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Abstract: This paper presents a largely positive analysis of products liability law, in the sense that it aims to predict the incentive effects and the welfare consequences of the law, with close regard to its specific legal tests and the real-world constraints that impinge on these tests. The other major part of this paper is a normative assessment of the parts of products liability law that should be reformed. In contrast with the prevailing law and economics literature suggesting that products liability law reduces social welfare, I argue that the law probably improves social welfare, though it is in need of reform in several respects.

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I. Introduction

No area of the law is perfect, and this truism certainly applies to products liability. But products liability law has come in for some unusually harsh criticism in the law and economics literature of late,[1] and much of the treatment of this area by economically-oriented legal scholars has been negative for at least a generation.[2]

This paper offers a balanced economic assessment of products liability law. Any reliable assessment of the overall welfare impact of the system will have to depend on empirical work. Economic theory can do no more than offer predictions about the incentives created by the law, hypotheses about the law's welfare effects, and identify the empirical questions that should be addressed.

This paper is largely a positive analysis of products liability law,[3] in the sense that it aims to predict the incentive effects and the welfare consequences of the law, with close regard to its specific legal tests. The other major part of this paper is a normative assessment of the pieces of the law that arguably should be reformed. My overarching goal is to set up a framework that can be used both to understand and to criticize the law.

In contrast to the law and economics literature suggesting that products liability law is one big mistake, and perhaps should be abolished, I argue that the law probably improves social welfare, though it is in need of reform in several areas. For judges and lawyers who have to work within the existing framework, my hope is that a tailored set of reforms would be more useful than the broad-brush critiques that have dominated the law and economics literature on products liability. On the other hand, a strictly positive economic theory would also be less useful to courts because it would suggest that everything could be just fine. To the extent that there are puzzles about the effects and the likely function of the law, a positive theory can provide answers;[4] but the law is so well entrenched, and so often critiqued, that a normative component is clearly desirable in this case.

Products liability law operates largely on products that have observable utility and hidden risks, relative to the safer alternatives available on the market. The observable-utility feature offers an advantage that attracts consumers. The hidden-risk feature leads to injuries. This combination

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[1] A. Mitchell Polinsky & Steven Shavell, *The Uneasy Case for Product Liability*, 123 HARV. L. REV. 1437 (2010). For a response to the Polinsky and Shavell article, see John C. P. Goldberg & Benjamin C. Zipursky, *The Easy Case for Products Liability Law: A Response to Professors Polinsky and Shavell*, 123 HARV. L. REV. 1919 (2010).

[2] James M. Buchanan, *In Defense of* Caveat Emptor, 38 U. CHI. L. REV. 64 (1970); George L. Priest, *The Invention of Enterprise Liability: A Critical History of the Intellectual Foundations of Modern Tort Law*, 14 J. LEGAL STUD. 461 (1985). A somewhat less negative, though still largely negative, assessment is offered in W. KIP VISCUSI, REFORMING PRODUCTS LIABILITY (Harvard Univ. Press, 1991). Viscusi focuses his criticism on design defect litigation, and proposes detailed changes in the law.

[3] For an early positive economic analysis of products liability law, see William M. Landes & Richard A. Posner, *A Positive Economic Analysis of Products Liability*, 14 J. LEGAL STUD. 535 (1985). Given the substantial changes in the law since 1985, the arguments of the Landes-Posner study need to be reconsidered, perhaps rejected in some instances and updated in others. That is what this paper does.

[4] *Id.* at 535. But positive theory may seem Pollyannaish to courts given current controversies in products liability law.

of features is unlikely to be regulated well by the market. The market is likely to fail, for these products, in providing incentives for optimal consumption or for producers to make welfare-enhancing design changes. In contrast, for products with open and obvious risks, the market is likely to regulate optimally, in the sense that where alternative designs exist that offer equivalent utility and less risk, the market will effectively exclude the riskier products.

The law has the potential to correct the market's failures. Moreover, the scope of the market that is regulated by products liability law is so vast that the work of courts cannot be supplanted by government regulatory agencies, even if it were possible to avoid problems such as agency capture and languid public-sector incentives. Even in the absence of capture or dull incentives, courts applying liability rules to producers have an advantage over government regulators because they respond to real injuries rather than breaches of regulatory orders, which may or may not generate serious injuries.

However, there are some glaring inefficiencies in the products liability system. The cost of litigation is passed on, at least in part, to the consumer, in the form of an implicit liability premium substantially greater than the amount required to fund a compensation scheme for injured consumers. Effectively, consumers must pay a tax on products that supports a comparatively inefficient and administratively cumbersome litigation industry.[5] In addition, products liability law fails to send the right signals for precaution and for product search on the part of product buyers, a group that includes businesses as well as ordinary consumers.

The law can be reformed so that it comes closer to its potential by addressing problems observed in several pockets of products liability doctrine. The reforms I propose require no legislative intervention; they are capable of being implemented by courts. I consider this an ideal feature of any list of reforms because legislative intervention runs the risk of political stalemate and interest-group meddling. The subjects I suggest for reform are: (1) the feasible safe alternative requirement, (2) legal doctrine governing ambiguous risk-utility tradeoffs (or what I refer to below as "risk-risk" tradeoffs), (3) insurance market inefficiencies (adverse selection and moral hazard), (4) preemption, (5) bright line rules versus vague standards, and (6) controlling incentives for fraud in mass torts. This is by no means an exhaustive list of all of the potential areas of reform in products liability law. But it does address some of the key sources of uncertainty and excessive cost in the system.

My analysis of incentives and welfare effects proceeds in several stages. First, I employ the supply and demand curve framework, familiar from elementary economics courses, to examine the effects of strict producer liability in markets with informed consumers and in markets with uninformed consumers.[6] I analyze consumption effects and design incentive effects in an ideal setting in which there are no litigation costs or insurance market inefficiencies. In this ideal setting, strict producer liability leads to socially preferable consumption and design decisions (i.e., enhancing society's welfare), in comparison to a rule of no liability, when consumers are

[5] While markets are under constant pressure to reduce costs and increase quality, this is not so for courts, which do not face competition.

[6] See Steven Shavell, *Strict Liability Versus Negligence*, 9 J. LEGAL STUD. 1 (1980); A. MITCHELL POLINSKY, AN INTRODUCTION TO LAW AND ECONOMICS (4th ed. 2011).

not informed about product risks.[7] I then move away from the ideal setting by incorporating litigation costs, uncertainty over the application of the liability rule, and insurance-market inefficiencies, all of which point to the conclusion that the welfare effects of strict producer liability are ambiguous. In the third part of the argument, I apply the analysis to the actual legal tests generated in the products liability case law, the risk-utility and consumer expectations tests. I examine how the actual tests perform under ideal market conditions and under real-world conditions.

In the ideal setting, the consumer expectations test is socially preferable to the risk-utility test. This is because the risk-utility test generates socially excessive consumption when incremental risk is less than incremental utility (i.e., positive net utility designs), and the two tests perform equivalently with respect to design incentives. In the real-world analysis, which allows for litigation costs and insurance-market inefficiencies, it is no longer clear that the consumer expectations test is preferable to the risk-utility test. With complex products, unobservable risk is always present, which implies that the consumer expectations test forces the manufacturer to provide a costly and inefficient form of insurance to the consumer. In contrast, the risk-utility test has the feature that it spreads the payoffs between positive net and negative net utility designs. In a world of expensive litigation and uncertainty, this feature probably makes the risk-utility test preferable to the consumer expectations test, in terms of its effects on consumption and design incentives.

I focus on product design litigation because that is the most controversial area of products liability.[8] The other two major areas of products liability litigation, manufacturing defect and failure to warn lawsuits, have generated relatively clear law and raise fewer difficulties in analyzing incentive effects. I argue, in Part IV, that the simple strict liability rule that applies in manufacturing defect cases – i.e., defects that result from glitches in the manufacturing process – is defensible in light of the information and expectations consumers are likely to have. In a market in which the vast majority of products are not dangerous due to manufacturing glitches, a paradox of safety will hold: consumers will not search for defects due to glitches for the same reason that they do not search for zebras in Central Park; they are unlikely to find any. In light of this safety paradox, strict liability enables the market to distinguish (and ultimately usher out of circulation) products generated from low-quality manufacturing processes. Failure to warn litigation is less controversial and defensible for a different reason: it is simply a species of negligence litigation, which courts have managed for hundreds of years.[9]

Part II provides a brief history of the law and the evolution of policy in the courts. Part III sets out the economics of products liability law; first analyzing the effects of a simple strict liability rule, and then looking at the effects of the actual legal tests. I examine the law's effects on

[7] When consumers are informed as to product risks, liability cannot improve upon the market outcome. *See* Buchanan, *supra* note 2, at 66-67 (arguing that imposition of strict liability harms consumers who knowingly purchase risky products, because it "closes off mutually advantageous exchanges" between these consumers and firms willing to sell risky products at cheap prices); *see also* POLINSKY, *supra* note 6, at 114-116.

[8] *See* Aaron D. Twerski & James A. Henderson, Jr., *Manufacturer's Liability for Defective Product Designs: The Triumph of Risk Utility*, 74 BROOK. L. REV. 1061, 1062 (2009).

[9] I realize that the history of negligence doctrine is itself a controversial topic, and one that is beyond the scope of this paper. Holmes argued that the fault principle had been part of the common law from the earliest reported decisions, see Oliver Wendell Holmes, The Common Law 85-90 (Little, Brown & Co. 1881).

consumption and design choice incentives. Part IV discusses manufacturing defect and failure to warn litigation. Part V summarizes the implications of the positive analysis and examines reform proposals.

II. Background on Law and Policy

So much has been written on the development of products liability doctrine that there is little need for an extended discussion here.[10] Instead of tracing the development of the law I will focus on the policies reflected in it, and its implications for the incentives of sellers and manufacturers.

There is general agreement that the first important innovation in products liability law was the abandonment of the privity doctrine of *Winterbottom v. Wright*.[11] Under the privity rule, a consumer injured by a negligently constructed product could maintain a negligence action only against the immediate seller, i.e., the party with whom he was in privity of contract.[12] The privity requirement was effectively abandoned in Cardozo's celebrated *MacPherson v. Buick Motor Co.*[13] decision.

Although *MacPherson* is commonly viewed as a dramatic break from the preexisting law on products liability, it can also be seen as a thoroughly predictable evolutionary outcome of the common law process. The privity doctrine, like every other common law rule, had generated substantial exceptions over its life. Judge Sanborn provided a summary of the exceptions in *Huset v. J.I. Case Threshing Machine Co.*:[14]

> The first is that an act of negligence … which is imminently dangerous to … life or health… and which is committed in the preparation or sale of an article intended to preserve, destroy, or affect human life, is actionable by third parties...
>
> The second exception… [applies to]… an owner's act of negligence which causes injury to one … invited by him to use his defective appliance upon the owner's premises…
>
> The third exception … is that one who sells or delivers an article which he knows to be imminently dangerous to life or limb … without notice of its qualities is liable to any person who suffers an injury therefrom …

These three exceptions, especially the first and third, are capable of such broad interpretations that it is important to ask how they were limited and under what conditions the exceptions failed to apply. The first exception was understood during the privity era to apply to things like poisons, explosives, and drugs.[15] In *Thomas v. Winchester*,[16] a consumer was allowed to recover

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[10] *See, e.g.*, Priest, *supra* note 2; Gary T. Schwartz, *New Products, Old Products, Evolving Law, Retroactive Law*, 58 N.Y.U. L. REV. 796, 796-802 (1983).
[11] Winterbottom v. Wright, 152 Eng. Rep. 402 (Ex. 1842).
[12] *Id.* at 403.
[13] MacPherson v. Buick Motor Co., 217 N.Y. 382 (1916).
[14] Huset v. J.I. Case Threshing Mach. Co., 120 F. 865, 867-68, 870-71 (8th Cir. 1903).
[15] *See* Dixon v. Bell, 5 Maule & Sel. 198. 105 Eng. Rep. (1816) (allowing a third party to recover for damages due to the act of leaving a loaded gun with a young girl who shot the third party); Wellington v. Downer Kerosene Oil

from a seller who falsely labeled a poison and sold the falsely-labeled poison to a drugstore. *Thomas* fits neatly into the first exception and indicates that during the privity era courts interpreted the words "preserve, destroy, or affect human life" in the narrowest sense. Items that were understood to have this property were drugs or instruments designed to preserve life, and firearms designed to destroy life.

The third exception applied when the seller knowingly passed on a defective product without giving notice of its qualities, and the product was dangerous to life or limb. Thus, a seller who did not know of the latent defect could not be held liable under the third exception; and a seller who passed on a product whose defects were immediately obvious would also avoid its reach.

MacPherson scrapped the privity rule by interpreting the first exception expansively; it would no longer be applied only to drugs and explosives, it would also apply to cars and other items that could be dangerous to life or limb if negligently constructed. *MacPherson* involved a four party transaction rather than the familiar three party (manufacturer, retailer, customer) transactions of the privity cases. The defendant, Buick, had acquired a defective car wheel from a supplier. Buick installed the wheel and sold the car to a dealer, who then sold it to MacPherson. MacPherson was injured when the wheel crumbled, and sued Buick.

By applying the first exception to the privity rule in *MacPherson*, the court implied that the manufacturer of a product has a general duty to inspect for latent defects in components purchased from other manufacturers.[17] The manufacturer's failure to do so would not lead to liability on a theory of fraud, as possibly implied by the third exception, but under a theory of negligence based on his failure to conduct a reasonable inspection of the product.

While *MacPherson* stands as the most important landmark in the history of products liability doctrine, there are two others. One is Judge Traynor's concurring opinion in *Escola v. Coca Cola Bottling Co. of Fresno*.[18] The other is the adoption of the strict products liability doctrine by the *Restatement (Second) of Torts* in 1965, which was followed by widespread acceptance in the case law.[19]

Judge Traynor's opinion in *Escola* presents several theories supporting strict liability for injuries caused by defective products. The most influential theories set out by Traynor I will label as the deterrence rationale, the reliance rationale, the insurance rationale, and the administrative costs rationale.

Co., 104 Mass. 64 (1870) (allowing plaintiff to recover damages resulting from defendant corporation that sold naptha – an explosive liquid – to a lamp fluid retailer); Norton v. Sewall, 106 Mass. 143 (1870) (allowing plaintiff to recover damages resulting from defendant selling laudanum, a poison, as rhubarb, a medicine, to an intermediary); Bishop v. Weber, 139 Mass. 411 (1885) (holding caterer liable for furnishing unwholesome food to guests, explicitly rejecting a theory of implied contract in favor of negligence theory). *Dixon*, *supra*, did not involve a transaction, but it has been treated as within the set of cases leading to the first exception to the privity rule. See, e.g., Edward H. Levi, *An Introduction to Legal Reasoning*, 15 U. CHI. L. REV. 501, 507-519 (1948).

[16] Thomas v. Winchester, 6 N.Y. 397 (1852).

[17] MacPherson, 217 N.Y. at 389.

[18] Escola v. Coca Cola Bottling Co. of Fresno, 150 P.2d 436, 440 (1944) (Traynor, J., concurring).

[19] Since then, a substantial majority of jurisdictions have adopted the basic position which it espouses. WILLIAM L. PROSSER, HANDBOOK OF THE LAW OF TORTS 657-658 (4th ed. 1971).

The deterrence rationale holds that strict products liability provides an incentive for the party best able to control product accidents to take steps to minimize their occurrence. The modern law and economics literature has introduced a more sophisticated version of this rationale, one that emphasizes the role strict products liability plays in controlling excessive consumption of risky products.[20] Under strict liability, the price of the risky product would reflect its level of risk, so that consumers would shift their purchases from risky products toward comparatively safe products.[21] I will examine the consumption effect in more detail later in this paper.

Outside of the consumption effect, the case on deterrence grounds for choosing strict products liability over negligence requires a much more subtle argument than that offered by Traynor. Traynor argued that strict products liability would encourage manufacturers and sellers to take more care in the preparation and sale of products, but that is not clear if one looks closely at incentives. One of the basic lessons of the law and economics literature is that the precautionary incentives provided by negligence and by strict liability are, to a first approximation, equivalent.[22] In other words, if one is deciding *how much care* to take in some activity, such as driving, the level of care that would be privately optimal would be the same whether the law imposes strict liability or negligence. Of course, this proposition is based on a simple model of incentives that ignores the likelihood of judicial error and the impact of litigation costs. Still, if one imagines the initial thought processes of someone who actually considers the potential liability costs under a negligence rule or under strict liability, the conclusion that the incentive effects are the same is probably valid as a description of first impressions. Someone who thinks superficially about the incentive implications would probably start with the assumption that courts are accurate and that litigation costs would not prevent a tort victim from filing a claim.[23]

Given the likelihood that strict liability and negligence would have equivalent effects on precautionary incentives, the case for choosing strict liability instead of negligence, as a method of controlling the incentive to take care, would have to point to the capacity of strict liability to regulate care along margins that are unlikely to be affected by the negligence rule. One plausible argument, unaddressed by Traynor, is that strict liability regulates the incentive to take care *along margins that are unobservable to plaintiffs*.

Indeed, for negligence to actually control care-taking incentives, the victims of negligence must be able to identify the negligent acts that would justify a lawsuit. However, if victims cannot identify the negligent acts or omissions, they will not be able to formulate negligence theories based on those occurrences, and negligence law will not serve effectively as a regulator of

[20] Shavell, *supra* note 6, at 4; Polinsky, *supra* note 6, at 114-115.
[21] STEVEN SHAVELL, FOUNDATIONS OF ECONOMIC ANALYSIS OF LAW 213 (2004); MARK A. GEISTFELD, PRINCIPLES OF PRODUCTS LIABILITY 43-44 (2006); Stephen F. Williams, *Second Best: The Soft Underbelly of Deterrence Theory in Tort*, 106 HARV. L. REV. 932, 932 (1993); see also Buchanan, *supra* note 2, at 66 (arguing strict liability will increase the cost of products overall, but the cost of risky products more dramatically, effectively pricing risky products out of the market.)
[22] Shavell, *supra* note 21, at 213-214.
[23] For a potential tortfeasor who thinks beyond the superficial level, litigation costs and error probabilities will affect their incentives. See Keith N. Hylton, *Costly Litigation and Legal Error under Negligence*, 6 J. L. ECON. & ORG. 433 (1990).

precautionary incentives.[24] In this event, strict liability has an advantage over negligence and can generate superior precautionary incentives.

While cases of unobservable negligence in preparation and sale may have been common at the time of Traynor's opinion, they are probably much less so today. Plaintiffs often hire experts who are familiar with the manufacturing and marketing of products, and can generate all of the relevant theories of negligence.[25] But being able to generate a theory of negligence is not the same as being able to prove it. Plaintiffs are probably capable of generating a complete list of relevant negligence theories in today's litigation environment, but defendants may benefit from an informational advantage.[26] In sum, while the notion of unobservable negligence is far less likely to be a serious issue today than it was in Traynor's time, it has not completely disappeared as a factor influencing litigation outcomes.

The reliance rationale holds that strict products liability is an improvement over negligence because consumers in the era of mass production have relied on the assurances of manufacturers.[27] Product sellers attempt to create brands in order to form loyalty bonds with consumers.[28] Consumers are led by these loyalty-creation efforts to assume that the products sold through established channels will be safe for consumption. The reliance theory implies that this expectation of safety may be applied across the board to all products. Consumers with limited capacities to distinguish products and recall the specific promises of individual sellers are likely to treat all products as if they carry, to some degree, a guarantee of reliability and safety.[29]

The reliance rationale should be viewed as a part of the deterrence rationale rather than, as in Traynor's view, a separate theory. The deterrence rationale relies on the assumptions that manufacturers will take too little care in the absence of liability, and that consumers will be unable to accurately assess the degree of risk presented by a specific product in the market. Both of these assumptions are necessary under the deterrence rationale, because if consumers could correctly assess the level of risk, there would be no problem of excessive consumption.[30] In

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[24] The doctrine of res ipsa loquitur is designed to enable the plaintiff to recover in many of these settings, but the plaintiff's claim has to satisfy the conditions required by the doctrine: (a) the event must be of a kind which ordinarily does not occur in the absence of someone's negligence, (b) it must be caused by an agency within the exclusive control of the defendant, and (c) it must not have been due to any voluntary action or contribution of the plaintiff. WILLIAM L. PROSSER, HANDBOOK OF THE LAW OF TORTS 214 (1971). If the plaintiff's claim does not satisfy the conditions of res ipsa doctrine, the inability of the plaintiff to articulate a precise theory of negligence will be fatal to his claim.

[25] William A. Donaher, Henry R. Piehler, Aaron D. Twerski & Alvin S. Weinstein, *The Technological Expert in Products Liability Litigation*, 52 TEX. L. REV. 1303, 1310-1311 (1974).

[26] Obviously, the defendant has access to better information on his own compliance with the legal standard. The discovery process can reduce the defendant's informational advantage, but it is unlikely to eliminate it. See Bruce L. Hay, *Civil Discovery: Its Effects and Optimal Scope*, 23 J. LEGAL STUD. 481 (1994).

[27] Escola v. Coca Cola Bottling Co. of Fresno, 150 P.2d 436, 467 (Traynor, J., concurring); Robert Dorfman, *The Economics of Products Liability: A Reaction to McKean*, 38 U. CHI. L. REV. 92, 99-100 (1970).

[28] *Escola*, 150 P.2d at 467 (Traynor, J., concurring).

[29] In other words, if consumers have limited capacities for information storage, they will find it difficult to distinguish products that have a guarantee of safety from branded products that do not. If the vast majority of branded products come with a guarantee of safety, consumers may rationally act as if all of them do. A related point has been made by Judge Posner for recognizing the dilution theory of trademark protection. *See* Ty Inc. v. Perryman, 306 F.3d 509, 510 (7th Cir. 2002).

[30] Buchanan, *supra* note 2, at 68.

addition, the precaution that manufacturers are observed taking would be the appropriate level for the risk preferences of their consumers.[31]

The insurance rationale holds that strict products liability is desirable because it spreads the risks of injuries caused by defective products. Under this theory, consumers who purchase Coca-Cola are better off under strict liability because they will be compensated in the event that a Coke bottle explodes in their hands. The law forces them, in a sense, to purchase an insurance policy along with the product. The theory obviously has limits; in real insurance markets, consumers make voluntary choices to buy coverage, and often have the option to limit their coverage to the particular risks they are likely to face. Under the strict liability regime, however, consumers have no such choice, and this has important implications for the validity of the insurance theory.

The administrative costs rationale holds that strict products liability gets courts to the same endpoint that they would reach under the negligence rule, but does so in a cheaper fashion. Instead of jumping through the hoops of asserting negligence and relying on the doctrine of *res ipsa loquitur*, consumers could sue on the basis of strict liability and forgo the extra costs of attempting to prove negligence.

Whether strict products liability would provide an administrative cost savings is an empirical question, which remains largely unaddressed today.[32] Traynor assumed that there would be a savings of administrative costs because of the greater ease of pleading and of proving strict products liability. But this argument ignores the inevitable development of defenses under strict products liability and the greater volume of litigation that would result if strict liability actually did reduce the cost of prosecuting a lawsuit.

This is not an exhaustive list of the arguments marshaled by Traynor in favor of strict liability.[33] However, the insurance, deterrence, and administrative cost theories are the most general a priori policy grounds offered for strict products liability, and for that reason probably the most persuasive to lawyers, judges, and academics who take an instrumental view of the law.

The Traynor opinion had its largest immediate impact in the arena of ideas rather than in the case law. The American Law Institute was moved at least in part because of Traynor's arguments to adopt strict products liability in section 402A of the *Restatement (Second) of Torts* in 1965.[34] However, before the publication of section 402A there were, in fact, very few cases, if any, that clearly relied on Traynor's theory in order to hold a product seller liable. *Greenman v. Yuba*

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[31] *Id*; Dorfman, *supra* note 27, at 98.

[32] Shavell, *supra* note 21, at 282-283.

[33] *See e.g.*, *Escola*, 150 P.2d at 462 (Traynor, J., concurring) (explaining that responsibility should be fixed on the party who can most effectively reduce hazards in defective products).

[34] *See* Fleming James, Jr., *A Tribute to the Imaginative Creativity of Roger Traynor*, 2 HOFSTRA L. REV. 445, 445-446 (explaining that Traynor's views in *Escola* were adopted in *Greenman v. Yuba Power Products, Inc.*, 377 P.2d 897 (Cal. 1963), which in turn, was embodied in RESTATEMENT (SECOND) OF TORTS, § 402A (1965)); Richard W. Wright, *The Principles of Product Liability*, 26 REV. LITIG. 1067, 1068 (2007) (describing Traynor's concurrence as being "ratified and adopted" in *Greenman*, which in turn was a "catalyst" for section 402A, "based on the same rationales" as *Greenman*); *cf.* Priest, *supra* note 2, at 498-99, 505, 513-517 (arguing Traynor's concurrence "set[] the grounds" for the strict products liability standard adopted in, among other jurisdictions, California (in *Greenman*), a result William Prosser used to advocate for the adoption of section 402A).

Power Products[35] is sometimes cited as the first case applying the strict products liability theory, but this theory appears in *Greenman* (in an opinion for the court written by Traynor) only as a basis for upholding a lower court decision that was itself based on negligence and warranty theories. The same can be said of the other major case often cited, *Goldberg v. Kollsman Instruments Corp.*,[36] where the plaintiff, a plane crash victim, brought a negligence claim against American Airlines, and breach of implied warranty claims against the airplane manufacturer (Lockheed) and an instrument supplier (Kollsman). By a four-to-three vote the appellate court upheld the judgment against Lockheed, citing *Greenman*'s theory of strict liability. Again, this falls far short of supporting the claim that courts had begun to adopt Traynor's theory.

There are two views on the adoption of strict products liability in section 402A. One, advanced provocatively by George Priest, is that the American Law Institute was bamboozled, so to speak, into adopting strict products liability theory by the persuasive effort of William Prosser.[37] According to this view, Prosser led the American Law Institute to believe that there was a dominant trend of cases adopting the strict products liability theory, when in fact there was not. After the American Law Institute accepted the theory, courts were then led to believe such a trend existed, and cited the Restatement for support as they rushed to adopt the theory.

The alternative view, which Priest does not consider in his critique, is that the American Law Institute was merely getting ahead of the curve, and adopting a doctrine that would soon be accepted by courts generally. Under this view the American Law Institute appears as a facilitator of legal evolution, as a body that can play the role of speeding without affecting the direction of doctrinal change, sometimes by creating apparently discontinuous jumps in the path of legal doctrine.[38] While under the Priest view, the American Law Institute appears as an entity that produces private legislation to the detriment of the common law process and the common law, the alternative view would treat the ALI as a facilitator of the transition between common law regimes without substantially altering the content of the law.

It is beyond the scope of this paper to try to say which of these views is correct. But I am inclined to believe the alternative view in this case. The products liability regime ushered in by the Restatement and the courts does have a consistent theoretical core, which I hope to expose below. This is a characteristic that one does not find in private legislation, or in legislation generally. Moreover, the ALI has more to lose than anyone else in attempting to enact private legislation disconnected from the real case law. Courts are decentralized, and do not have to hand down decisions that comply with the ALI's Restatement project.[39] Presumably they would stop reading the ALI if it pushed its luck too far in attempting to shape the common law.

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[35] Greenman v. Yuba Power Products, Inc., 377 P.2d 897 (Cal. 1963).
[36] Goldberg v. Kollsman Instruments Corp., 12 N.Y.2d 432 *(*1963).
[37] Priest, *supra* note 2, at 512-57.
[38] See Oona A. Hathaway, *Path Dependence in the Law: The Course and Pattern of Legal Change in a Common Law System*, 86 IOWA L. REV. 601, 641-645 (2001).
[39] *See* Herbert W. Titus, *Restatement (Second) of Torts Section 402A and the Uniform Commercial Code*, 22 STAN. L. REV. 713, 717 (1970) (explaining that some states refused to follow section 402A's strict products liability standard, and predicting a future conflict between section 402A and the Uniform Commercial Code). *See, e.g.*, Cline v. Prowler Indus. of Maryland, Inc., 418 A.2d 968, 978 (Del. 1980) (holding the Uniform Commercial Code's sales provisions preempt strict products liability, as described in section 402A, in cases involving the sale of goods); Swartz v. General Motors Corp., 378 N.E.2d 61 (Mass. 1978) (holding "there is no 'strict liability in tort' apart from

Section 402A provides the first effort at a general statement of products liability law. Although the Second Restatement provides only one theory of liability,[40] the consumer expectations test, the law would soon develop into a rich set of doctrines revolving around three theories.[41] One type of products liability claim is brought in the case of a *manufacturing defect*, which is a glitch that occurs in the course of making a product. The typical manufacturing defect case involves a product that deviates from the manufacturer's design and from other units of the same product made by the manufacturer. Thus, consider a manufacturer of widgets; one widget in every 1,000 deviates from the norm, and is defective in a way that is potentially harmful to the consumer. A consumer who is injured by such a widget can bring a claim on a theory of absolute liability against the manufacturer or seller. The plaintiff is not required to prove fault, or unreasonableness of any sort. If the plaintiff can present enough evidence to support the inference that his injury is due to the defective widget, and that the product defect was there when the product left the seller's hands, he has won his case. Thus, the plaintiff is required only to produce evidence that the defect exists, and that excludes the possibility that the defect is due to his own mishandling or the conduct of some third party.

A second theory of strict products liability governs the case of a *design defect*. The design defect claim asserts that the manufacturer's design is itself unreasonably dangerous. There are two tests courts have applied: the *consumer expectations* test and the *risk-utility* test. Under the consumer expectations test, the plaintiff is required to show that the product failed to conform to the safety expectations of the average consumer. Under the risk-utility test, the plaintiff is required to show that the product is unreasonably dangerous in the sense that the incremental risk associated with the defendant's chosen design far exceeds the incremental utility when compared to an alternative safer design.

One source of potential variation in the law is whether prevailing on the consumer expectations test is sufficient for the defendant, or whether the defendant must prevail on both tests in order to win his case. Some important jurisdictions, most notably California in *Barker v. Lull Engineering Company, Inc.*,[42] have held that the defendant must prevail on both tests.[43] Some others have suggested that the defendant prevails if his product satisfies the consumer expectations test.[44] Under the consumer expectation test, the defendant will prevail if the defect

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liability for breach of warranty under the Uniform Commercial Code"); Sensenbrenner v. Rust, Orling & Neal, Architects, Inc., 374 S.E.2d 55, 57 n.4 (Va. 1988) ("Virginia law has not adopted § 402A of the Restatement (Second) of Torts and does not permit tort recovery on a strict-liability theory in products-liability cases"), *superseded by statute on other grounds*, VA. CODE ANN. § 8.01-223 (2011).

[40] This is contestable. *See* James A. Henderson & Aaron D. Twerski, *Achieving Consensus on Defective Product Design*, 83 CORNELL L. REV. 867, 879 (1998). Henderson and Twerski note that the author of section 402A, William Prosser, contended that negligence principles were to determine the application of products liability law, in spite of the consumer expectations language used in section 402A.

[41] DAVID G. OWEN, PRODUCTS LIABILITY LAW 344-45 (2d ed. 2008) (listing the "three types of defect" in products liability as manufacturing defects, design defects, and warning defects); Sheila L. Birnbaum & Barbara Wrubel, *"State of the Art" and Strict Products Liability*, 21 TORT & INS. L.J. 30, 30 (1985) ("Traditionally, three categories of product defect have been recognized as providing a basis for the imposition of liability upon manufacturers and sellers: defect in manufacture, defect in design, and defect by reason of the absence or inadequacy of a warning.").

[42] Barker v. Lull Eng'g Co. Inc., 573 P.2d 443 (Cal. 1978).

[43] *See* Twerski & Henderson, *supra* note 8, 1098-1104.

[44] *Id*. at 1104-1106.

in question is deemed "open and obvious" by the court.[45] Thus, the survivors of a state trooper felled by bullets that hit areas unprotected by his bullet-proof vest lost their design defect claim against the vest maker because the risk of such an event was obvious.[46]

Although the law governing design defect cases has been set out with varying legal formulations in each state, the case law suggests a general adoption of the risk-utility approach.[47] As Henderson and Twerski note, the consumer expectations test has been limited as a theory for the plaintiff in California by later decisions.[48] On the defendant's side, many of the cases in which courts have rejected plaintiffs' design claims on the ground that the defect was open and obvious involve risky features that are also central to the function of the product – such as the open arm vents of a bullet-proof vest.[49] Where the risky characteristic is central to the function of the product, then it is highly likely that a court would hold that the design is lawful under the risk-utility test.[50]

The third theory in the modern products liability case law is *failure to warn*. These cases have been examined under the negligence theory: the defendant is guilty of negligence for failing to warn where the burden of providing a warning is less than the foreseeable harms to the consumer. Special doctrines have developed in the products liability setting, such as the presumption that the consumer will heed the warning if it is given.[51] These special doctrines reflect efforts by courts to design rules that facilitate the provision of information to courts rather than radical departures from basic negligence law.

III. Products Liability Law: Economic Analysis

In this section, I present an economic analysis of strict products liability. The actual legal tests in operation – the consumer expectations test and the risk-utility test – are a bit more complicated than the simple strict products liability rule that I will examine initially in this section. The purpose for examining a simple strict liability framework is to establish some propositions that I will use in analyzing incentives under the actual legal tests.

A. Economics of the Product Market

Because I will rely on the familiar supply and demand curve framework, it is helpful to start with an introduction to basic terms. Figure 1 shows the supply and demand curve for a product, say cars. Cars come in many different styles and, in light of this, the demand and supply curves in

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[45] Linegar v. Armour of America, 909 F.2d 1150, 1154 (8th Cir. 1990).
[46] *See id*. at 1155.
[47] Henderson & Twerski, *supra* note 40, at 887; Twerski & Henderson, *supra* note 8, at 1062.
[48] Henderson & Twerski, *supra* note 40, at 898-99.
[49] *See, e.g*., Linegar v. Armour of America, 909 F.2d 1150 (8th Cir. 1990); Halliday v. Sturn, Ruger & Co., 792 A.2d 1145 (Md. 2002)(gun without safety lock).
[50] *See, e.g*., Wasylow v. Glock, Inc., 975 F.Supp. 370, 379-80 (Mass. 1996) (pistol that accidentally discharged was not defectively designed because a safer alternative would have altered its functional purpose of "getting off a shot quickly"); Bolduc v. Colt's Mfg. Co., Inc., 968 F.Supp. 16, 18 (Mass. 1997) (same).
[51] M. Stuart Madden, *The Duty to Warn in Products Liability: Contours and Criticism*, 89 W. VA. L. REV. 221, 234 (1987).

Figure 1 are shown only for one variety, the "safe model". The safe model serves as the benchmark for risk-utility analysis in products liability law.

The horizontal axis in Figure 1 measures the number of safe-model cars on the market, the vertical axis is measured in dollars-per-car. The demand curve reflects at each point the maximum price the consumer is willing to pay (willingness-to-pay) for a car – which is his evaluation of the utility, measured in dollars, that he derives from the item. Because of "declining marginal utility" (the tendency for the first unit of consumption to contribute more to utility than the second and subsequent units) consumers will pay less for additional units of the item, and so the single consumer's demand curve slopes down. The market demand curve in Figure 1 sums up the amount desired by each consumer at each price level. Thus at any given price level the market demand curve reflects (in aggregate) the consumption decision of the marginal consumer – the one who is almost indifferent between purchasing the good and going without it at the stated price. The market supply curve, on the other hand, reflects the costs of producing the item, and thus the upward slope reflects the assumption that supply costs increase as more of the item is provided to the market. The market equilibrium, where the price of the safe model is $\tilde{p}_{safe}$ and the quantity purchased on the market is $\tilde{q}_{safe}$, is observed where the price the marginal consumer is willing to pay for a safe model is just equal to the cost of supplying an additional safe model.

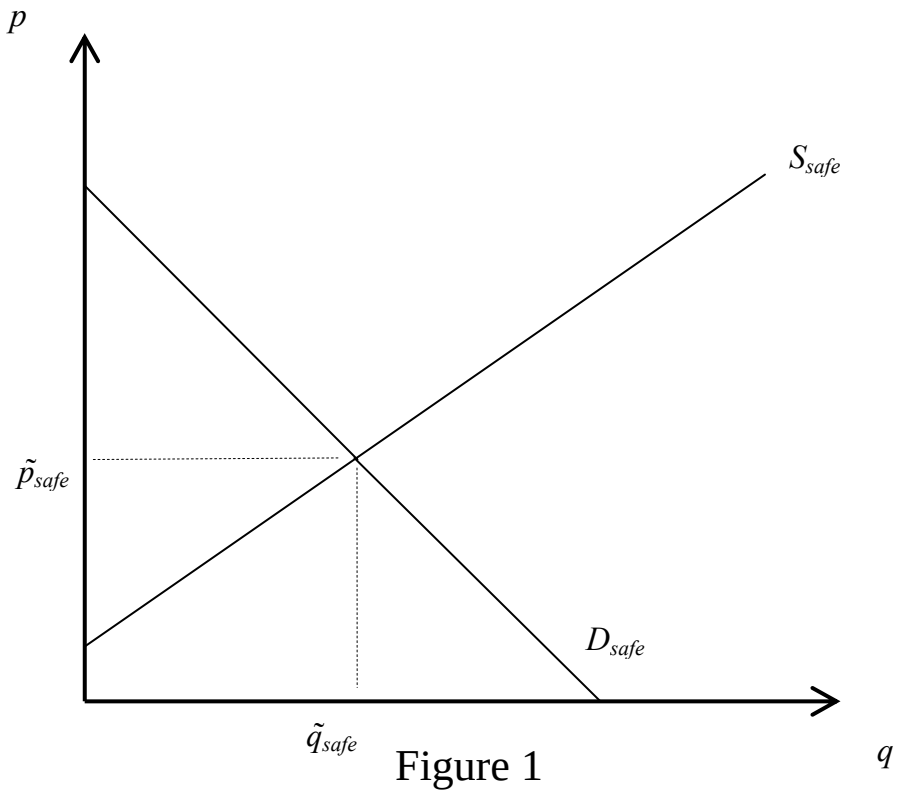

Figure 1

At levels of output below the market equilibrium, the marginal utility of an additional unit, as measured by the demand schedule, exceeds the marginal cost, as measured by the supply schedule. As the quantity increases from zero, this positive gap between marginal utility and marginal cost continues, though declining in size, until we reach the equilibrium level, where the net benefit to society from an additional unit of output is exhausted. Producing beyond the equilibrium quantity reduces social welfare because the marginal utility is less than the marginal cost of the additional unit of output. Thus, the market equilibrium is the *socially optimal level of consumption* – because the market's contribution to social welfare, as measured by the difference between aggregate consumption utility and production costs, is at its maximum level.

B. Strict Products Liability Effects

In this part I will apply the market framework just described to a simple model of strict products liability. The model assumes that the manufacturer is strictly liable for product-caused harms. The strict liability rule is similar to, though simpler than, the consumer expectations test adopted in *Restatement* section 402A. The model also assumes that there are no administrative and litigation costs associated with the liability system. I will establish a few basic propositions about the effects of strict liability in the product market, and later extend the analysis by introducing litigation costs and by considering the actual legal tests for liability.

The manufacturer has a choice between two car designs. One is Safe Model. The other, Risk Model, is more appealing to consumers but imposes higher expected accident costs. To be more concrete, suppose Safe Model is a plainly designed, relatively safe car. Risk Model has a more appealing design but contains a dangerous feature. For example, Risk Model could be the 1963 Corvair, which although appealing to the eye had a hidden danger.[52] The front end of the shaft extending to the steering wheel of the Corvair was located in front of the axis for the front wheels.[53] In a head-on collision from the left, the shaft of the steering wheel would push in toward the front seat, impaling the driver.[54]

1. Strict Liability and Regulation of Consumption

a. Uninformed Consumers

I assume as a default position that the amount a consumer is willing to pay for a product is based on observable factors that he or she likes. Thus, consumers are willing to pay more for Risk Model than for Safe Model because they can observe only the appealing features of the risky product. The safe product is comparatively boring. Figure 2 translates these assumptions into the supply and demand framework. The demand curve is higher for Risk Model than for the Safe Model, reflecting the *incremental utility* (*U* in Figure 2), measured in dollars, a consumer would perceive in acquiring that model.

As for the supply side, I assume that the costs of production and marketing are the same for the risky and safe products. Ordinarily, this would imply that the supply schedules for the risky and

[52] Larsen v. General Motors Corp., 391 F.2d 495, 505-506 (8th Cir. 1968).
[53] *Id*. at 497.
[54] *Id*. at 496-497.

safe products would also be the same. However, for expositional purposes I will introduce a notional supply curve for the risky product (S_{risk} in Figure 2) which reflects the additional injury costs generated by the risky product – i.e., the *incremental risk R*. There is nothing in this framework that requires injury costs to be treated as supply costs; under appropriate conditions they could be treated as part of the disutility of consumption. But to do so would imply consumers can observe the product's risk, which I assume not to be true in the default scenario.

The loss due to injury caused by the dangerous features of the risky product is a real cost associated with the supply and consumption of the product. Given this, the cost of injury should be reflected in a market analysis. Since this cost is not perceived by consumers when they enter the market, I treat it here as a cost of supply. This implies that the notional supply curve for the risky product is the supply schedule that reflects all of the costs borne by society, and therefore is the supply curve that should be used in order to find the socially optimal level of consumption in the setting where consumers are uninformed as to risk.[55]

We come now to a fundamental result. In the absence of producer liability, if consumers are not aware of the injury risks associated with the Risk Model (e.g., the Corvair), then they will consume a socially excessive quantity of the risky product; society's welfare could be enhanced by cutting back on consumption.[56]

To see why consumption of the risky product is excessive in the absence of producer liability, consider the market's operation when consumers are fully aware of the incremental utility of the risky product, but unaware of the incremental risk. Consumers may be attracted to the Risk Model by its design, or because of its speed, both visible attributes. The risk of injury (for example, impalement by the steering wheel shaft) is not visible. Given these assumptions, consumers will not take into account the disutility of injury; they will consider only the additional utility associated with the Risk Model. In addition, since producers are not liable for injuries caused by their products to consumers, the supply schedule for the Risk Model will not include the injury costs; it will be the same as the supply schedule for the Safe Model. Under these conditions, the market equilibrium will occur where the price the marginal consumer is willing to pay for the risky model is just equal to the cost of supplying the safe product – that is, in Figure 2 at the intersection of the Risk Model demand curve and the Safe Model supply curve (point *A*). However, the socially optimal level of consumption of the risky product will occur when the price the marginal consumer is willing to pay for the risky product is just equal to the social cost of supplying the risky product – that is, where the Risk Model demand curve intersects the Risk Model supply curve (point *B*).[57]

[55] This is a fairly conventional approach in the economic analysis of products liability, see, e.g., Polinsky, *supra* note 6, at 113-14.

[56] Guido Calabresi, *Some Thoughts on Risk Distribution and the Law of Torts*, 70 YALE L.J. 499, 503 (1961); Shavell, *supra* note 21, at 213-215.

[57] At point *B* in Figure 2, the price and output levels are $\tilde{p}_{risk}$ and $\tilde{q}_{risk}$, where $\tilde{p}_{risk} > \tilde{p}_{safe}$ and $\tilde{q}_{risk} < \tilde{q}_{safe}$.

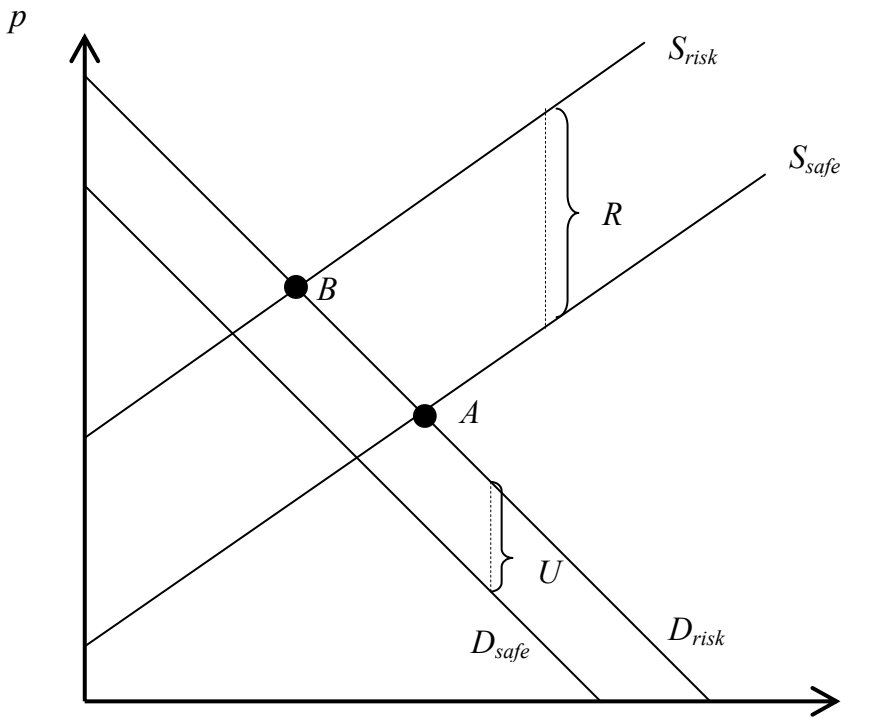

Figure 2: $R > U$

Strict producer liability improves welfare in this scenario. Under strict liability, the expected injury costs are shifted to the manufacturer, and thus the supply schedule for the risky product reflects the fact that the risky product generates greater costs, due to injury, at each level of output than does the safe product. The Risk Model's price rises, under strict liability, and consumers purchase fewer Risk Models.[58] The market equilibrium under strict liability occurs where the price the marginal consumer is willing to pay for the risky product is just equal to the social cost of supplying an additional risky model (point *B* in Figure 2). Given that the marginal utility of the consumer is equal to the marginal social cost of supply, the market equilibrium quantity under strict liability is the socially optimal level of consumption – that is, the consumption quantity where the wealth generated by the Risk Model market, measured in terms of the net benefits to consumers and producers, reaches its highest feasible level.

b. Informed Consumers

A second proposition from this framework is that if consumers are fully aware of the product's risk and utility characteristics, then strict products liability can serve no socially beneficial purpose in altering consumption levels. Suppose the consumer knows of the incremental utility of the Risk Model, and also knows to subtract the disutility due to the expected cost of injury.

[58] But note that the price increase shown in Figure 2, moving from point *A* to point *B*, is smaller than the incremental risk *R*. This reflects the assumption, in the diagram, regarding supply and demand elasticities. If supply is infinitely elastic (i.e., the supply curve is a horizontal line), the price increase will be equal to the incremental risk.

Suppose, for example, the consumer values the additional utility at $1000, but also knows, say from examining insurance prices, that the disutility due to accident risk is $2000. Because the consumer is aware of the additional risk-based cost, he will deduct that cost from the maximum price he is willing to pay for the product. In terms of the supply-demand analysis, this implies that the incremental utility of the risky model will cause its demand schedule to shift up (in comparison to the safe version), and, at the same time, the incremental risk will cause the demand schedule for the risky model to shift down. The two shifts, shown in Figure 3, yield a new equilibrium price and quantity (point *C*), where the price is lower than under strict liability and the consumption level is the same as under strict liability. The new equilibrium price is lower than the price under strict liability, because the consumer is no longer purchasing from the manufacturer mandatory insurance to cover the risk of being injured by the product. The consumer self-insures, in effect, by accepting a reduction in the price equal to the full value of the insurance premium on a policy that would compensate in the event that he is injured by the product.

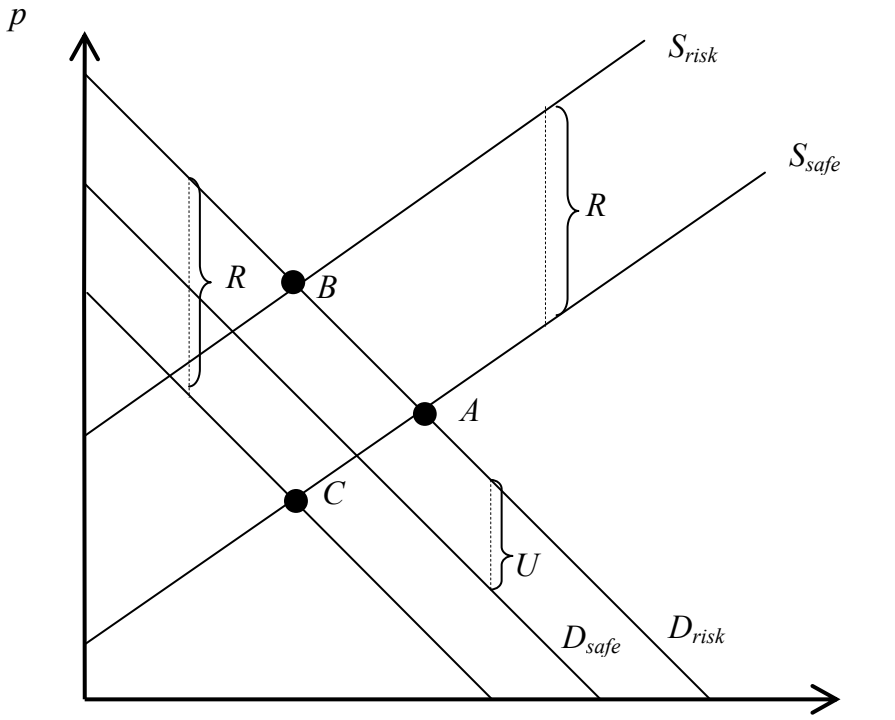

Figure 3: $R > U$

I have so far considered the case in which the consumer is unaware of the product's risk and the law imposes strict liability, and the case in which the consumer is fully aware of the product's risk and the law does not impose strict liability. The remaining case to consider is where the law imposes strict liability and the consumer knows the product's risk characteristics.

Assume the strict liability rule applies, and suppose consumers are fully aware that they will be compensated if they are hurt by a dangerous feature of the product and also aware of the specific

risk characteristics of the products they purchase. For example, the consumer may not know about the risk characteristics of the product initially, but discovers that the product is risky and that there will be compensation (say, because he reads about products liability lawsuits against the manufacturer).[59] If the compensation payment makes these fully-informed consumers indifferent as between the injury and no-injury events,[60] the equilibrium price and quantity combination will be socially optimal (point *B* in Figure 2). Why? Presumably consumers would know that they will be compensated only to the extent they are injured, so that the expected compensation offsets the expected injury. Realizing this, the consumer's demand curve would shift down by the amount of the expected injury loss, and shift up by the amount of the expected compensation. Since the two amounts are equal, the consumer's demand schedule would reflect only the product benefits but not the risk. The compensation requirement operates as mandatory insurance, funded by adding a surcharge to the price of the product.

If consumers are only partially compensated for their injuries, and they are not fully informed about the risks of the product, strict liability would push the supply curve up toward the notional supply curve S_{risk} in Figure 2, but not all the way. The product's price would rise, but not enough to fund an insurance policy that provides full compensation, in the event of injury, to the consumer. The final result – i.e., the degree to which consumption of the risky product is excessive – would depend on whether the consumer is fully informed as to the product's risk characteristics. If the consumer is fully informed, both as to the product's risk characteristics and the lack of full compensation, the market will (again) generate the socially optimal level of consumption.[61] If, on the other hand, the consumer completely discounts the risk of harm because of lack of information, then it follows that the consumption level generated by the market will exceed the socially optimal level – though the degree of over-consumption will be lower than in the case in which the producer is not strictly liable.

2. Strict Liability and Regulation of Design Choice

Another dimension of product safety regulation concerns the choice of design. A manufacturer may have a choice between producing the Risk Model and the Safe Model. Does strict liability encourage the manufacturer to make the optimal design choice? To examine this question, I will start with the ideal setting in which there are no administrative or legal costs, and courts are accurate.

a. Choice between Existing Designs

Presumably the manufacturer will choose the design that provides the greatest profit. In this framework, for any given quantity of the product demanded, the price of the risky model is just the sum of the price of the safe model and the incremental utility provided by the risky model, i.e., $price_{risk} = price_{safe} + U$. Given the assumption that production and marketing costs are the

[59] Polinsky and Shavell discuss ways in which consumers might become aware of product risks. See Polinsky & Shavell, *supra* note 1, at 1445-48.

[60] That is a big assumption. For serious injuries, most consumers would prefer to avoid the injury than to suffer it and receive compensation. *See* Dorfman, *supra* note 27, at 101-102.

[61] The reason is that the demand curve will shift down by an extent that reflects the consumer's expected uncompensated loss. This downward shift will offset the fact that the supply curve fails to reflect all of product-related costs. The amount consumed will remain the same as under full compensation.

same for the risky and safe products, in the absence of producer liability, the profit that a firm can earn by selling any given quantity of the risky product is greater than the profit it would earn from selling the same quantity of the safe product.[62] For example, if the price of the safe version is $1 and the incremental utility of the risky version is $1, the firm will make earn an additional $1 by selling one risky model rather than one safe model.

The profit per unit from selling the safe product is just the difference between the price of the safe product and its unit cost (average cost), i.e., $unit\ profit_{safe} = price_{safe} - unit\ cost.$ The profit per unit from selling the risky model, in the absence of liability, is the difference between the price of the risky product and its unit cost: $unit\ profit_{risk} = price_{risk} - unit\ cost$. If the consumer is uninformed as to product risk characteristics, the producer generally will prefer to sell the risky model because the profit per unit is higher for the risky model than for the safe model; specifically, $unit\ profit_{risk} - unit\ profit_{safe} = U.$

Under strict products liability, the risk cost is internalized to the producer, so that the unit profit of selling the risky model is reduced by the expected liability. Given this, the unit profit of the risky model seller is equal to the price less the sum of the unit cost and the unit liability; i.e., $unit\ profit_{risk} = price_{risk} - unit\ cost - R$. The per unit profit differential between the risky and safe model, under strict products liability, is $unit\ profit_{risk} - unit\ profit_{safe} = U - R.$

Thus, *under strict liability, the producer will choose the risky design if the incremental utility is greater than the incremental risk. It follows that strict products liability optimally regulates design choice*.[63]

The foregoing analysis of design incentives applies to the case in which the consumer is unaware of the product risks. *If consumers are aware of the product risks, then the producer will never have an incentive to choose a design for which the incremental risk exceeds the incremental utility, when there is a safer feasible alternative*. If consumers are aware of the risk, then the maximum possible price increase the producer can charge for the risky model is $U - R$. Given this, the producer will sell a risky model only when the incremental risk is less than the incremental utility.

The argument here assumes, as in the earlier presentation, that there are no administrative costs, that courts are perfectly accurate, and that there are no externalities that would distort the private incentives away from social incentives.

b. Innovation

[62] Specifically, the profit of the firm selling the risk model, in the absence of liability is $p_{risk}(q)q - c(q) = p_{safe}(q)q - c(q) + Uq.$ Thus, as long as $U > 0$, the firm can do at least as well, in the absence of products liability, by producing the risky product as it can by producing the safe product.

[63] The profit of the firm selling the risk model, under strict liability, can be written as $p_{risk}(q)q - c(q) - Rq = p_{safe}(q)q - c(q) + (U - R)q.$ Thus, as long as $U > R$, the firm can do at least as well by producing the risky product as it can by producing the safe product. Similarly, if $U < R$, the firm can do at least as well producing the safe product as it could by producing the risky product.

This analysis so far assumes that the producer chooses between two designs – the safe design or the risky design – without considering where these models come from. In the real world, someone has to innovate by creating the new risky design. Innovation is often costly.

First, assume, as in the previous examinations, that consumers are not fully informed as to product risk characteristics. The producer has a choice to produce the relatively safe product, or to innovate to produce the relatively risky product. How does strict liability affect incentives to innovate? Since, under strict liability, the producer will profit more from selling the relatively safe product when incremental risk exceeds incremental utility, strict liability will discourage innovation in the form of designs for which incremental risk exceeds incremental utility. This follows directly from the argument that strict liability optimally regulates design choice. If strict liability induces producers to make optimal choices between existing designs, it follows a fortiori, given that innovation is costly, that it discourages innovation of "net-negative utility products", i.e., products for which the incremental risk exceeds the incremental utility.

Consider net-positive utility products – that is, where incremental utility exceeds incremental risk. Strict liability encourages the choice of such a design if it already exists as an option to the safe design. However, if a firm spends resources in innovation to produce a new design, for which incremental utility exceeds incremental risk, the firm creates surplus for consumers that is not captured entirely in the product's price.[64] However, strict liability internalizes the injury risks introduced by the new product. The end result is that some of the benefits of innovation are externalized to consumers as a group, in the form of additional consumer surplus, while the new risk costs are fully internalized to the producer by liability. This implies that innovation incentives are not optimal under strict liability.

Of course, the innovation incentives generated by strict liability are no different from the case in which consumers are fully informed. If consumers are fully informed, the risk costs of the new product will be internalized to producers, in the form of lower bids for their products, while the consumer surplus from innovation is externalized.[65] It also follows from the foregoing that *if consumers are fully informed, no firm will invest resources in innovation to bring forth a new design for which the incremental risk exceeds incremental utility*.

C. Some Real-World Complications

I have so far focused on the short-run implications of strict products liability under ideal conditions in which administrative and litigation costs are zero, and courts make accurate

[64] However, if the firm can engage in perfect price discrimination by charging each consumer a price equal to the maximum the consumer is willing to pay, it will be able to capture all of the surplus that would have otherwise gone to consumers. In this special case, the incentive to innovate will be socially optimal – because the firm will be able to compare its innovation costs with the total social payoff from innovation. As long as the firm cannot engage in perfect price discrimination, it will not be able to capture all of the surplus going to consumers. To the extent that the innovating firm cannot capture all of the consumers' surplus, it externalizes part of the social payoff from innovation (to consumers). For a discussion of the economics of innovation, see JEAN TIROLE, THE THEORY OF INDUSTRIAL ORGANIZATION 390-393 (1989).

[65] Again, this statement assumes that the innovating firm cannot engage in perfect price discrimination. If the firm can engage in perfect price discrimination, then its incentive to innovate will be socially optimal in a market in which consumers have full information as to product risk and utility features.

decisions. I will expand the analysis in this part to consider long-run implications, and some real-world complications such as litigation costs and judicial error.

1. Consumption Effects

a. Long Run Versus Short Run

Strict liability, in a setting where consumers are uninformed as to product risks, is similar in effect to a tax on the manufacturer's product, where the tax is equal to the per-product insurance premium on a policy covering physical and property injury caused by the product. The preceding analysis showed that the market equilibrium changes, as a result of strict liability, to one in which the product price is higher and the quantity sold on the market lower. However, the price increase is not as large as the per-product injury cost (see Figure 2). In other words, the manufacturer's price rises, but not by the full extent of the "risk cost", which is equal to the insurance premium. This implies that in the short run, the costs of strict products liability are not passed on fully to the consumer; they are shared between the producer and the consumer.[66]

But this is only the short-run effect of strict products liability. *The output reduction effect of strict liability is larger in the long run than in the short run; and in the long run, the costs of strict products liability are passed on fully to the consumer*.[67] Why? Suppose the market was competitive before the imposition of strict liability, so that producers were just covering their costs initially. Since the price fails to rise, after the imposition of strict liability, by the full amount of the expected per-product injury loss, producers of the risky model cannot earn a competitive return as a group. Thus, some producers of the risky model will exit the market rather than continue to suffer economic losses, and as this occurs, total output falls further.[68] Producers will continue to exit the market until the price the remaining producers receive is sufficient to allow them to return to the competitive "normal profit" position (i.e., just covering opportunity costs of production and supply) that existed before the imposition of strict liability. That will require a smaller output than associated with the short-run equilibrium level, and a higher price. The long-run price level will be equal to the sum of the pre-liability unit cost of production and the per-product insurance premium.

b. Litigation Costs and Legal Error

As an insurance mechanism, strict products liability is inefficient in comparison to standard private insurance. In order to collect compensation, a claimant must go to court and argue his case before a judge, a procedure that surely would not be adopted internally within any insurance firm that hoped to survive in a competitive market. The cost imposed on the producer, therefore, is considerably greater than that of a per-product insurance premium, because it includes not only the cost of compensation but also the cost of a policy that pays for the producer's legal

[66] In general, the extent to which the costs are passed on the short run is a function of demand and supply elasticities. For an extensive examination of passing costs and legal rules, see Richard Craswell, *Passing on the Costs of Legal Rules: Efficiency and Distribution in Buyer-Seller Relationships*, 43 STAN. L. REV. 361 (1991).
[67] Buchanan, *supra* note 2, at 66-68.
[68] In terms of the supply and demand framework shown in Figure 2, the supply curve for the Risk Model will shift upward.

defense team. The per-product liability premium will also have to cover, in addition to legal expenses, the cost of potential nonpecuniary and punitive damages awards. Although punitive damages are rarely awarded, nonpecuniary awards are quite common and typically increase the total damage award by 100 percent (that is, nonpecuniary awards are roughly equal to the objective portion of damages).[69] Even if the producer were willing to concede liability, he might still need to employ a legal defense team in order to contest the plaintiff's damages claim.

Taking litigation costs (including possible nonpecuniary and punitive damage awards) into account leads to the conclusion that the output reduction effect of strict products liability is considerably larger than suggested in the previous discussion, even in the short run. It would not be unrealistic, for example, to assume that litigation costs increase the total per-product insurance premium by as much as 30 percent on average.[70] A study of the DPT vaccine, which vaccinates against diphtheria, pertussis (whooping cough), and tetanus, found that, in 1987, 96 percent of the vaccine's cost could be explained by the products liability cost premium.[71]

Of course, if consumers are risk averse, the mandatory insurance imposed by products liability could possibly enhance their welfare.[72] But the costs of litigation probably exceed the amount that any rational consumer would pay in the market for the insurance coverage mandated through products liability.

Legal error introduces another component in the producer's cost estimate. Strict liability does not apply to all instances of personal or property injury caused by a product; it does not apply to injuries that are classified as economic losses, and there are exemptions (such as the *Second*

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[69] Steven P. Croley & Jon D. Hanson, *The Nonpecuniary Costs of Accidents: Pain-and-Suffering Damages in Tort Law*, 108 HARV. L. REV. 1785, 1789 (1995).

[70] *See* James S. Kakalik & Nicholas M. Pace, *Costs and Compensation Paid in Tort Litigation*, (Rand 1986) on litigation costs, which shows defense costs are as much as 30 to 50 percent of compensation award. If the Rand results are reliable as averages, the compensation awards can be used to predict defense costs.

[71] *See* Richard L. Manning, *Changing Rules in Tort Law and the Market for Childhood Vaccine*, 37 J.L. & ECON. 247, 266 (1994). Manning notes that the vaccine, which was developed prior to the widespread adoption of products liability law, increased in price by 6,000 percent from 1970 to 1987, though the vaccine remained relatively unchanged from its original form. *Id.* at 248. For an analysis of how products liability law in the U.S. has affected the prices of popular prescription drugs relative to the prices of those same drugs sold in Canada (which employs a negligence standard, rather than strict liability, and in general has a less plaintiff-friendly environment in this area), see Richard L. Manning, *Products Liability and Prescription Drug Prices in Canada and the United States*, 40 J.L. & ECON. 203, 204-08 (1997). Manning argues that removing liability risk from the costs of 121 of the 200 most commonly prescribed drugs in the U.S., sold by the same manufacturer and under the same brand name in Canada, would reduce the overall mean price differential between the U.S. drugs and their cheaper Canadian counterparts by roughly half, from 69.7 to 35.5 percent (while the median price differential would drop from 43.6 percent to 32.6 percent). Manning takes into account the comment *k* exception, *see infra* note 65 and accompanying text, and still finds a large difference in U.S. and Canadian litigation costs.

[72] If consumers are risk averse, they would be willing to pay more than the actuarially fair premium for insurance against loss. The mere fact that the liability premium is greater than the actuarially fair insurance price does not imply that consumers are worse off, if they are risk averse. On risk aversion and litigation, see Jennifer H. Arlen, *Liability for Physical Injury When Injurers as Well as Victims Suffer Losses*, 8 J.L. ECON. & ORG. 411, 413-17 (1992) (providing an economic model for optimal levels of care and risk-spreading in pairs of risk-averse individuals); David Rosenberg, *Mandatory-Litigation Class Action: The Only Option for Mass Tort Cases*, 115 HARV. L. REV. 831, 854-57 (2001) (proposing optimal "tort insurance" for risk-averse individuals).

Restatement's comment *k* exception) covering certain products.[73] If courts are biased toward finding a product covered by the class to which the strict liability rule applies, legal error of this type would imply that the effective scope of strict liability is somewhat unpredictable.[74] This also implies that the overall output reduction effect could exceed the level suggested in the previous discussion.

Litigation costs have an impact on the consumer as well. Some injured consumers will forgo their right to sue because the cost of litigation exceeds the value of their claim for compensation. This offsets the litigation cost burden on producers, because some claims will go uncompensated.[75] But most cases involving product defects involve designs that can and inevitably will generate large damage claims, considerably greater than the cost to the victim of bringing a claim to court. The class action device allow attorneys to bundle and bring to court cases involve numerous small claims. Given this, the litigation cost burden is likely to increase the cost burden on producers, even after taking into account the rate at which claims are dropped or not pursued because of the litigation costs on the plaintiff's side.

c. Adverse Selection, Moral Hazard, and Correlated Claims

Since strict products liability operates as a coercive insurance mechanism we should not be surprised to find problems familiar in the insurance context appearing in this setting as well. Three important ones are adverse selection, moral hazard, and something I will refer to as the "cascading claims problem".

i. Adverse Selection

Adverse selection occurs when the risk characteristics of potential insurance customers vary in a manner that is unobservable to the insurer.[76] In this setting the insurer will offer a price for a given policy that is at least as large as the average cost for that policy. Since the terms are

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[73] RESTATEMENT (SECOND) OF TORTS § 402A cmt. k (1965). Comment *k* refers to "some products" generally, but to drugs specifically (such as the rabies vaccine), that "in the present state of human knowledge, are incapable of being made safe for their intended and ordinary use." Strict liability does not attach where such products are "properly prepared and marketed, and proper warning is given." In modern litigation, comment *k* is understood to apply to defective design claims. *See, e.g.*, Brown v. Superior Court, 751 P.2d 470, 477 (Cal. 1988) (holding that comment *k* applies to all "defectively designed" drugs); West v. Searle & Co., 806 S.W.2d 608, 613 (Ark. 1991) ("[B]y its terms, comment *k* exempts unavoidably unsafe products from strict liability only where the plaintiff alleges a design defect, but it does not offer protection from allegations of manufacturing flaws or inadequate warnings.").

[74] The scope of comment *k* is a perfect example of legal uncertainty under products liability law. Many states follow California's rule – adopted in Brown, 751 P.2d at 481-83 – that applies the comment *k* exemption to all prescription drugs. *See* James M. Beck, *Comment K, Some of the Way*, DRUG AND DEVICE LAW (April 28, 2011, 6:18 PM), http://druganddevicelaw.blogspot.com/2011/04/comment-k-some-of- way.html; James M. Beck, *Updates*, DRUG AND DEVICE LAW (Oct. 8, 2008, 2:50 PM), http://druganddevicelaw.blogspot.com/2008/10/updates.html. Beck has catalogued twenty jurisdictions (since updated to twenty-four, including several borderline cases) that have applied the comment *k* exception to *all* prescription medical products. In non-*Brown* states, the scope of the comment *k* exception is difficult to predict. *See* Beck, *supra*.

[75] On the implications of litigation costs in a regime of strict liability, see Keith N. Hylton, *The Influence of Litigation Costs on Deterrence Under Strict Liability and Under Negligence*, 10 International Review of Law and Economics 161 (1990).

[76] *See* KARL H. BORCH, ECONOMICS OF INSURANCE 317 (Knut K. Aase & Agnar Sandmo eds., 1990); George L. Priest, *The Antitrust Suits and the Public Understanding of Insurance*, 63, TUL. L. REV. 999, 1011 (1989).

unlikely to be attractive to low-risk customers – that is, customers who are unlikely to suffer an accident – they will tend to refuse the offer, and go without insurance (i.e., self-insure). However, the terms will be attractive to high-risk customers, who will flock to the offer. The insurer's *ex post* claims experience will, as a result, exceed the expected level. In response, the insurer may raise its price, but this will cause another round of exiting by relatively low-risk customers. Adverse selection leads to an unraveling of the insurance market, where in the limit self-insurance is the only option.[77]

This process could occur in the product market setting as well, under a regime of strict products liability.[78] Suppose the set of product consumers consists of low-risk consumers, who because of their carefulness are unlikely to suffer an injury from using the product, and high-risk customers, who because of their carelessness are likely to suffer an injury from using the product. When the producer adds an insurance premium to the price, that premium will be based on an estimate of the average expected claim. Since the average among low-risk customers is lower than the population average of the product's consumers, the low-risk consumers will find the insurance premium excessive, and may prefer a relatively safe alternative product, or perhaps to do without the product at all. This implies that the manufacturer will be left with a relatively risky group of customers, which requires an increase in the premium. In the limit, the insurance premium will have to be raised to the level necessary to provide insurance for the highest risk class of consumers. The output reducing effect of strict products liability will be substantially greater than in the simple analysis presented earlier.

Consider, for example, circular power saws. Some users will be very careful with them; some will not. The careful users will tend to read the safety instructions and follow them. The less careful users will disregard the safety instructions. One fairly common way of disregarding the safety instructions is to remove the blade guard, in order to enhance the maneuverability of the saw. However, in some cases, removing the blade guard can be quite dangerous.[79] If the producer were liable for all injuries to both the careful and non-careful consumers, the liability premium attached to the price of circular saws would be quite high, and could exceed the maximum price that many potential users would be willing to pay.

ii. Moral Hazard

Closely connected to the problem of adverse selection is moral hazard. The term refers to the insurance customer's change in conduct *after* he has entered into the insurance agreement.[80] For

[77] *See* Priest, *supra* note 76, at 1011.
[78] *See* George L. Priest, *The Current Insurance Crisis and Modern Tort Law*, 96 YALE L.J. 1521, 1564 (1987) ("Those consumers who use products in typically less, rather than more, risky ways are likely to drop out of the consumer pool if tort law requires the manufacturer to insure all consumer uses."); Richard A. Epstein, *Products Liability as an Insurance Market*, 14 J. LEGAL STUD. 645, 667-68 (1985). Epstein argues that adverse selection, while relatively diminished in the commercial car insurance industry due to the customizable nature of insurance coverage, occurs in the mandatory insurance tied to car sales under a strict products liability regime, because manufacturers "cannot differentiate between the retiree who drives 5,000 miles a year and the commercial traveler who drives 150,000 miles . . . ."
[79] Hood v. Ryobi America Corp., 181 F.3d 608 (4th Cir. 1999).
[80] *See* Borch, *supra* note 76, at 317.

example, a car owner who is fully insured against loss may take less care to prevent car theft. This change in behavior, induced by insurance, leads to an increase in the probability of a claim.

Moral hazard may be observed in the products liability context. The likelihood of being harmed by a product is in many instances a function of the product user's conduct. Insurance may weaken the incentives of the user to take care to avoid injury. Admittedly the argument sounds weak in the case where the product user faces a risk of personal injury. Few product users would allow themselves to suffer a significant injury merely because they knew they could be compensated by the manufacturer.[81] However, there are instances in which product-related insurance may alter the behavior of the consumer/user. A consumer may think that the likelihood of personal injury for a certain product is extremely low, while the probability of property injury is high. Given that the product involves a tradeoff between different types of property, one accompanied by liability insurance and the other not, the consumer may have a weaker incentive to take care to avoid property injury caused by the product that is accompanied by liability insurance. Suppose, to take a concrete example, a consumer purchases a light bulb for a shed that stores old yard equipment. The consumer discovers that the light bulb has a relatively high risk of catching fire. He may choose to go ahead and install the dangerous light bulb, rather than discard it and purchase a new one, if he knows that liability insurance will cover the property loss due to the faulty light bulb.

Moral hazard can be present in personal injury settings too. Consider the case of a printing press operator who has to choose how much to invest in safety training (operational safety) or in equipment to reduce the risk of employees getting their clothing or body parts trapped in the printing machine. The operator may invest less in the safety of his operations, aware that an employee who gets his hand caught in a machine is likely to sue the machine manufacturer rather than pursue a workers' compensation claim.[82]

Of course, this is not all there is to the matter. Perhaps it is cheaper for the machine manufacturer to install safety equipment than for the operator to enhance the safety of his operation. If this is so, the market will result in operators purchasing the level of safety they desire in the machine. Those who can provide safety cheaply will purchase relatively dangerous machines and invest in the additional operational safety on their own. But they may choose not to do so if they find that they can save even more money by relying on the implicit insurance provided by the law.

Moral hazard results in a claims experience that is greater than anticipated by the product manufacturer. This exacerbates the output reduction effect of strict products liability.

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[81] Dorfman, *supra* note 27, at 101-102.

[82] *See* Caroline Mitchell, *Products Liability, Workmen's Compensation and the Industrial Accident*, 14 DUQ. L. REV. 349, 370 (1976) (explaining that because recovery under workmen's compensation is limited by statute, an employee will choose to sue the manufacturer, because full compensation is possible under this option). *See also* Liriano v. Hobart Corp., 170 F.3d 264, 266 (2d Cir. 1999) (Calabresi, J.) (affirming partial judgment against meat grinder manufacturer whom grocery store employee successfully sued, on the basis of failure-to-warn liability, after injuring his hand in a meat grinder, though only after his employer, who was also found liable, had removed the safety guard); Micallef v. Miehle Co., 39 N.Y.2d 376, 387-88 (1976) (adopting strict products liability in case where printing-press operator sued manufacturer, under negligence in design and breach of warranty theories, after injuring hand while performing dangerous maneuver assented to by employer).

iii. Correlated and Cascading Claims

Insurance is difficult to offer when claims are positively correlated.[83] In the standard life or health insurance setting we typically do not see positively correlated claims. The likelihood of one insurance customer dying from a heart attack does not influence the likelihood that another customer will die from a similar event. By holding a large portfolio of potential claims, the insurer can virtually eliminate uncertainty connected to the expected payment of claims within a fixed time period.

When claims are positively correlated, however, the insurer cannot virtually eliminate uncertainty with respect to expected payouts by holding a large portfolio. This is a phenomenon we observe in the case of natural disasters, such as earthquakes and hurricanes. If one person claims, we are likely to see hundreds of others claiming.

Insurance is not impossible in the context of correlated claims. We observe earthquake and hurricane insurance. However, because of special difficulties in these markets, we often see state mandates requiring that the insurance be offered, and sometimes state subsidies to encourage customers to purchase the insurance.[84]

The claims experiences connected to various products differ. With respect to most products on the market, we are unlikely to see positively correlated claims. However, with respect to some products, we should anticipate positive correlation. For example, products that affect health and the environment are likely to generate positively correlated claims. The asbestos cases and the silicone implant cases provide examples. Asbestos claims have flooded the courts over the past 30 years.[85] Once established as presenting a health risk, asbestos generated an avalanche of products liability claims. Similarly, silicone implants generated an avalanche of claims.[86] However, the scientific evidence of causation has never been established with respect to silicone implants.[87] The silicone claims appear to have been strategic efforts by plaintiffs to gain compensation for illnesses unconnected to silicone implants.

I prefer to think of the silicone implant example as one of *cascading claims* rather than correlated claims. I use the term cascade here to refer to a process in which a legal theory is adopted successively by actors who have rational bases to do so. In the silicone context, the scientific causation evidence suggests that the avalanche of claims was the result of a concerted effort to

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[83] Priest, *supra* note 76, at 1011 (arguing that, in such cases, "there is no comparative advantage to market insurance over self-insurance").

[84] For example, California law requires insurance companies offering residential property insurance to provide residents earthquake insurance. *See* California Earthquake Authority, *About Earthquake Insurance*, *available at:* http://www.earthquakeauthority.com/index.aspx?id=13 (last visited Feb. 21, 2012).

[85] STEPHEN J. CARROLL ET AL., ASBESTOS LITIGATION xxiv-xxv, 1 (2005), *available at* http://www.rand.org/pubs/ monographs/ 2005/RAND_MG162.pdf. (finding 20,000 individuals had filed asbestos claims by the early 1980s and 730,000 individuals had filed such claims through 2002).

[86] John C. Coffee, Jr., *Class Wars: The Dilemma of the Mass Tort Class Action*, 95 COLUM. L. REV. 1343, 1408 (1995) (describing the *Silicone Gel* class action settlement in which more than 430,000 individuals filed claims); In re Dow Corning Corp., 86 F.3d 482, 485-86 (6th Cir. 1996) (flood of silicone breast implant claims forced Dow Corning into bankruptcy).

[87] David E. Bernstein, *The Breast Implant Fiasco*, 87 CALIF. L. REV. 457, 477-84 (1999).

create a pool of funds for the purpose of compensating claimants and lawyers. The heart of the process is an information cascade rather than a natural disaster generating positively correlated injury claims.[88] In the information cascade process, one lawyer or group of lawyers proposes a theory of injury causation, which is passed on to other lawyers and widely advertised to the public. Lawyers have incentives to join the cascade, even if they privately doubt the underlying causal theory. The reason is that as more claims join the cascade, the greater the probability that the target will be forced to settle rather than fight all of the claims in court. Thus, cascading claims generate a self-fulfilling prophecy.

The correlated and cascading claims scenarios imply that the output reduction effect of strict products liability can be substantially larger than anticipated. Like adverse selection, this is a case in which the output reduction effect can reach such a level that the product cannot be offered. This is perhaps not a troubling result in the case of some products, such as asbestos, where the harms are generally well understood in terms of causation principles.[89] It is a troubling result, however, in the cases where plaintiffs' causal theories are invalid or unsupported by science.

2. Design Choice Effects

The discussion in Part III.B.2.b of the design choice implications of strict products liability assumed, as did the initial presentation of consumption effects, that there are no litigation costs, and that courts are perfectly accurate as well as predictable. If courts are not accurate and if litigation costs are substantial, there is no guarantee that strict products liability will optimally regulate the design choice decision. The liability system may "over-internalize" or "under-internalize" injury costs to the producer, depending on whether damages typically exceed the cost of bringing a claim to court. In other words, products liability may tax the producer by an amount that exceeds the expected value of the injury risks it creates, or by an amount that is less than the value of the risks it creates. Since products liability damages are likely to exceed the cost of bringing a claim to court, and given the active class action practice in products liability,[90] the more plausible result is over-internalization of risk costs to the producer.

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[88] On information cascades generally, see Sushil Bikhchandani, David Hirshleifer, & Ivo Welch, *A Theory of Fads, Fashion, Custom, and Cultural Change as Informational Cascades*, 100 J. POL. ECON. 992 (1992). The theory of information cascades has been applied mostly in the area of finance, *see* David S. Scharfstein & Jeremy C. Stein, *Herd Behavior and Investment,* 80 AM. ECON. REV. 465 (1990). However, it clearly applies to the development of class actions. The only application of cascade theory to litigation examines possible cascades, within the common law, based on precedent, *see* Eric Talley, *Precedential Cascades: An Appraisal*, 73 S. CAL. L. REV. 87 (1999).

[89] Even in the case of asbestos there is a question as to the availability of adequate alternatives. Asbestos has served as a fire retardant for centuries, and could very well have prevented many more injuries than it has caused – most people would prefer reduced lung function to death in a fire. *See* Keith N. Hylton, *Asbestos and Mass Torts with Fraudulent Victims*, 37 SW. U. L. REV. 575, 578-79 (2008).

[90] *See* Deborah R. Hensler, *Has the Fat Lady Sung? The Future of Mass Toxic Torts,* 26 REV. LITIG. 883 (2007). Hensler reviews multi-distrist litigation data and finds a dramatic increase in class action activity in products liability over the 1990s and through 2006. *See id.* at 907. Hensler also reviews law firm activity—filings, industry reports, and advertisements—and concludes that the mass tort practice remains "vibrant." *See id.* at 921-22. *See also* Lester Brickman, *The Use of Litigation Screenings in Mass Torts: A Formula for Fraud?*, 61 S.M.U. L. REV. 1221, 1223 & nn.1-5 (noting that mass tort litigation, which Brickma defines as claims by large numbers of people who have ingested, inhaled, or implanted a product into their body that is harmful, is "often in the form of a class action, mass consolidation, or other aggregate form, but also may simply involve thousands of substantially similar individual claims."). *But cf.* Jessee Tiko Smallwood, *Nationwide, State Law Class Actions and the Beauty of*

In addition, the insurance market inefficiencies discussed earlier could easily lead to inefficient regulatory outcomes. If adverse selection occurs in the market for the risky product, leading to excessive purchases by high-risk consumers, the liability system will internalize to the producer costs that exceed the expected risk costs based on the entire population of consumers. As a consequence, the costs shifted to producers as a result of products liability may be significantly larger than the real risk costs generated by the products.

On the assumption that liability costs to producers over-internalize the risk-related costs, products liability law will not optimally regulate the design choice. Since the risk cost internalized to the producer is likely to exceed the injury risk to the consumer, producers will be excessively reluctant to adopt net-positive utility designs that entail additional risk to consumers.

Now consider innovation, under the assumption that liability over-internalizes risk costs to producers. I noted earlier, in the analysis under ideal conditions (no litigation costs, uncertainty, etc.), that strict products liability failed to provide optimal innovation incentives, but that the liability rule did not alter the outcome that would be observed in a full-information market. With litigation costs taken into account, strict products liability exacerbates the divergence between the private and social incentive to innovate. Relative to a market in which consumers are fully informed, products liability excessively discourages innovation.

D. Effects of Legal Tests

The preceding discussion examined the effects of liability under a very simple rule of strict or absolute liability. Of course, the law has not generally adopted such a test – the closest the law comes to it is the strict liability rule that applies to manufacturing defects. The general tests adopted in the law are the consumer expectations test and the risk-utility test. In this part I will examine the incentive effects of these tests, taking advantage of the arguments developed in the foregoing analysis of the strict producer liability rule.

1. Consumer Expectations Test

a. Consumption and Design Incentives

Although the preceding analysis examined a simple version of strict liability, the analysis explains the effects of the consumer expectations test, the first test for liability proposed in the *Restatement (Second) of Torts*.[91] Under the consumer expectations test, the manufacturer is strictly liable for defective conditions of which the consumer is unaware, and is not liable when the consumer is fully aware of the defective conditions.[92] The consumer expectations test is an especially refined form of strict producer liability that imposes liability when consumers are uninformed and provides immunity from liability when consumers are informed.

Federalism, 53 DUKE L.J. 1137, 1156 & nn.116-18 (2003) (noting a trend away from products liability class actions being heard in federal courts, and a simultaneous move to state courts, following the heightened standard for settlement classes announced in *Amchem Prods., Inc. v. Windsor*, 521 U.S. 591 (1997)).

[91] RESTATEMENT (SECOND) OF TORTS, § 402A (1965).

[92] *Id*.

Based on the preceding analysis, and all of its simplifying assumptions, *the consumer expectations test is an optimal rule for regulating consumption decisions*. The rule internalizes the costs of injury risk to manufacturers when consumers are not aware of them, and this leads to optimal production decisions. On the other hand, when consumers are fully aware of the risk costs, the consumer expectations test leaves them to suffer the costs of their decisions, which leads to optimal consumption choices. As the preceding analysis indicates, optimal consumption patterns result from the consumer expectations test.

As for product design decisions, the preceding analysis implies, again, that the consumer expectations test provides an optimal regulatory framework, in the sense that the test leads the producer to choose the risky design when and only when the incremental utility from the risky design is greater than its incremental risk. If the incremental risk exceeds the incremental utility, and consumers are uninformed, the liability imposed under the consumer expectations test would induce the manufacturer to choose the safe design instead of the risky design. If the incremental risk is less than the incremental utility, and consumers are uninformed, the liability imposed under the consumer expectations test would not alter the manufacturer's preference for the risky design. If consumers are informed, the consumer expectations test permits the market to regulate design choice, which is preferable in that case.

The consumer expectations test's only potential flaw becomes apparent when we consider innovation. Although the test appears to lead to optimal choices between two existing product designs, it replicates the market's incentives when it comes to innovation of new product designs that improve consumer welfare.

b. Real-World Complications: Consumer Expectations Test

As commentators have noted, there are practical problems in implementing a consumer expectations test.[93] Some consumers may be fully aware of the risks while other consumers are not. Whose awareness level should the consumer expectations test incorporate? My analysis to this point does not address these practical issues. I have considered an ideal setting in which the consumer expectations test can be applied with perfect accuracy and without administrative costs. Under such a setting, the test leads to optimal consumption patterns in the market and in optimal design decisions by manufacturers.

Once practical implementation issues are taken into account, the effects of the consumer expectations test on consumption and design choices are quite unlikely to be optimal. The first set of practical issues involves the administrative costs and insurance market inefficiencies surveyed earlier. When these factors are taken into account, the market-shrinking effect of strict liability will be far greater than predicted under an analysis that ignores these costs. The cascading-claims problem discussed earlier would be sufficient to severely restrict the scope of a market under strict, consumer-expectations based, products liability.

The second set of practical issues involves the problem of *inherent and unobservable risk*. For modern complex products, such as the automobile, there are bound to be many features that can

[93] Henderson & Twerski, *supra* note 40, at 879-882, 904.

be viewed as creating or imposing risk on the consumer that the consumer will not be able to assess before purchase. Each of these features could form the basis of a products liability lawsuit grounded in the consumer expectations theory. Because the existence of such features is virtually unavoidable from the manufacturer's perspective, the consumer expectations test effectively converts the manufacturer into an insurer. In spite of the appearance of a safe harbor based on the obviousness of risk, the consumer expectations test operates in effect as strict liability.

To provide a concrete example of the problem of inherent and unobservable risk, consider the choice between the X-frame and box-frame cars.[94] The X-frame car is designed to crumple inward in response to a side collision. The crumpling inward of the car body absorbs some of the force of the collision, and in this sense reduces the risk of a more severe injury to the driver. However, some injured consumers have brought products liability lawsuits on the theory that the X-frame car is defectively designed – precisely because it crumples inward. The alternative to the X-frame is the box-frame, which in theory protects the driver by reducing the likelihood that the car body will crumple inward. But the box-frame introduces it own dangers. The force of a blow is more likely to be transmitted directly to the people inside the car, causing them to shift position violently. Injuries can result to the driver or passenger from being thrown against the windshield or side of the car.

Given these descriptions, both the X-frame and box-frame could be treated as dangerous features whose risks are not obvious to the consumer. In other words, both frames violate the consumer expectations test, and both designs would justify damage awards under the test. But if both frames would subject the manufacturer to liability on the basis of consumer expectations, how can the manufacturer choose which design is optimal?

One could argue that litigation experience should guide the manufacturer to the optimal design. The manufacturer will pay more in damages for the design that leads to the most injuries. But this is extremely wishful thinking in connection to the litigation process. The relative numbers of claims may not precisely track the relative risks of each design within any given time period. Moreover, the chosen frame design may be necessary to reduce or offset some other feature that might be viewed as a source of risk.

The tradeoff problem posed by the choice between the X-frame and box-frame is probably replicated over many other features of a car design. Given the existence of many features that could be viewed as sources of unobservable risk, the consumer expectations test would be unlikely to send carefully calibrated signals guiding the manufacturer toward the optimal tradeoff between safety and utility.

Henderson and Twerski argue that the scope of the consumer expectations test is unclear, because there may be cases in which the expectation of the ordinary consumer cannot be discerned easily, or, even if discernible, may be irrelevant to the regulatory issues at hand.[95]

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[94] *See* Dawson v. Chrysler Corp., 630 F.2d 950 (3d Cir. 1980); *infra* text accompanying note 124.

[95] Henderson & Twerski, *supra* note 40, at 880-881. For example, suppose a design change that reduces one risk enhances a different risk. How should courts resolve the conflict between expectations? What if some consumers are risk-neutral and others are risk-averse? What if consumers are not aware of the technological alternatives, so

Henderson and Twerski's argument suggests that the uncertainty is more troubling because of the difficulty that a firm would find in predicting outcomes under the test. The consumer expectations test depends on a determination – specifically, the expectation of the consumer – that the producer may not be able to predict with any reasonable degree of accuracy at the time of production.

However, I think the core problem is not that the scope of the consumer expectations test is unclear. The scope might be unclear at an early phase of its application, but over time its implications would become clear. The greater problem is that the scope of liability under the consumer expectations test is unbounded in connection with products that have complex designs. The manufacturer could not design around the problem of inherent and unobservable risk. Hence, the consumer expectations test would operate effectively as strict liability.

When the practical implementation issues are brought into view, it is not clear, even in theory, that the consumer expectations test will generate optimal consumption levels. The social desirability of a consumer expectations-based products liability test is ultimately an empirical question.

2. Risk-Utility Test

Courts have generally embraced the risk-utility test in product design challenges. In this part I will examine the effects of the risk-utility test on consumption, precaution in design, and innovation. Consistent with the previous analysis I will start with the assumption that the test is implemented flawlessly by courts that operate with perfect accuracy. Practical questions about implementation and error will be considered only after examining the test under ideal conditions.

a. Consumption Effects of the Risk-Utility Test

Unlike the consumer expectations test (examined under ideal conditions), the risk-utility *does not* (examined under ideal conditions) generate optimal consumption levels when consumers are uninformed as to the product risks.

The risk-utility test deems a product defective in design if the additional risks imposed by the design, compared to a safer alternative,[96] are not *reasonable* in light of the additional utility of the challenged design.[97] The risk-utility test envisions a comparison between the challenged design and some comparatively safe alternative. The court compares the incremental risk characteristics of the challenged design to those of the alternative. Using the terms defined previously, the product is unreasonably defective if and only if $R > U$.

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that their expectations have no bearing on the feasible set of solutions to the design safety problem? These are just a few of the excellent questions Henderson and Twerski raise in connection with the consumer expectations test. One could add more issues. For example, as the set of consumers change over time, how can a manufacturer predict and conform to expectations? What if consumers claim to have had their expectations distorted by advertising? *See* Williams v. Philip Morris, Inc., 127 P.3d 1165, 1168-70 (Ore. 2006); Garrison v. Heublein, Inc., 673 F.2d 189, 189 (7th Cir. 1982).

[96] For a discussion emphasizing the role of the safer alternative, *see* Henderson & Twerski, *supra* note 40, at 882-87.

[97] *See* Owen, *supra* note 41, at 524-31.

Return to the car design choice discussed previously. Assume consumers are fully aware of the risk characteristics of the product, and can observe the utility characteristics as well. Suppose, in addition, that the incremental risk exceeds the incremental utility, for the risky design. The risk-utility test will require the imposition of liability on the manufacturer. As we saw in the previous discussion, when consumers are fully aware of the product's risks, imposing liability does not alter the market equilibrium quantity that emerges in the absence of liability. The only effect of strict liability is to raise the price to reflect the forced sale of an insurance policy. *Thus, under the risk-utility test, with informed consumers, the market equilibrium consumption level will be optimal*.

Now suppose consumers are unaware of the risk characteristics of the product, though they can observe the utility characteristics. Suppose also that incremental risk exceeds incremental utility ($R > U$). Since consumers can observe the additional utility of the risky product, their demand for the risky product will reflect this additional expected utility. In the absence of producer liability, the market would result in excessive consumption.[98] Under the risk-utility test the seller will be held liable in this example because incremental risk exceeds incremental utility. The resulting market equilibrium generates the optimal consumption level because the injury costs associated with the product, which are unknown to consumers, are internalized to the producer.[99] Strict liability, imposed under the risk-utility test, achieves the goal of reducing consumption of the risky product to the optimal level.

Now let us consider the case where the incremental risk is less than the incremental utility, i.e., $R < U$, as shown in Figure 4. The seller will not be liable under the risk-utility test. As we have seen, that does not alter the market outcome when consumers are fully aware of the product's risk characteristics. However, if consumers are not aware of the product's risk features, the market equilibrium generates an excessive level of consumption – because consumers are unaware of the product's risks and the risks are not internalized to the producer. By exempting the seller from liability, the risk-utility test results in over-consumption of the risky product when incremental utility exceeds incremental risk. In Figure 4, the consumption level is associated with point *A'*, which is greater than the optimal consumption level associated with point *B*.

[98] Specifically, since the seller is not liable, the market equilibrium will be determined by the intersection of the safe seller's supply curve and the demand curve for the risky product (see Figure 2, point *A*).
[99] Figure 2, point *B*

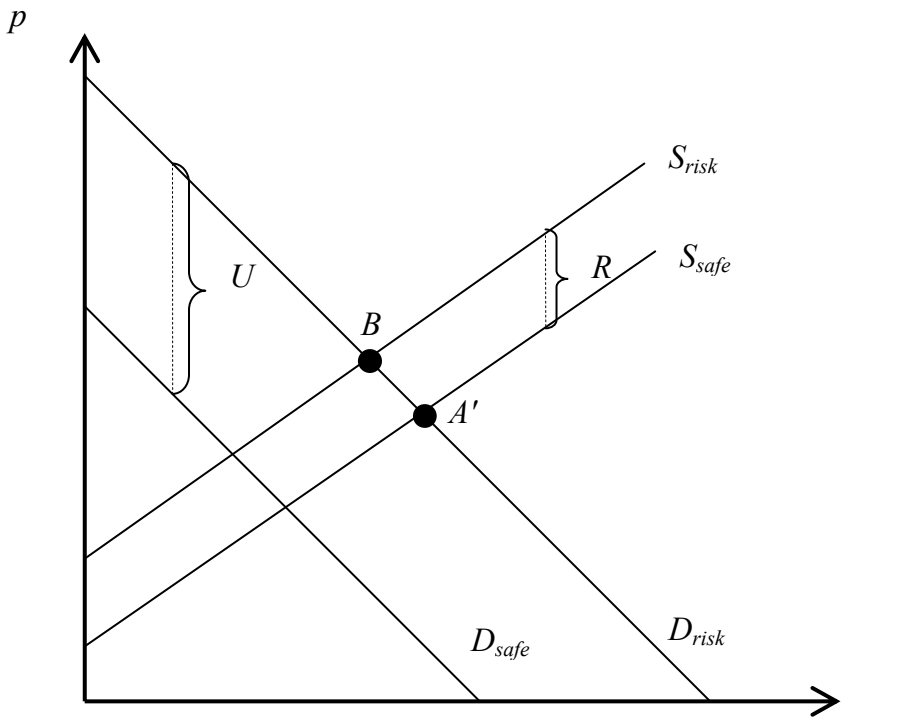

Figure 4: $R < U$

The upshot of this analysis is that under ideal conditions – no litigation costs, no insurance-market inefficiencies, perfectly accurate courts – *the consumption effects of the risk-utility test depend on whether the incremental risk associated with the product is greater or less than the incremental utility. If the risk is greater than the utility, the test generates optimal consumption levels. If the risk is less than the utility, the test leads to over-consumption of risky products*.

b. Design Choice Effects of the Risk-Utility Test

In this part I will consider product design decisions under the risk-utility test. Recall that under strict products liability, the unit profit differential between the risky and safe model, assuming the producer chooses the same quantity, is equal to the difference between the incremental utility and the incremental risk, $U - R$. It should be clear that when the incremental risk exceeds the incremental utility, liability will discourage the producer from choosing the risky design. His profit is potentially greater if he chooses the safe design.

When the incremental risk of a new product design is less than the incremental utility, the risk-utility test imposes no liability on the producer who chooses to sell the risky product. Thus, when the risk is less than the utility, the unit profit differential between the risk and safe models is equal to the incremental utility.

It follows that the risk-utility test, like the consumer expectations test, always encourages the seller to make optimal design choices, in the sense of inducing the producer to choose the safe product whenever incremental risk exceeds incremental utility, and to choose the risky product when its incremental utility exceeds its incremental risk. The difference between the risk-utility test and the consumer expectations test is that the risk-utility test allows the producer to retain a larger profit when he chooses to design new products that impose some risk on consumers, whenever the incremental risk is less than the incremental utility. In other words, the risk-utility test encourages innovation toward net-positive utility designs, by spreading the payoffs to the producer between the net-positive utility and net-negative utility designs.

The effective subsidy in the direction of net-positive utility designs is potentially optimal in light of the gap between private and social incentives to innovate discussed in Part III.B.2.b. Innovation provides a positive externality, from the perspective of the innovator, in the form of new surplus to consumers. By completely eliminating liability for designs for which incremental utility exceeds incremental risk, the risk-utility test provides a subsidy that encourages welfare-enhancing product innovation, potentially moving it closer to the optimal rate.

3. Real-World Complications

The foregoing analysis of the risk-utility test has assumed ideal conditions: no judicial error, no administrative or litigation costs, no insurance market inefficiencies. It suggests that the risk-utility test is inferior to the consumer expectations test in terms of its effects on consumption. The consumer expectations test leads to optimal consumption levels generally while the risk-utility test generates optimal consumption levels only when incremental risk exceeds incremental utility, and excessive consumption when incremental risk is less than incremental utility. In terms of effects on product design incentives, the two tests are equivalent in their effects on the incentive to choose between two existing designs. The risk-utility test is potentially superior to the consumer expectations test in terms of its effects on product design innovation.

In this part I will complicate the analysis by taking some real-world matters into account. I will consider the consumption effects of the risk-utility test when legal process is costly and courts make mistakes. Then I will examine design choice effects of the risk-utility test.

a. Consumption Effects, Risk-Utility, with Error and Costs

First, consider the effects of administrative costs and uncertain application of the law on consumption patterns. These factors suggest that the market shrinking effect of producer liability will be greater than predicted under the ideal conditions analysis that assumed no litigation costs or judicial error. For designs in which the incremental risk exceeds the incremental utility, the costs of litigation and of uncertainty will push consumption levels below the optimal level. For designs in which the incremental risk is less than the incremental utility – where the legal test would exempt firms from liability if the law were applied without error – the presence of a significant risk of liability due to error will lead to a corresponding increase in price and reduction in consumption. Whether there would be over-consumption, as predicted in the ideal conditions scenario (Figure 4), or under-consumption is an empirical question. Under-

consumption could result if the sum of the costs of litigation and expected liability due to error exceeds the injury costs of the risky design.

b. Design Incentives, Risk-Utility, with Error and Costs

Now consider product design decisions under the risk-utility test. In the ideal conditions setting (no litigation costs, and no uncertainty in the test's application), the risk-utility test encourages innovation toward safer designs. With litigation costs and uncertainty taken into account, the subsidy toward relatively safe innovation is probably less generous, though still present.

Litigation costs will burden both net-positive utility designs (i.e., for which incremental utility exceeds incremental risk) and net-negative utility designs. However, as long as plaintiffs are more likely to sue the sellers of net-negative utility designs, which is a reasonable assumption, litigation costs will tend to be a greater burden for sellers of net-negative utility designs. This implies that even with litigation costs taken into account, the risk-utility test's subsidy for safety innovation remains.

The effects of uncertainty on design incentives are more complicated. In the presence of uncertainty as to its application, the risk-utility test probably gives producers an incentive to err toward high net-positive utility designs. The effect of the risk-utility test is to encourage excessive investment in reducing risk in the region of designs that generate the most uncertainty regarding the outcome of the legal test. In other words, if a manufacturer is considering a design for which the court's likely assessment of the balance between incremental risk and incremental utility is unclear, the manufacturer is likely to have an incentive under the test to err toward safety. This is analogous to the proposition, first offered by Mark Grady,[100] that the negligence test, in the absence of a rigorous causation inquiry, encourages excessive investment in precaution when the actor's level of precaution is a range in which the outcome of the negligence test is uncertain. The reason the negligence test leads to socially excessive precaution is because, as Grady noted, there is a discontinuous jump in liability once the actor crosses the negligence threshold. The same argument applies to the risk-utility test in the products liability setting. When the producer is in the region of product design space where the outcome of the liability test is uncertain, the producer would experience a discontinuous jump in liability risk as he crosses the threshold for liability – unless courts are rigorous and accurate in their analysis of causation. As a result, the risk-utility test, in the presence of uncertainty as to its application, is likely to provide a strong inducement toward maximizing the differential between incremental utility and incremental risk.[101]

However, if the risk of erroneous findings of liability is sufficiently great, the risk-utility test could have the perverse incentive of inducing producers to abandon designs that impose additional risk on consumers, irrespective of the differential between incremental utility and

[100] Mark F. Grady, *A New Positive Economic Theory of Negligence*, 92 YALE L.J. 799 (1983).

[101] Under Grady's analysis, if courts are accurate in their application of causation analysis, the inducement toward excessive precaution in design will not be observed. Design incentives will be optimal. The inducement toward excessive precaution depends on the presence of uncertainty in the application of the legal standard and a failure of courts to reliably and accurately apply causation principles. My argument in this part of the text assumes that courts will not be perfect in applying causation principles; and because of this imperfection, there will be some inducement toward excessive precaution.

incremental risk. Suppose the producer fears that it cannot escape the burden of liability by increasing the differential between incremental utility and incremental risk. In this worst-case scenario, the producer may choose to abandon innovation rather than attempt to aim for a high net-positive utility design.

This suggests that in the presence of uncertainty over the application of the risk-utility test, one should observe different effects of the test. The test alters incentives for a special type of precaution (specifically, aiming for high net-positive utility designs) in the design process, but it also affects incentives to engage in the activity of design (that is, innovation). If the likelihood of an erroneous finding of liability is relatively low, the precaution effect should predominate, generating a push toward high value designs. If the uncertainty is relatively high, the activity effect should predominate, discouraging design efforts altogether.

This is consistent with the analysis of legal uncertainty by Richard Craswell and John Calfee.[102] In examining the effects of uncertainty with respect to the due-care standard in the application of a legal test, Craswell and Calfee find that low levels of uncertainty resulted in excessive precaution, while high levels of uncertainty resulted in inadequate precaution. The intuitive reason is that with low levels of uncertainty, the punishing effect of crossing the legal threshold forces the actor to take excessive care – which is the effect identified by Mark Grady. With high levels of uncertainty, the actor is punished whether he complies with the law or not, and so takes less care. In the case of products liability, high levels of uncertainty are likely to be met with withdrawal from the product innovation process.

IV. Remaining Topics: Manufacturing Defects, Failure-to-Warn Claims

I have to this point focused on design defect claims. I consider this a reasonable allocation of attention, since the other major areas of modern products liability litigation are far less controversial. The other major areas are manufacturing defect litigation and failure-to-warn litigation.

A. Manufacturing Defects

Recall that manufacturing defects refer to products that deviate from the manufacturer's design or from the standard result of the manufacturing process. In other words, they are the infrequent glitches that come out of the manufacturing process. When the glitch is one that presents a risk of harm to the consumer, then the manufacturer is held strictly liable for the injury to the consumer. For example, suppose a plastic soft drink bottle has a glitch in the form of a stray jagged piece of plastic jutting out from the side. If a consumer cuts his hand on the stray piece of plastic, he can bring a strict liability claim against the bottle maker.

In the absence of strict liability for manufacturing defects, manufacturers could be held liable for such defects only on the basis of negligence. In many cases, courts would find manufacturers liable on the basis of *res ipsa loquitur* doctrine. However, consumers may not be able to take advantage of *res ipsa loquitur* in every case involving a manufacturing defect. Courts might find

[102] John E. Calfee & Richard Craswell, *Some Effects of Uncertainty on Compliance with Legal Standards*, 70 VA. L. REV. 965, 974-984 (1984).

that the conditions necessary for the *res ipsa* doctrine to apply are not satisfied in some manufacturing defect cases – for example, a court might conclude the failure of some component could easily occur in the absence of the manufacturer's negligence. In addition, courts might find that the manufacturer's production process incorporates reasonable precaution, and on that ground refuse to find the manufacturer negligent. This is an especially likely outcome as manufacturing processes become more efficient over time. Consequently, applying the negligence rule to manufacturing defect cases would not be equivalent to applying strict liability. This implies that the liability burden on the manufacturer would be lighter under the negligence rule than under strict liability.

The arguments provided in the previous parts of this paper apply readily to the manufacturing defect cases. If consumers are unaware of the likelihood of being injured by a manufacturing defect, then strict liability will result in a market consumption level that is optimal, under ideal conditions (i.e., in the absence of substantial litigation costs and insurance-market inefficiencies). Manufacturing defect liability can be viewed as a special case of the consumer expectations test that is applied in a setting in which consumers are unlikely to be aware of the risk. However, if consumers are aware of the precise risk of confronting a manufacturing defect in a particular product, then strict liability would serve only to impose a costly and inefficient form of insurance onto the market. Thus, under the ideal conditions, strict liability is preferable to negligence where consumers are unaware of the risk of a defective condition. Negligence is preferable to strict liability when consumers know the precise risk of a defective condition.

When litigation costs and insurance-market inefficiencies are taken into account, the choice between strict liability and negligence becomes less clear in the manufacturing defect setting. The comparison depends in part on the litigation outcomes under the negligence rule – that is whether the negligence rule operates in a manner nearly equivalent to strict liability or whether the negligence rule leads to a substantially lower liability risk relative to strict liability. I will adhere to the assumption that it leads to a substantially lower liability risk, which is plausible in light of the tendency for manufacturing processes to become more efficient over time.[103]

Assume, then, that the negligence rule would impose a relatively light liability burden on the manufacturer for manufacturing defects. When litigation costs and insurance-market inefficiencies are incorporated into the analysis, strict liability clearly would push consumption levels below the optimal level. Negligence, in contrast, would probably result in over-consumption, since manufacturers would frequently escape liability. Both outcomes are inefficient, and the choice between the two involves comparing relative inefficiencies.

[103] The tendency toward greater efficiency can be attributed to manufacturing experience, within a given process, and to technological change over time. On the experience (or learning curve) effect, *see, e.g.*, Kenneth J. Arrow, *The Economic Implications of Learning by Doing*, 29 REV. ECON. STUD. 155, 155-56 (1962); Marvin B. Lieberman, *The Learning Curve and Pricing in the Chemical Processing Industries*, 15 RAND J. ECON. 213, 213-14 (1984). On the effect of technological change, *see* Robert M. Solow, *A Contribution to the Theory of Economic Growth*, 70 Q. J. ECON. 65 (1954). As firms become more efficient, a greater percentage of them should be able to adopt the best industry practices and minimize defects in the manufacturing process.

One feature that should play an important role in the analysis is the trend toward safety, an empirical fact frequently noted by scholars who are critical of products liability law.[104] Products have become safer over time, as consumers demand more in terms of quality. In view of this trend, the market is likely to produce a *paradox of safety*: as consumers anticipate high levels of safety in general, their expectation of danger diminishes to the point that is no longer a useful means of distinguishing products on the market. A consumer who must choose between a product that has a dangerous defect in only one out of 1million products and another product that has a dangerous defect in only one out of 2 million products will be inclined to ignore the difference between the two products. Perceptions of risk differences at such a microscopic level effectively fade into the background. Consumer demand will no longer sort dangerous from safe products.

When the safety paradox holds, the prevalence of safety dulls risk sensitivity as a means of discernment, and the case for strict liability for manufacturing defects strengthens. Manufacturing defects, unlike the design defects examined earlier, generally fall in the class of unobservable risk characteristics, at least when a consumer observes a particular product. However, reputation and general quality perceptions could in theory permit consumers to distinguish products according to their probabilities of a dangerous manufacturing defect. But this is unlikely to occur when the probabilities of a dangerous defect appearing are infinitesimal.

B. Failure to Warn

Failure to warn litigation is perhaps the least controversial area of products liability, in terms of the basic economic function of the law. Courts do not apply the various strict liability theories examined earlier to failure to warn cases; they are decided on the basis of the negligence test.[105] That implies a comparison of the losses that could be avoided by issuing a warning to the burden of issuing a warning.

It might seem obvious at first glance that producers should lose these cases. The benefits of a warning can be substantial – enabling the consumer to avoid life-altering injury – while the costs of a warning appear to be trivial. The producer need only type out a warning on a sheet of paper attached to the product.

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[104] *See, e.g.*, George L. Priest, *Products Liability Law and the Accident Rate*, *in* LIABILITY: PERSPECTIVES AND POLICY 184, 190-91 (Robert E. Litan & Clifford Winston eds. 1988); Paul H. Rubin, *Markets, Tort Law, and Regulation to Achieve Safety* 2 (Emory Law & Econ. Research Paper No. 11-94, 2010), *available at* http://ssrn.com/abstract=1727607. Priest presents data on work-related deaths, which show a steady decline over the period of his sample. *See* Priest, *supra*, at 191. The death numbers are reliable because they are unlikely to be distorted by reporting practices. Priest also presents evidence of product-related injuries, collected by the Consumer Product Safety Commission. *See id.* at 192-93. Unlike the death numbers, these accident numbers are likely to be distorted by reporting practices.

[105] *See, e.g*, McCullock v. H.B. Fuller Co., 981 F.2d 656, 658 (2nd Cir. 1992) (holding that under Vermont law, in failure to warn cases "a strict liability claim and a negligence claim are essentially the same"); Enright by Enright v. Eli Lilly & Co., 570 N.E.2d 198, 203 (N.Y. 1991) ("a failure to warn of dangers of which the manufacturers knew or with adequate testing should have known . . . though it may be couched in terms of strict liability, is indistinguishable from a negligence claim").

However, courts have noted that the costs of warning are not necessarily trivial.[106] For some products, the number of consumer-product interactions that could lead to injury is large. A manufacturer who warns of each possible interaction that could result in injury might overwhelm the consumer with so much information that he chooses not to read the warning manual.[107] Alternatively, a consumer who reads each warning carefully may discover yet another injurious interaction with the product that is outside of the specific interactions covered in the warning manual. For these reasons courts have sometimes relieved manufacturers of a duty to warn of specific injurious interactions.

The failure-to-warn case law generates novel issues that are not observed in the run-of-the-mill negligence cases. For example, courts have adopted a heeding presumption that effectively shifts the burden on causation (would the consumer have changed his conduct in the light of the warning?) to the manufacturer.[108] However, these issues are unconnected the economics of strict products liability, which is the focus of this paper.

V. Normative Assessment

This paper has focused on a positive analysis of the broad incentive effects of the rules associated with products liability law. Its purpose has been to provide a roadmap for courts and policymakers to use in understanding the tradeoffs generated by the legal standards, and in reforming the system. I am unable to say whether the products liability system enhances social welfare or reduces social welfare overall. Any assessment of the ultimate welfare impact of products liability will have to be based on a comparison of the costs and benefits in light of the empirical evidence.[109] Still, there are some conclusions that can be drawn from the analysis of this paper.

In the absence of products liability there is likely to be overconsumption of risky products and an excessive tendency on the part of producers to choose designs with hidden risks. There are several reasons that these bad outcomes are probable.

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[106] *See, e.g.*, Cotton v. Buckeye Gas Products, 840 F.2d 935, 937-938 (D.C. Cir. 1988) (noting costs of information clutter in warnings); Hood v. Ryobi, 181 F.3d 608, 611 (4th Cir. 1999) (same).

[107] *Hood*, 181 F. 3d at 611 ("Well-meaning attempts to warn of every possible accident lead over time to voluminous yet impenetrable labels too prolix to read and too technical to understand.")

[108] *See, e.g.*, Coffman v. Keene Corp., 628 A.2d 710, 720 (N.J. 1993); Moore v. Ford Motor Co., 332 S.W.3d 749, 762 (Mo. 2011); Magro v. Ragsdale Bros., Inc., 721 S.W.2d 832, 834 (Tex. 1986); House v. Armour of America, Inc., 929 P.2d 340, 347 (Utah 1996); Town of Bridport v. Sterling Clark Lurton Corp., 693 A.2d 701, 704 (Vt. 1997).

[109] There are relatively few empirical studies of the products liability system. I am aware of only one empirical study that assesses the welfare impact of products liability litigation, though only with respect to failure to warn lawsuits against drug manufacturers. *See* Eric Helland, Darius Lakdawalla, Anup Malani & Seth A. Seabury, Tort Liability and the Market for Prescription Drugs (July 6, 2011), *available at* http://ssrn.com/abstract=1883691. The Helland et al. study finds empirical support for the claim that products liability litigation enhances consumer welfare in the prescription drug market. The Helland study's results support the theoretical arguments of this paper. The study finds that products liability law enhances market efficiency by pushing out of the market the lowest quality products. The Helland study's results contradict one of the key recommendations of Viscusi, who argues that failure to warn litigation should be supplanted by regulatory standards on warnings, see Viscusi, *supra* note 2, at 9-10.

If a new product design appears on the market, and its incremental risks are obviously greater than its incremental utility, relative to some safer alternative available, consumers will tend not to purchase the new product. Anticipating the poor reception from consumers, producers are unlikely to bring such products to the market, and especially unlikely to invest resources into the innovation of such products. In contrast, consumers do not have sufficient information on the risk characteristics of complicated products to be able to take the precise risks into account in purchasing decisions. It follows that the products on the market that have risks in excess of benefits to consumers (relative to safer available alternatives) are likely to be those for which the risks are unobservable or in some sense likely to be passed over by the consumer until it is too late.

There is perhaps no better example of this problem than the injuries caused when steering wheel designs permitted them to be jammed inward during car collisions. Few consumers, if any, compared the relative risks of steering wheel impalement in determining whether one car model would be preferable to an alternative model. Consumers have tended to focus on the physical appeal of cars, functionality (e.g., ability to carry passengers), maneuverability, and engine power.[110] Injuries caused by steering wheels were not brought to the attention of the public until Ralph Nader's *Unsafe at Any Speed*.[111] It is an open question whether the steering wheel injuries would have been designed out at the same rate even if Nader's book had not been published.

As a result, the vast majority of products liability cases, the portion of product space on which the law effectively operates, involve products that have the combination of observable utility, which attracts consumers, and hidden risk. This is precisely the product space in which the market is unlikely to serve as an adequate regulator of producer incentives. Government is too small and cannot possibly grow large enough to effectively regulate such a vast area of the market.

In addition, products liability law operates on the specific set of circumstances in which regulation is socially desirable.[112] The cases that come to court involve real injuries, rather than faked or potential injuries. In order to prevail, the plaintiff has to prove that a design improvement could reduce the risk of injury without seriously degrading the utility of the product. The value of this precision is best seen in comparison to alternative regulators. The Consumer Product Safety Improvements Act of 2008 requires producers of toys and other items children use to reduce lead content.[113] In response to the legislation, the Consumer Product Safety Commission reduced permissible lead levels by two-thirds in 2011.[114] However, the

[110] Such consumer preferences are still apparent today. Consider automotive retail websites like www.autotrader.com. When researching an automobile, consumers can sort automobiles based on make, model, engine size, and color. However, there are no corresponding search fields for safety.

[111] RALPH NADER, UNSAFE AT ANY SPEED: THE DESIGNED-IN DANGERS OF THE AMERICAN AUTOMOBILE 81-100 (1972).

[112] Steven Shavell has argued that one reason liability is preferable to regulation is because it operates on the parties who are most likely to cause harm, *see* Steven Shavell, *Liability for Harm Versus Regulation of Safety*, 13 J. LEG. STUD. 357, 364 (1984).

[113] Consumer Product Safety Improvement Act of 2008, 122 Stat. 3017 (2008).

[114] Children's Products Containing Lead; Technological Feasibility of 100 ppm for Lead Content; Notice of Effective Date of 100 ppm Lead Content Limit in Children's Products, 76 Fed. Reg. 44463 (July 26, 2011) (to be codified at 16 C.F.R. pt. 1500); Editorial, *Toying With Deregulation*, WALL ST. J., July 20, 2011, at A18; Ellen

statute applies broadly to products used by children without regard to the likelihood that lead consumption will lead to injury. Take, for example, bicycles. The law reportedly has led to the exit of one quarter of the producers of children's bicycles, because of its reduction in allowable lead content.[115] But the likelihood of lead in a bicycle causing harm is low. In comparative terms, products liability law would pose a threat to bicycle producers, on the basis of lead content, only if the lead actually caused injuries. Admittedly, this example may not be representative of all regulatory agencies, because it reflects the hurried response by Congress at the time to findings of high lead content in toys from China. But it does serve to illustrate the possible divergence in method between regulation under the products liability laws and traditional government agency regulation.

Given the low likelihood that regulatory agencies could manage the scale of activity reviewed under products liability law, or could craft rules that target with precision the product risks that should be controlled, products liability law performs a regulatory function that could not be supplanted by regulators. Roughly fifty thousand product liability lawsuits are filed in federal courts each year.[116] If federal regulators worked every day of the year, they would have to examine nearly 140 serious product injury claims daily. And even if voters were to approve the expenditure of sufficient resources for federal agencies to handle the workload of federal courts, regulators would be hard pressed to consistently perform as well as courts do in distinguishing serious from trivial instances of product risk.

The negative feature of strict products liability is that it imposes a socially excessive tax on consumption and may also discourage welfare-enhancing product innovation. When the costs of litigation, uncertainty of application, and insurance-market inefficiencies are taken into account, it is likely that the liability system excessively discourages the consumption of products with risky features.

The normative prescription that emerges from this paper is that courts focus on reforming products liability in order to clarify its scope, and to reduce litigation and insurance-market inefficiencies. Effective products liability reform can be conducted within the courts by modifying parts of the law that generate some of its most costly features. The specific areas of reform I detail below are: (1) the feasible safe alternative requirement,[117] (2) legal doctrine governing ambiguous risk-utility tradeoffs,[118] (3) insurance market inefficiencies,[119] (4)

Gabler, *Safety commission slashes toy lead level limits \ New rule takes effect Aug. 14, but some say it's overly burdensome,* CHI. TRIB., July 14, 2011, Business (Zone C) at 3.

[115] *Toying With Deregulation*, *supra* note 114.

[116] Polinsky & Shavell, *supra* note 1, at 1439 n.2.

[117] *See generally* 63A Am. Jur. 2d *Products Liability* § 999 (2011) ("The essential inquiry is whether the design chosen was a reasonable one from among the feasible choices of which the defendant was aware or should have been aware").

[118] For an overview of the risk-utility test and how courts have applied it, *see* Aaron D. Twerski & James A. Henderson, Jr., *Manufacturers' Liability for Defective Product Designs: The Triumph of Risk-Utility*, 74 BROOKLYN L. REV. 1061 (2009).

[119] George L. Priest, *The Current Insurance Crisis and Modern Tort Law*, 96 YALE L.J. 1521 (1987) (detailing the problems created by third-party liability insurance).

preemption,[120] (5) bright line rules versus vague standards,[121] and (6) controlling incentives for fraud in mass torts.[122] This is by no means an exhaustive list of the areas in which products liability law can be reformed, but it covers perhaps the most important areas.

A. The Feasible, Safer Alternative Requirement

One simple reform is to require that the plaintiff present evidence of a feasible alternative design, as the *Restatement (Third)* recommends, and to generally incorporate an analysis of alternatives as a necessary component of the risk-utility test.[123] Requiring proof of the existence of a feasible alternative would reduce uncertainty surrounding the risk-utility test and enable courts to apply the test in a more consistent manner. In the absence of a feasible alternative design, it is a matter of guesswork and opinion whether the challenged product design is unreasonably dangerous. The feasible, relatively safe alternative provides the comparison point for an evaluation of the risk and utility tradeoff in any design. Without an objective comparison point, the only way to find that a specific design is unreasonably dangerous is to compare it to some theoretical ideal, which may be unattainable, or if attainable, may not be better in terms of its net contribution to consumer welfare than the challenged design. This would appear to be a commonsense proposal, but some courts have rejected it.[124]

The feasible alternative requirement has been understood to require the plaintiff to propose a feasible alternative of the same type as the challenged product. In other words, the requirement is not satisfied if the plaintiff proposes a bicycle as a feasible alternative to a car design.[125] In some cases, however, it may be impossible for the plaintiff to find a feasible alternative product – e.g., where the product is the first of its kind. However, if we broaden the feasible-alternatives inquiry it becomes clear that some feasible alternative always exists. Simply ask what the basic function of the challenged product is, and find another product that can accomplish the same

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[120] *See* Alan Schwartz, *Statutory Interpretation, Capture, and Tort Law: The Regulatory Compliance Defense*, 2 AM. L. & ECON. REV. 1 (2000) (arguing that compliance with federal regulatory standards should excuse firms from liability).

[121] As between the consumer expectations test and the risk-utility test, the consumer expectations test has the advantage of at least a superficial simplicity. If a court holds that a producer's product meets consumer expectations, then its decision settles the question of liability for the particular challenged product and for similar products. The risk-utility test, however, involves a balancing inquiry that, arguably, invites future litigation. The Restatement (Third) of Torts: Products Liability favored the risk-utility test over the consumer expectations test. *Compare* RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2(b) cmt. d (1998) ("Subsection (b) adopts a reasonableness ('risk-utility balancing') test as the standard for for judging the defectiveness of product designs.") *with id.* at cmt. g ("[C]onsumer expectations do not play a determinative role in determining defectiveness."). However, for various reasons, courts and academics continue to advocate the consumer expectations test. *See, e.g.*, Douglas A. Kysar, *The Expectations of Consumers*, 103 COLUM. L. REV. 1700, 1702 (2003) (the use of both consumer expectations and risk-utility tests would "effectuate important lay risk values that seem unlikely to register in the more narrowly delineated risk-utility test").

[122] Keith N. Hylton, *Asbestos and Mass Torts with Fraudulent Victims*, 37 SW. U. L. REV. 575 (2008) (proposing ways to deal with fraudulent claims in mass tort litigation).

[123] RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2(b) (1998).

[124] Potter v. Chicago Pneumatic Tool Co. 694 A.2d 1319, 1331 (Conn. 1997); Kallio v. Ford Motor Co. 407 N.W.2d 92, 96-97 (Minn. 1987).

[125] For a discussion on what can be considered a reasonable alternative design, *see, e.g.*, Richard L. Cupp, Jr., *Defining the Boundaries of "Alternative Design" Under the Restatement (Third) of Torts: The Nature and Role of Substitute Products in Design Defect Analysis*, 63 TENN. L. REV. 329 (1996).

function. Under this approach, a bicycle might be proposed as an alternative to a certain model of car. But once the set of benchmarks is broadened it becomes clear that alternatives can shed important light on risk-utility analysis. Suppose, for example, a bicycle is the likely feasible alternative to a specific car design. Removing the challenged car design from the product would leave its users with the option of using bicycles, which might increase injury risk. Similarly, finding an airplane design defective when there is no obvious feasible alternative design among airplanes leaves consumers with the option of driving, which exposes the consumer to a greater injury risk than flying.

Linegar v. Armour of America provides an illustration of the value of analyzing realistic alternatives.[126] The alternative to the bullet-proof vest challenged would have been a vest that covered the torso as well as the arms – leaving almost no open areas where a bullet could reach vital organs. The court noted that most police officers would refuse to use such a vest because of its restrictions on mobility, and police departments might be unable to afford it because of its expense. Thus, risk-utility analysis involves not only an analysis of the properties of the safer alternative, but its likely reception in the market, and use by consumers.

The problem of requiring a feasible alternative is entirely analogous to that of requiring specificity in a negligence action. Negligence law has long required plaintiffs to bring forth a specific untaken precaution as evidence of negligence.[127] Many courts have repeated the famous comment "Negligence in the air, so to speak, will not do."[128] The purpose for requiring a specific untaken precaution is to permit courts to determine negligence on the basis of feasible alternatives, and within a realistic causation framework. In the absence of the specificity requirement, negligence lawsuits would involve allegations of negligence based only on the occurrence of the accident and its foreseeability.[129] Such a test would not permit courts to develop a consistent policy with respect to the level of care that should be required and the degree of foreseeability that implies negligence. Policy consistency requires courts to consider tradeoffs between feasible alternatives.

B. Risk-Risk Tradeoffs

A second area of products liability doctrine in need of reform consists of cases in which there is no clear improvement in the level of risk imposed on the consumer when the challenged design is compared to the allegedly safer alternative. I am not referring here to cases in which the balance between risk and utility is unclear; cases such as this exist and courts are as well equipped to handle them as they are for handling cases in which the negligence question is unclear. I refer instead to the cases in which the challenged design and the proffered alternative both impose a risk of injury on the consumer, as in *Dawson v. Chrysler Corp*.[130] The plaintiff, injured in an accident in which the side of his car slammed against a steel pole and crushed inward, asserted that the car was defectively designed because it did not have a continuous steel

[126] Linegar v. Armour of America, Inc., 909 F.2d 1150 (8th Cir. 1990).
[127] Mark F. Grady, *Untaken Precautions*, 18 J. LEGAL STUD. 139, 143 (1989).
[128] Palsgraf v. The Long Island Railroad Company, 162 N.E. 99, 99 (1928) (quoting FREDERICK POLLOCK, THE LAW OF TORTS 455 (11th ed. 1920)).
[129] Stone v. Bolton, 1 K.B. 201 (C.A. 1950).
[130] Dawson v. Chrysler Corp., 630 F.2d 950 (3d Cir. 1980).

box frame that would have kept the pole from crushing the driver. The defendant's expert argued that the crumpling of the car side was preferable in some instances to a box frame, because the latter design would transmit the force of the impact to the driver and passengers. *Dawson* involved a risk-risk tradeoff because both the challenged design and the allegedly safer alternative both imposed a substantial risk of injury on car occupants in the event of an accident. The appellate court, while recognizing the troubling implications of finding liability, upheld a jury verdict finding Chrysler liable for a defective design.

An obvious reform that would push products liability law closer to its theoretical ideal is for courts to require high standards of proof in risk-risk tradeoff cases such as *Dawson*. As the court in *Dawson* recognized, a policy of generally holding producers liable in the risk-risk tradeoff cases creates a bind in which producers cannot escape liability.[131] Given a choice between a box frame and an x-frame, manufacturers would realize that either choice would lead to liability precisely because it failed to offer the safety protections that the alternative offered. When products liability law effectively imposes liability for all realistic design alternatives, it no longer offers the possibility of guiding firms toward higher net-utility designs. The law merely serves as a mechanism to compensate plaintiffs. While plaintiff compensation may be a desirable goal, it is unclear why products liability law should be used for this purpose given its high administrative costs.[132] More importantly, when the law fails to provide useful design incentives, it serves only as a broad blanket of liability, reducing production levels as well as investment into the discovery of safer alternatives.

Risk-risk tradeoff cases involve separable questions of breach and causation, as in ordinary negligence cases. Breach is determined by whether the design is unreasonable under the risk-utility standard. Causation is determined by asking whether the particular injury would have occurred even if the alternative design had been adopted.

Determining the unreasonableness of a design in the risk-utility analysis is a forward looking inquiry, as is the question of breach in a negligence case. For the producer's design to be found unreasonable, it must fail the risk-utility comparison in the average, or general run, of accident settings that are likely to involve the product. In *Dawson*, this would require abstracting away from the particular accident that occurred and examining the Chrysler Monaco's x-frame design under alternative accident scenarios. The x-frame design could be found unreasonable under the risk-utility test only if the box-frame resulted in a lower injury risk, in most realistic accident settings, without degrading the utility of the vehicle.

The causation inquiry examines whether the particular injury that occurred, or a roughly similar injury, would have occurred even if the producer had used the alternative design proposed by the plaintiff. In other words, if Chrysler had adopted the box frame for the Dodge Monaco, would the plaintiff in *Dawson* have experienced a similar injury?

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[131] *Id*. at 962 (noting that a risk-risk tradeoff case "permits individual juries applying varying laws in different jurisdictions to set nationwide automobile safety standards and to impose on automobile manufacturers conflicting requirements").

[132] Some courts reject the insurance theory as the sole basis for awarding damages, *see, e.g.,* Cafazzo v. Central Medical Health Services, Inc*.*, 635 A.2d 151, 154 ((Pa. Super. Ct. 1993), *aff'd*, 668 A.2d 521 (Pa. 1995).

In order to prevent risk-risk tradeoff from punishing firms for the mere act of selling a product, courts should demand reliable proof on both the questions of design-reasonableness under the risk-utility test and the causation component. In order to minimize the risk of erroneous findings of liability, courts could impose a "clear and convincing" standard of proof for these questions in risk-risk tradeoff cases.

C. Moral Hazard and Adverse Selection

On first impression, moral hazard should be a relatively minor concern in products liability law. Most of the cases involve personal injury, and relatively few people would risk personal injury because they think they will be compensated as the result of a products liability lawsuit. But there are reasons to suspect that moral hazard leads to significant losses in consumer welfare given the current state of products liability doctrine.

Even assuming people are unlikely to take risks with their own lives or health just because the law offers them compensation, they may take risks with property or with other people's lives. The most likely area for moral hazard to influence behavior is in the workplace, where employers know that employees are more likely to try to sue the manufacturer of a machine that injures them than their own employer, who is shielded from significant damages by workers compensation.[133] The combination of arbitrary caps on compensation under workers compensation coupled with the prospect of generous damage awards under products liability generates disincentives for workplaces to investments in safety training and in supplemental safety equipment.

And even with personal conduct and risk, moral hazard can generate significant losses to consumer welfare. Assume, as is common intuition, that consumers are unlikely to take risks with their own lives merely because they will be compensated through a products liability lawsuit. Still, the producer may be required to pay compensation, as well as legal fees, when its product causes an injury to the consumer. Given this, the producer may have to set the price of his product to take into account the behavior of high-accident-risk consumers. If the producer increases the product's price to cover compensation to high-accident-risk consumers, the price increase may alter the mix of consumer types purchasing the product. As the product exposes the consumer to greater injury risk, the price will have to rise accordingly, leading less intensive (and probably lower risk) consumers to forgo the product, and to an even greater liability premium attached to the product as the mix of product purchasers shifts toward more intensive consumers.

The law could dampen the welfare losses from moral hazard and adverse selection by refusing compensation when the injured consumer has been negligent. But this is not a complete answer to the moral hazard problem. Even when the consumer has not been negligent, there may be safety steps or investments that would be desirable, though failure to adopt the steps might not be regarded as negligent.

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[133] *See supra* note 82 and accompanying text; Karen M. Moran, *Indemnity Under Worker's Compensation: Recognizing a Special Legal Relationship Between Manufacturer and Employer*, 1987 DUKE L.J. 1095, 1098-99 (1987).

Although adverse selection and moral hazard could be dampened by refusing compensation to negligent or obviously careless consumers, products liability law has been more generous. Some courts have held producers liable for the foreseeable misuse of products by consumers.[134] Jurisdictions with comparative fault have incorporated products liability into the comparative fault system, so that careless consumers are still guaranteed some level of compensation.

Daly v. General Motors Corp.[135] established the principle of comparative negligence in products liability lawsuits in California. The plaintiff, Kirk Daly, was thrown out of his car and sustained fatal injuries when he ran his Buick Opel into the metal lane divider of an expressway. The car was alleged to be defectively designed because of its exposed push button door lock, which according to the plaintiff caused the car door to open when it was depressed in the collision. The defendants introduced evidence that the injury could have been avoided if Daly had locked his car door, or had worn a seat belt, and that he was intoxicated at the time of the accident. After a jury verdict for the defendants, the California Supreme Court held that the jury should apply comparative negligence principles and provide a judgment to the plaintiff that reflects the relative weight of the defendant's negligence.

Like comparative negligence for product-caused injuries, the foreseeable misuse doctrine has a basis in negligence law. Courts have long been reluctant to hold victims liable for slight or foreseeable instances of contributory negligence.[136] The foreseeable misuse doctrine can be analogized to the relatively forgiving approach toward accident victims that courts have traditionally followed in ordinary negligence cases. This forgiving approach has been associated with the contributory negligence regime, in which victims lose any claim to damages if they are negligent.

But the cost of a forgiving stance in contributory negligence is relatively low and actually supports incentives to take care. Allowing a slightly negligent victim to receive damages against one injurer does not impose costs on all other potential injurers or on other potential victims. In addition, slight instances of victim negligence are foreseeable and one could say that primary negligence, on the part of the injurer, is often negligent precisely because it fails to accommodate the foreseeable lapses of the potential victim.[137]

In the products liability context, the foreseeable misuse doctrine appears to be more generous than a policy limited to forgiving foreseeable consumer lapses. Since foreseeable misuse could be extended to misuses that producers would not foresee, the doctrine forces producers to include

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[134] *See, e.g.*, Steinmetz v. Bradbury Co., 618 F.2d 21, 23 (8th Cir. 1980) (holding "rigidizer" machine manufacturer could not escape products liability on the basis of product misuse, because such misuse was foreseeable); Lutz v. Nat'l Crane Corp., 884 P.2d 455, 460 (Mont. 1994) (precluding "unreasonable misuse" defense as a matter of law in action against crane manufacturer, because such misuse was foreseeable); Soler v. Castmaster, Div. of H.P.M. Corp., 484 A.2d 1225, 1232 (N.J. 1984) ("[I]n the event of either a substantial alteration or misuse, the manufacturer will be responsible for resultant injuries to an operator if the alteration or misuse implicated in the actual use of the machine was foreseeable and could have been prevented or reduced by the manufacturer."); Germann v. F.L. Smithe Mach. Co., 395 N.W.2d 922, 925 (Minn. 1986).

[135] Daly v. General Motors Corp., 575 P.2d 1162 (Cal. 1978).

[136] Gary Schwartz, *Tort Law and the Economy in Nineteenth Century America: A Reinterpretation***,** 90 YALE L.J. 1717, 1744-1747, 1752, 1760-1763 (1981).

[137] See WILLIAM L. PROSSER, HANDBOOK OF THE LAW OF TORTS 274 (1971).

a liability premium that covers product uses that most careful consumers would not consider advisable. The liability premium associated with product misuses shrinks the market and taxes careful consumers to pay for the consequences of the conduct of careless consumers.[138]

Given the costs of foreseeable misuse, comparative negligence, and other doctrines that tax relatively careful consumers to pay for the injuries of careless consumers, courts should approach these doctrines with an eye toward restraining their scope within narrow and predictable bounds. Extreme cases of carelessness on the part of the consumer, as in *Daly*, should not be funneled through the liability system as a tax on ordinary consumers. Courts should distinguish between cases involving consumer lapses, or failure to take every step to avoid injury, and cases involving gross negligence or indifference to the intended uses of the product.

D. Preemption

Closely related to the problem of risk-risk tradeoffs is the matter of preemption. Many of the product designs that are challenged in state-court products liability lawsuits have been approved by federal regulatory agencies, such as the Food and Drug Administration or the Consumer Product Safety Commission. Defendants in products liability lawsuits have defended themselves by relying on the argument that federal regulation preempts state regulation through the products liability laws.

The preemption doctrine serves a useful purpose. If experts in the Food and Drug Administration have approved the design of a medical device, after hundreds of hours of rigorous examination, why should juries be allowed to second guess that approval decision in a products liability lawsuit? The juries are less likely to make empirically defensible tradeoffs between risk and utility than are the experts consulted by the agency. From this perspective, preemption doctrine can enhance consumer welfare by ensuring that scientifically accurate assessments of risk-utility tradeoffs, made in connection with technologically complicated products, can be respected by courts and serve as a defense to products liability lawsuits that challenge those assessments. To be sure, regulatory agencies are not always perfect, as the lead regulation example previously discussed suggests, but when agency experts conduct a careful assessment of the risk-utility tradeoff associated with a product, it is unlikely that an ordinary jury will be able to make a more accurate assessment of the same tradeoff.

However, a funny thing has happened to preemption doctrine over the course of its life. It has morphed from a legal device that prevented juries from second guessing the work of agency experts to a battle ground over the scope of federal power relative to state power.[139] Preemption questions inevitably end up in the Supreme Court, with justices voting according to their interpretations of the Supremacy Clause and its implications for the power of federal regulatory agencies to preclude states from regulating matters within agencies' remit. As long as this state of affairs continues, preemption doctrine is unlikely to settle into predictable rules.[140]

[138] Epstein, *supra* note 78, at 648, 660.
[139] *See, e.g.*, Keith N. Hylton, *An Economic Perspective on Preemption*, 53 B.C.L. REV. 203, 223-227 (2012).
[140] *Id.*

There is an alternative way to examine the preemption question. Instead of viewing preemption exclusively through the Supremacy Clause, state courts could, in the alternative, develop doctrines of abstention or regulatory compliance as a defense.[141] That is, instead of looking at preemption as a question of the federal government's power to constrain states, courts can look at it as a question of the state's own power to constrain itself. Common law doctrines that recognize regulatory compliance as a defense, under appropriate conditions, could provide a predictable, stable source of rules governing the relationship between state and federal regulation in a products liability lawsuit. Such rules would limit the uncertainty and instability inherent in preemption defenses.

E. Bright Lines and Balancing

Given the dominance of the risk-utility test, one might ask whether there is any value to courts in retaining the consumer expectations test in products liability law. The question is really one of the choice between bright lines and balancing tests, or rules versus standards. The consumer expectations test is a bright line test, and the risk-utility test involves fact-based balancing.

In a purely functional sense, there is little reason for courts to retain the consumer expectations test. Most of the cases can be reconciled with the risk-utility test, even the cases that claim to be based on the consumer expectations test. Why not make things simpler by jettisoning the consumer expectations test?

A better case can be made for retaining the consumer expectations test, largely for its value in clarifying the scope of liability for producers. With a clearer picture of the scope of liability, producers will be able to make more accurate predictions of their payouts for products liability lawsuits. This will lead to a reduction in the products liability premium, to the benefit of consumers.

The consumer expectations test is easily applied in cases involving risk features that are obvious and central to the function of the product, such as absence of a hard roof for convertible cars.[142] These are cases that will pass the risk-utility test as well, because the obvious risk-imposing feature is also something that is central to function. Typical examples are the exposed propeller blades of airplanes, or of boats.[143] The danger is open and obvious, and also necessary for the product to function as intended. Given the functional value of the risk-imposing feature, courts applying the risk-utility test would hold that the product is not unreasonably defective.[144]

For this class of products, the consumer expectations test provides a bright line rule that informs potential victims and potential injurers of the likely outcome of a products liability lawsuit. This is valuable to producers because it provides a level of predictability with respect to the trial outcome that is not provided by the risk-utility test. Of course, once a precedent has been established under the risk-utility test, that precedent offers predictability to potential defendants. But every risk-utility examination is fact-dependent, and therefore possibly unique to the case,

[141] *Id*. at 229-30.
[142] Dyson v. General Motors Corp., 298 F. Supp. 1064, 1073 (D.C. Pa. 1969).
[143] Fitzpatrick v. Madonna, 623 A.2d 322, 325-326 (Pa. Super. Ct. 1993).
[144] *See Linegar*, 909 F.2d at 1154-55.

unless you are looking at two cases involving precisely the same fact pattern. The consumer expectations test provides a rule of law that permits lawyers to advise clients, and courts to resolve cases on the basis of the *absence of duty* to the consumer.[145]

As a positive theory, the predictability value of the consumer expectations test probably explains why it remains in use even as courts have progressively embraced the risk-utility test. For example, in *Halliday v. Sturn, Ruger & Co*.[146] the Maryland Supreme Court was urged by the plaintiff to adopt the risk-utility standard with respect to handgun child-safety features. The court refused and upheld a jury verdict for the defendant on the ground that the plaintiff's handgun had performed as expected when the plaintiff's three-year old child got hold of it and fatally shot himself. The court might have been able to reach the same conclusion using the risk-utility test, though with difficulty given the facts. The feature of the consumer expectations test that presumably made it attractive to the court in *Halliday* is that it abstracts away from a fact-dependent risk-utility analysis and permits a court to issue a broad liability shield with respect to a specific design.[147]

F. Controlling Incentives for Fraud in Mass Torts

My final reform proposal is specific to products liability class actions. The asbestos and silicosis cases have revealed that plaintiffs' attorneys have incentives to bundle fraudulent victims within large classes.[148] Some recent investigations into the asbestos and silicosis plaintiff classes have discovered large numbers of victims within plaintiff classes that had been diagnosed with diseases related to asbestos or with silicosis even though a closer inspection revealed that these diagnoses were unlikely to be valid.[149]

The incentive for fraud in mass torts is a byproduct of settlement strategy. For a class action, lawyers are aware that having a large class puts settlement pressure on defendants. Even if the defendant thinks that the chance that he will be held liable is only one percent, the risk of high damages from trial becomes significant as the plaintiff class size grows.

Suppose the defendant is innocent under a correct application of the risk-utility test. If each plaintiff suffers a loss of $100 and the risk of an erroneous finding of liability is only one percent, then the expected damage payment for a defendant is only $1. Suppose, however, that the lawyer comes to court with a class of 10 million victims, each with a loss of $100. Assuming the likelihood of an erroneous finding of liability is still one percent, the expected damage payout for the defendant is $10 million. Thus, even though the defendant expects confidently to win at

[145] For a discussion of the predictability-value of duty rules, see Keith N. Hylton, *Duty in Tort Law: An Economic Approach*, 75 FORDHAM L. REV. 1501, 1525-26 (2007).
[146] 792 A.2d 1145, 1149 (Md. 2002).
[147] I do not want to be understood as offering a defense for the decision in *Halliday*. My point is that, as a positive matter, courts will tend toward the consumer expectations test in order to provide clear statements on the scope of liability.
[148] See, e.g., Helen E. Freedman, *Selected Ethical Issues in Asbestos Litigation*, 37 SW. U. L. REV. 511, 522 (2008) (discussing Judge Janis Jack's discovery of a fraudulent class of silicosis plaintiffs).
[149] Lester Brickman, *Disparities Between Asbestosis and Silicosis Claims Generated by Litigation Screenings and Clinical Studies*, 29 CARDOZO L. REV. 513 (2007).

trial, the risk of an erroneous finding in favor of the plaintiff will put settlement pressure onto the defendant.

In addition to knowing that large classes increase settlement pressure, lawyers also know that the defendant is unlikely to examine every single plaintiff within the class; that would be too costly. Given this, plaintiffs' lawyers, as the silicosis and asbestos cases suggest, have realized that there is a positive payoff in including fraudulent plaintiffs within the class.

Although the problem of fraudulent plaintiffs appears to have been discovered only in the asbestos and silicosis cases,[150] the incentives that have generated it in those cases are general. Courts should develop strong punishments that eliminate the prospect of gain on the part of attorneys if they adopt a strategy of stuffing the plaintiff class with fraudulent victims.

Since the incentive to bundle fraudulent victims is driven by money, the best remedy is a monetary sanction against plaintiffs' lawyers who adopt this tactic. Suppose the lawyer represents a fraudulent class of 5,000 victims, each one claiming $10,000. Suppose the likelihood of the fraud being discovered is 10 percent, and the lawyer expects to earn $10 million from the class action. In order to deter fraud on this order, the penalty would have to be set at $90 million.

This example is admittedly extreme in its assumption that an entire class is fraudulent. But the same principles apply to the bundling of fraudulent claims within a class that is largely legitimate. The court should determine the amount the lawyer expected to earn from the fraud, and divide that amount by the probability that the lawyer's fraud would be discovered. As long as the fine is at least as large as the resulting number, the sanction should provide an adequate deterrent to the bundling of fraudulent claims.

V. Conclusion

This has been a cautious defense of products liability law. In contrast to the skepticism expressed in prominent economic treatments of the topic, I have argued that products liability law probably enhances social welfare. The core doctrines that have evolved appear to be optimal in light of the problems of uncertainty in the application of legal tests in this area. There appears to be no case for wholesale revision or reversal of course. Courts should focus on the specific pockets of doctrine, such as preemption, that generate uncertainty and instability in the law.

[150] *See id*. at 517-518 (quoting Judge James Giles's questioning of the sufficiency of asbestosis screenings as "lacking reliability and accountability"); Brickman *supra* note 90, at 1227-29 (arguing that "specious, if not fraudulent" claims generated by litigation screenings in other types of mass torts have faced little scrutiny, and that Judge Jack's rebuke of silicosis screenings was an anomaly).