⁰⁸ Nevertheless, the solution may have serious shortcomings. One concern is that bad risks may find it difficult to purchase private insurance. If so, an adverse selection problem will be created that could greatly increase product prices or render the proposed solution unworkable. The adverse selection problem may also distort the strict liability price signal. If only bad risks “insure” with manufacturers, the good risks who opt out will see a price difference between a product with strict liability and a product without it that reflects the high extreme and not

hazard and adverse selection problems. See Feldman, *Health Insurance in the United States: Is Market Failure Avoidable?*, 54 J. RISK & INS. 298 (1987).

107. The logic of this reform implies that consumers also should be able to opt out of strict liability if they are self-insured, but it seems unwise to allow consumers to do so. The reform’s effect would be vitiated if simple declarations by consumers that they were self-insured were given legal effect, for consumers would be tempted to lie to get lower prices. Thus, the law should require evidence of self-insurance. When self-insurance is claimed, the only credible evidence would be personal financial records. Insisting on such evidence is objectionable for two reasons: it is not easy to specify what records would suffice, and privacy values could be contravened if people had to reveal substantial personal data just to make purchases. It thus seems preferable to require proof of market insurance. This issue seems unimportant, however, because consumers who are affluent enough to self-insure commonly also purchase market insurance against risks to life and health.

108. The solution is related to the idea that it is appropriate to use the amount for which a person insured herself when buying general accident insurance as the sum that would compensate her for tortious harm. See Levmore, *Self-Assessed Valuation Systems For Tort and Other Law*, 68 VA. L. REV. 771, 810–19 (1982).

the mean risk of harm. The good risks then may believe that the product is more dangerous than it actually is, and so purchase less of it than they should, creating excessive incentives for firms to invest in safety.

Another problem arises from the reform's purpose of ensuring that the compensation goal is adequately pursued. Given this purpose, how much private insurance must a consumer have to opt out of strict liability? Because consumers and possible insurance packages are diverse, this question may be difficult to answer. Finally, developing and policing a certificate opting-out scheme is a complex activity. All of these difficulties may be resolvable, but they obviously imply that the scheme requires further study. This study should be undertaken because the scheme could help resolve a problem—that given the nature of insurance markets, strict liability is too expensive—which has never been successfully addressed.

2. *Nonpecuniary Loss*

Strict liability for nonpecuniary harm is questionable even if imperfect information is assumed, because strict liability requires consumers to purchase more insurance and more safety than their better informed selves would want. The former defect is discussed in Section I-B-1. The latter defect exists because the willingness to pay problem introduced in Section I-B-2 is difficult to solve when nonpecuniary harm is at issue. Nonpecuniary harms are not replaceable by insurance payments or damage judgments; rather, these transfers are used to purchase substitutes that make up for or assuage the pain of accidents.¹⁰⁹ Because substitutes rather than replacements are at issue, the value people attach to the risk of incurring nonpecuniary harm is a function of people's income. This follows from the diminishing marginal utility of money theory, which holds that a poor person would miss the marginal dollars required to purchase substitutes more than a rich person, and so the former would pay more to avoid having to purchase substitutes—that is, pay more to reduce the risk of harm. An important implication of this analysis is that risk values are a function of risk levels themselves. This is because risks are current costs to people; consequently, people are poorer when they face high risks than when they face low risks. Therefore, people will pay more to reduce the odds of harm when risks are high. Since current strict liability law requires full compensation for harm, regardless of the risk level, it is insensitive to variations in people's willingness to pay and so induces firms to invest excessively in safety.

An illustration will clarify this point. Let a firm make a product that is defective .1 of the time and causes only nonpecuniary harm. The firm could reduce the probability of harm in .01 increments at a successive cost

109. See *supra* Section I-B-1.

of \$10 for the first reduction, \$11 for the second, \$12 for the third, and so forth. If consumer *X* is injured, suppose, a jury would value her nonpecuniary harm at \$1,200, for which the firm would be strictly liable. If the firm anticipated this liability, it would reduce the product's propensity to injure by .03 and charge consumer *X* \$33; each .01 reduction in the odds of incurring a \$1,200 loss is worth \$12 to the firm, so it will make all such reductions whose cost falls below or equals \$12. Suppose, however, that consumer *X* values marginal losses from incurring nonpecuniary harm at \$1,100 when the risk level is .1, \$950 when it is .09, and so forth. These values for risk imply that consumer *X* would be willing to pay \$11 for the first .01 reduction in the probability of incurring nonpecuniary harm, \$9.50 for the second .01 reduction, and less for the third.¹¹⁰ If consumer *X*'s preferences should control, the firm should make only the first risk reduction, whose cost is less than consumer *X* is willing to spend on safety. Strict liability thus compels consumers to pay more for safety—\$33 in this illustration—than consumers believe safety is worth to them.¹¹¹

110. Recall that the value of a risk is the product of its likelihood and its cost. Thus, if a consumer attaches a value of \$1,100 to nonpecuniary harm at a risk level of .10, she would pay up to .01 times \$1,100, or \$11, for a .01 reduction in the probability of incurring the harm.

111. This analysis may be further clarified by a diagram:

The vertical axis represents the consumer's wealth, the horizontal axis the probability of harm. The line $W(p)$ is an indifference curve, reflecting all wealth/probability combinations among which the consumer is indifferent. For example, the consumer is indifferent between having the wealth endowment $W=A$ and facing the probability $p=.9$, and having the pair $W=B$; $p=.7$. The curve rises to show that as the probability of an accident increases, the consumer needs more wealth to be indifferent between higher and lower probabilities of harm. The curve also is convex, which means that the consumer is willing to give up less wealth for reductions in the probability of harm when that probability is low than when it is high. Convexity is implied by the diminishing marginal utility of money theory. The analytical conclusion that people value risks less when they are low has empirical support. A large British survey ($n=1,103$ persons) found that people state that they will pay more to reduce risks when the probability of harm is high than when it is low. See Jones-Lee, Hammerton & Phillips, *The Value of Safety: Results of a National Sample Survey*, 95 *ECON. J.* 49, 53-57 (1985).

Difficulties arise in implementing this analysis. A firm should be held liable for nonpecuniary harm if it fails to make safety improvements whose cost is below a consumer's willingness to pay, but the rate at which individuals will substitute money for risk varies. These individual marginal rates of substitution cannot easily be reconstructed *ex post*. A decisionmaker could determine mean rates of substitution—such as that the average person will pay \$300 to move from $p=.2$ to $p=.19$ but only \$8.00 to move from .03 to .02—by using survey research. Firms could be held liable if they failed to make the safety investments their own costs and these mean rates implied. A jury is unlikely to be able to act in this fashion, however, because litigants will not provide it with the requisite data. Courts also are reluctant to set intermediate levels for damage recoveries. Hence, courts can either require full compensation for nonpecuniary harm, which juries perhaps can assess, or require no compensation at all. The former choice produces excessive safety and excessive insurance. The latter probably produces insufficient safety, though the insurance level will be correct. There is no obvious choice between these options.

This problem in setting appropriate nonpecuniary damage awards arises because the common law has too few policy instruments; courts can only award damages or deny them. Administrative intervention would provide another policy instrument. The state could exclude common law liability for pain and suffering losses, but impose tort fines on firms. Economists sometimes suggest this solution but have not considered how it would work for products liability.¹¹² An agency, in theory at least, could ascertain mean consumer marginal rates of substitution between money and risk by survey research and then fine firms that failed to make the safety investments implied by these substitution rates and the firms' own costs.

This reform has two virtues. First, the prospect of fines would create incentives for firms to invest in safety. Second, since the fines would be set by statute or regulation, manufacturers' exposure would be more predictable. A weakness of this reform is that it forces unwanted insurance on consumers by causing higher prices. This effect could be mitigated by rebating collected fines to consumer purchasers. Tort fines thus could achieve some accident cost reduction without imposing excessively sub-optimal contracts on consumers.¹¹³ This reform, like others suggested in

(automobile safety). Similar survey results were obtained in Smith & Desvousges, *An Empirical Analysis of the Economic Value of Risk Changes*, 95 J. POL. ECON. 89, 109–10 (1987) (hazardous wastes).

112. Potential uses for tort fines are described in S. SHAPELL, *supra* note 2, at 233–35. The tort fine option perhaps was first noted by Calabresi. See G. CALABRESI, *supra* note 41, at 119–28, 270 n.5. The text discusses only pain and suffering, but the analysis also applies to other nonpecuniary harms such as mental distress.

113. A cap on the recovery of nonpecuniary losses is frequently proposed. Some states have “capped” noneconomic loss generally, or, more commonly, limited the recovery of nonpecuniary damages in medical malpractice actions. See *supra* note 1. A cap is a rough compromise between the

this Article, is proposed for serious study rather than advocated strongly. The administrative difficulties in implementing the reform are significant; creating a fine schedule and managing a rebate scheme are complex activities.¹¹⁴ Nevertheless, the reform appears to be the best means of harmonizing the law's compensation and safety goals in the context of non-pecuniary loss.

Courts cannot institute a system of tort fines, but nevertheless should deny strict liability for nonpecuniary harm for three reasons.¹¹⁵ First, denying liability will result in consumers purchasing the appropriate amount of insurance. Second, the risk of nonpecuniary harm is difficult for firms to predict and insure against. Consumers' ability to seek compensation for nonpecuniary harm also causes firms to contest lawsuits they might otherwise settle. Thus, the uncertainty and administrative costs of the tort system will be substantially lower if strict liability for this aspect of harm is denied. Third, as shown in Section II-B-1, there is only weak evidence that consumer risk misperceptions actually justify strict liability. For the reasons given there, uncertainty as to whether strict liability is necessary should be resolved by refraining from imposing the risk of incurring nonpecuniary harm on firms.¹¹⁶ The best solution is for courts to impose strict liability only for pecuniary harm and for legislatures to create a system of tort fines.¹¹⁷

conflicting goals of accident cost reduction and provision of adequate compensation. The tort fine alternative is preferable because it approximately achieves these goals rather than partially sacrifices both of them, as caps do.

114. There is no general method for estimating the value of changes in the probabilities of harm as a function of the attributes of a risky event. Thus, marginal rates of substitution may have to be discovered risk by risk, which would be a tedious process. See Smith, *Benefit-Cost Analysis and Risk Assessment*, 4 ADVANCES IN APPLIED MICROECONOMICS, 19, 42-43 (1986).

115. Denying tort recoveries for pain and suffering would have a significant impact. Recent data show that pain and suffering damages comprise from 30% to 57% of all awards in which payment for bodily injury is received, depending on the type of injury. Also, when any award for pain and suffering is made, pain and suffering damages constitute approximately 67% of the total recovered. See W. Viscusi, *Pain and Suffering in Product Liability Cases: Systematic Compensation or Capricious Awards* (1987) (unpublished manuscript on file with author).

116. An additional, very speculative point is that the magnitude of pain and suffering losses may be endogenous to the liability system. To deny their recovery is to tell people that suffering is to be borne with courage and overcome. To permit recovery is to tell them that suffering is so awful that only large sums of money can assuage pain. There may be less suffering under the former legal regime, and the attitude it encourages may be more adaptive to life. Hence, the denial of recovery for pain and suffering losses may actually reduce their magnitude. The possible pernicious effect on people's attitudes that could be caused by the legal system's grant of monetary damages for pain and suffering apparently makes these damages objectionable on Marxist grounds as well. Richard Abel used a Marxist perspective to argue that damages for pain and suffering should be abolished because the awarding of them "commodifies" suffering, thereby reinforcing the bourgeois notion that all aspects of experience are monetizable. In his words, "damages for intangible injury dehumanize, substituting money for compassion, arousing jealousy rather than expressing sympathy, and contributing to a culture that views experience and love as commodities." Abel, *A Critique of Tort Law*, 8 BRIT. J. LAW & SOC. 199, 210 (1981); see also *id.* at 207.

117. An objection to this conclusion deserves mention. Pain and suffering recoveries may be argued to have no direct compensation or safety function, but instead to serve to require defendants to pay plaintiffs' legal fees. Allegedly, these payments advance the law's goals indirectly: The payment of plaintiffs' legal fees helps achieve the compensation goal. Although plaintiffs can recover all pecuniary

C. *Punitive Damages*

Punitive damages are awarded in products liability cases to punish those who fail the risk/benefit test or violate the duty to warn.¹¹⁸ Under traditional tort law, such delicts would have to be egregious to justify a punitive damages award. This rule has been relaxed in recent years. Punitive damage awards now are commonly sought in products liability cases and sometimes are granted for seemingly ordinary transgressions.¹¹⁹

It is not necessary to relax the traditional rule to achieve safe products.¹²⁰ Design and warning liability under current law is a version of negligence. Firms are not liable unless their conduct falls below the legal standard. Liability in negligence has a peculiar feature: Firms that spend less on safety or warnings than the legal standard requires bear all accident costs, while firms that spend the appropriate amount bear no losses. The legal sanction, that is, does not vary with the degree of undercompliance; firms are fully liable whether they undercomply by a dollar or by a million dollars. Consequently, firms never voluntarily undercomply by only a small amount. Firms can violate their design or warning obligations accidentally or deliberately, but firms that deliberate will un-

losses, they must pay lawyers; the pain and suffering damage component permits such payments while ensuring that full compensation is received. Also, that consumers can fully recover pecuniary losses induces them to sue when they otherwise would not. Consequently, firms are faced with all of the costs they cause. This latter argument presupposes that without recoveries for pain and suffering, the law would be underenforced.

These justifications for the recovery of pain and suffering losses are unpersuasive. The common solution to the problem of undercompensation or underenforcement is to provide counsel fees to the winner in a law suit. There is no reason to suppose that the imprecise solution of a pain and suffering recovery is superior to an explicit statutory award of legal fees. Moreover, because firms reflect anticipated pain and suffering judgments in prices, consumers now are compelled to enter a "market" for prepaid legal services. Although markets for a few forms of prepaid legal services now exist, the apparent scarcity of such markets (when no impediments to the formation of these markets appear to exist) suggests that such a legally imposed market may contravene the consumer sovereignty norm.

There also is no reason to suppose that products liability law would be underenforced if the incentive to sue is reduced in some cases. Current analysis holds that some tort rules may be underenforced and others overenforced under any fee system because there always is a divergence between the private gain and the social gain from bringing suit. Thus, the actual effect of a change in the availability of legal fees is difficult to predict. See Polinsky & Rubinfeld, *The Welfare Implications of Costly Litigation for the Level of Liability*, 17 J. LEGAL STUD. 151 (1988).

118. See *Gillham v. Admiral Corp.*, 523 F.2d 102 (6th Cir. 1975), *cert. denied*, 424 U.S. 913 (1976) (design defect); *Neal v. Carey Canadian Mines, Ltd.*, 548 F. Supp. 357 (E.D. Pa. 1982) (duty to warn).

119. See Ausness, *Retribution and Deterrence: The Role of Punitive Damages in Products Liability Litigation*, 74 KY. L.J. 1, 14-38 (1985-86). Direct evidence from studies of jury verdicts in particular jurisdictions shows that while punitive damage awards generally are rising, "[t]he frequency of punitive awards in personal injury cases has changed little over the 25-year period of the study, although there has been some recent increase." THE INSTITUTE FOR CIVIL JUSTICE, RAND CORP. PUNITIVE DAMAGES . . . HOW MUCH AND TO WHOM: A SUMMARY OF RESEARCH RESULTS 2 (1987). On the other hand, "[e]xtraordinarily large awards . . . have ballooned in size in all types of cases. . . ." *Id.* at 3. Evidence similar to that of the RAND Study is reported in W. LANDES & R. POSNER, *supra* note 2, at 302-07.

120. The analysis in this section draws heavily from Cooter, *Economic Analysis of Punitive Damages*, 56 S. CAL. L. REV. 79 (1982); and Ellis, *Fairness and Efficiency in the Law of Punitive Damages*, 56 S. CAL. L. REV. 1 (1982). A helpful review of the cases is set out in Ausness, *supra* note 119.

dercomply by a lot because it is counterproductive to undercomply by a little. This analysis suggests that a manufacturer should be subject to punitive damages only if it recklessly or willfully disregarded safety. To act in this fashion is to undercomply by a lot. If the evidence fails to show a disregard for safety and the manufacturer's design or warning choice is at all plausible, punitive damages are unnecessary.¹²¹

Punitive damages are sometimes suggested as a response to under-enforcement of the law or to other forms of uncertainty in the law's application that may reduce a firm's incentive to behave lawfully.¹²² Yet it is difficult to justify punitive damages in products liability cases on these grounds. There is no reason to believe that products liability law generally is underenforced. Further, as Section III-A-3 showed, firms are often likely to respond to uncertainty in the application of laws by overcomplying. In these cases, the appropriate legal response is not to increase damages but to reduce them. Since it is hard to determine precisely when overcompliance is a serious problem, the best rule is to restrict punitive damage awards to outrageous cases.

IV. CONCLUSION: REFORM AND THE PRODUCTS LIABILITY CRISIS

Modern products liability law substitutes tort regulation of defective product problems for the contract regulation of the past on the ground that consumers are imperfectly informed. This shift in the legal treatment of defective products is difficult to justify because the evidence that consumers misspecify risks in ways that disadvantage them is weak. Consequently, those who believe that private choice should be restrained only if good reasons have been established for doing so should strive to reverse the abandonment of contract for tort. Decisionmakers whose concern is to compensate victims unless there are good reasons for not doing so could justifiably reject this conclusion, since the evidence that consumers are well-informed is persuasive but not compelling. Even so, tort regulation of defective products could be much improved as measured against the contractual norm that the state should provide consumers with the sales contracts that they would choose if they were better informed. According to this norm, courts have made three major errors. First, they sometimes have responded to the presumed existence of imperfect information by directly regulating product quality in design defect cases. This regulation is unworkable, and should be replaced by a rule that holds firms liable

121. See Cooter, *supra* note 120, at 89-91. This argument assumes that the risk/benefit test continues to be used. If courts were to adopt the strict liability/contributory negligence solution urged in Section II-C for design defects, there would be little need for punitive damages to ensure legal compliance.

122. See, e.g., Owen, *Punitive Damages in Products Liability Litigation*, 74 MICH. L. REV. 1257, 1292-95 (1976) (punitive damages appropriate when manufacturer takes advantage of shortcomings of legal system and makes it inordinately costly for victim to assert his legal rights).

whenever their products cause harm. Second, courts have relaxed consumers' obligation to take care in the mistaken belief that meeting this obligation requires information that consumers lack. The law should restore consumers' obligation to be careful because consumers are competent to fulfill this obligation, and because holding firms liable unless consumers are careless will produce the degree of safety that well-informed consumers would prefer. Third, courts misconceive the relation between tort law's compensation and deterrence goals. Compensating consumers fully for pecuniary harm satisfies both of these goals, but compensating consumers for nonpecuniary harm does not; informed consumers choosing *ex ante* would refuse both the extra insurance and extra safety that strict liability for nonpecuniary harm now requires them to purchase. Hence, firms should be strictly liable only for pecuniary harm.

These and other reforms suggested in this Article are meant to improve private law solutions to the defective products problem. It may be illuminating to explore how these reforms respond to the products liability "crisis" the current system is alleged to have caused. The "crisis" has two facets. First, high insurance rates or the refusal of insurers to write coverage result in some products being withdrawn from the market, others not being introduced, and still others being sold at much increased prices.¹²³ Second, in some industries, such as drugs and chemicals, thousands of victims sue one or a few manufacturers, thereby imposing large burdens on courts and defendants. It is implausible to suppose that products in general are becoming less safe.¹²⁴ The current products liability doctrine for treating the accidents that do occur is among the other possible causes of the current crisis.

The insurance problem is partly attributable to the uncertainty created by current law. Given current doctrine, it is difficult to anticipate liability. Courts also seem unpredictably to expand existing doctrines and create new ones. The law also allows high judgments, which makes suing rational even when there is only a small chance that victims' harms resulted from violations of existing law. These suits increase the pressure on courts to change their doctrines, resulting in further uncertainty.

The proposals made in this Article would alleviate the products liability crisis to the extent that it results from current doctrines and their application. The proposals would reduce uncertainty in application of the law by lessening the unpredictability of design defect litigation (Section III-A), increasing consumers' obligation to comply with written warnings and in-

123. See Priest, *supra* note 104, at 1521-24 (1987); Trebilcock, *The Social Insurance-Deterrence Dilemma of Modern North American Tort Law: A Canadian Perspective on the Liability Crisis*, 24 SAN DIEGO L. REV. 929 (1987).

124. The data indicate that accident rates, including those from products, fall with increases in wealth, and so have declined in the last fifty years. See Viscusi, *Consumer Behavior and the Safety Effects of Product Safety Regulation*, 28 J.L. & ECON. 527, 531 (1985).

structions (Section III-A and B), and eliminating strict liability for nonpecuniary losses, substituting a system of tort fines (Section I and III-B-2). The proposals would allow consumers to opt out of strict liability for pecuniary harm if they are insured (Section III-B-1), and generally reduce the incentive of consumers to sue in doubtful cases. Finally, recognition that the case for strict liability is itself weak should help alleviate an important cause of uncertainty: the penchant of courts to create new legal obligations that firms cannot escape through warnings or contracts.¹²⁵ Judges should recognize the imprudence of driving further along what may be the wrong road.

125. See, e.g., *Beshada v. Johns-Manville Prods. Corp.*, 90 N.J. 191, 447 A.2d 539 (1982) (manufacturer liable for harm regardless of whether product's danger was foreseeable at time of manufacture).

Appendix: An Analytic Discussion of Design Defect Liability

Law and economics analysis considers two methods of regulating a firm's conduct: negligence and strict liability. Either is desirable when it would cause firms to maximize social welfare in connection with product use. The negligence rule, however, is inappropriate in the product design context. To see why, consider the typical way this rule is derived.¹²⁶ Let $H(q, x)$ be the expected monetary loss to a consumer from a product defect where q is output and x is the firm's care level. The firm's production costs are $C = C(q, x)$ and the consumer derives benefits $B(q)$ from use of the product. The social optimum is obtained by maximizing welfare $W(q, x) = B(q) - H(q, x) - C(q, x)$ over output and the firm's care level. This equation assumes that expenditures on safety influence welfare only as subtractions from gross welfare, the $B(q)$ term; consumer benefits from an activity are supposed to be independent of safety expenditures on that activity. This assumption is often innocuous but, as shown in Section II-C above, is not legitimate when applied to products because expenditures on product safety directly affect product benefits.

When safety and product benefits are related, the standard methodology, which entails differentiating the welfare equation with respect to q and then x to solve for the first order conditions, is not appropriate. In the latter differentiation, the $B(q)$ term is a constant and drops out, which implies that the appropriate level of investment in safety can be derived by considering only accident and accident avoidance costs. However, benefits must also be considered in the design defect context. Judges have responded to this need by creating a different negligence rule, the risk/benefit test, which incorporates consumer benefits directly into the welfare calculation. Doing this, however, requires juries to do cost/benefit analyses, which they are ill-equipped to perform. This is therefore an undesirable solution. Strict liability with a contributory negligence defense is optimal. To establish this result, treat firms and consumers as if they are playing a simple dynamic game.¹²⁷ A firm's strategy is to take care (C)—invest optimally in cost reduction—or to be negligent (N). A consumer has the same choice. Losses are L . A firm's cost of care is a where a^* is optimal. A consumer's cost of care is b where b^* is optimal when the firm takes care and bn^* is optimal when it does not. Because what is optimal for consumers may depend on what is optimal for firms, $b^* < bn^*$ is possible (consumers may have to be more careful when firms are careless). The probability that a product will be defective is p , with p^* the probability if

126. A good example is found in the important article, Shavell, *Strict Liability Versus Negligence*, 9 J. LEGAL STUD. 1, 10-11, 13 (1980). See also W. LANDES & R. POSNER, *supra* note 2, at 278-80.

127. The theory of dynamic games is helpfully reviewed in Sutton, *Non-Cooperative Bargaining Theory: An Introduction*, 52 REV. ECON. STUD. 709 (1986); Fudenberg & Tirole, *Noncooperative Game Theory for Industrial Organization: An Introduction and Overview*, in D. SCHMALENSEE & R. WILLIG, *HANDBOOK OF INDUSTRIAL ORGANIZATION* (forthcoming)).

the firm takes care: $p > p^*$. If the firm is referred to as actor *I*, because it moves first by making the product, and the consumer is actor *II*, there are four accident probabilities:

- (i) $I(C); II(C) = p^* - \Delta p^*$
- (ii) $I(C); II(N) = p^*$
- (iii) $I(N); II(C) = p - \Delta p$
- (iv) $I(N); II(N) = p$.

Consumer care is taken to be a reduction in the likelihood that a defect will cause harm ($p^* - \Delta p^*$, for example). Suppose it is optimal for both parties to take some care. Then optimality implies that $a^* + b^* + (p^* - \Delta p^*)L < a + b + pL$, and so forth. There are four payoffs to consider (the firm's payoff is given first):

- (i) $I(C); II(C) = a^* + (p^* - \Delta p^*)L; b^*$
- (ii) $I(C); II(N) = (a^*); p^*L$
- (iii) $I(N); II(C) = a + (p - \Delta p)L; bn^*$
- (iv) $I(N); II(N) = a; pL$.

These payoffs reflect the rule that is assumed to govern, that is, strict liability with contributory negligence.

The game can be drawn as (with the firm's payoff on top):

Here, $I(C); II(C)$ is the unique Nash equilibrium. To see why, let *I* play *C*. Then *II*, the consumer, will also play *C*. A consumer is contributorily negligent when she fails to take cost-justified steps to reduce accident costs; that is, *II* is negligent if $\Delta p^*L > b^*$. This implies that $p^*L > b^*$. Hence, a consumer will play *C*, thereby incurring $b^* < p^*L$. Next let *I* play *N*. By the same logic, $bn^* < pL$ so the consumer will play *C* also. When the consumer will play *C* whatever the firm does, the firm's best

response will be to play C if $a^* + (p^* - \Delta p^*)L < a + (p - \Delta p)L$. The definition of optimality above implies that $a^* + b^* + (p^* - \Delta p^*)L < a + b^* + (p - \Delta p)L$. This implies that $a^* + (p^* - \Delta p^*)L < a + (p - \Delta p)L$. Therefore, the firm will play C and the unique efficient equilibrium of $I(C)$; $II(C)$ will obtain.

This result is driven by the assumption that II knows what I does before II moves; it assumes, that is, that II is perfectly informed of the product's care level.¹²⁸ If II does not know what I has done, redraw the figure omitting the payoffs (which are unchanged) but adding an information set.

Here, multiple equilibria are possible, some of which are inefficient. To see why, suppose that $b^* < bn^*$. Then let d be the probability the consumer assigns to the chance the firm was careful (played C). If d is high enough, the consumer will play b^* . Where $b^* < bn^*$, the firm's best response to this move is to play N . A play of b^* is contributory negligence given the firm's choice of N , so the firm that plays N incurs no accident costs, and it will then play N because $a < a^* + (p^* - \Delta p^*)L$. Hence, this equilibrium is inefficient; each party's care is suboptimal. This is one example of how imperfect information—here, supposing a firm has taken care when it has not—can yield inefficient equilibria.

These results can be avoided if the consumer can always shift losses to the firm by playing b^* . If so, the firm's choice reduces to playing C and bearing $a^* + (p^* - \Delta p^*)L$ or playing N and bearing $a + (p - \Delta p')L$. With regard to $\Delta p'$, since the consumer is in fact behaving suboptimally, she

128. Rea, *supra* note 80; Haddock & Curran, *supra* note 80; and Shavell, *Torts in which Victim and Injurer Act Sequentially*, 26 J.L. & ECON. 589 (1983), all assume that the actor who moves second knows what the first actor did. This assumption is often plausible but must be rejected when imperfect information as to product safety is supposed, because here the first move is to build a level of safety into the product.

reduces accident costs by $\Delta p' < \Delta p$. It was shown above that $a^* + (p^* - \Delta p^*)L < a(p - \Delta p)L$, so the firm's incentive to behave carefully is even stronger here. Consequently, the unique and efficient equilibrium in which both parties take care will obtain if contributory negligence is defined to mean that a consumer bears no losses only when he incurs b^* , that is, acts as carefully as he should act if the product is safe.¹²⁹

This result could not obtain under a legal rule of strict liability with comparative negligence. The consumer above chooses b^* or is careful, because otherwise she would bear p^*L , the full cost of the accident. Under a comparative negligence regime, the consumer bears a portion, call it r , of the loss, where r is zero if the consumer is careful and one if the firm is careful but she is not. Then in a design defect case, if the consumer's lack of care and the firm's due care is established, the consumer would bear p^*L , and for the reasons given above, she will choose b^* instead. But the firm's care cannot be established, in the design defect context, without using the risk/benefit test. Negligence is to fail this test. If the test is abandoned, there is no nonarbitrary way to choose a value for r after consumer negligence is established, since this value is a function of comparing the parties' negligence. Either consumer negligence must bar recovery altogether, in which event there is no comparative negligence rule, or the jury must pick random values for r . If that occurs, there again is no comparative negligence rule. Simply put, comparative negligence cannot coexist with strict liability. Since contributory negligence can and does lead to efficient outcomes, the strict liability with contributory negligence rule should be adopted.

129. This proposed solution is consistent with Cooter's view that strict liability is preferable to negligence when it is more difficult to calculate due care levels than damages. This is a correct description of design defect litigation, especially if, as suggested here, pain and suffering recoveries are abolished. See Cooter, *Prices and Sanctions*, 84 COLUM. L. REV. 1523 (1984). It also is consistent with Margolis' recent argument that strict liability with contributory negligence is efficient when it is easier to ascertain whether consumers took care than whether producers took care. See Margolis, *Two Definitions of Efficiency in Law and Economics*, 16 J. LEGAL STUD. 471 (1987).