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THE EFFECT OF PRIVACY AND LIABILITY SHARING
ON PRODUCT SAFETY AND VERTICAL INTEGRATION

by

Jeffrey M. Perloff and Robert G. Wolf

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THE EFFECT OF PRIVACY AND LIABILITY SHARING
ON PRODUCT SAFETY AND VERTICAL INTEGRATION

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Over time, liability has shifted from consumers or retailers to manufacturers in product liability cases. Unlike most previous studies, this study contends that how liability is shared matters and that allowing consumers to sue manufacturers directly may be harmful under certain circumstances.¹

The relative liability of retailers and manufacturers is determined by three lines of product liability law which evolved together: (1) the dropping of the privity of contract requirement in virtually all products liability cases; (2) the development and spread of strict liability in tort and the evolution of warranty remedies; and (3) the refinement of indemnity rulings and the spread of contribution statutes. A firm's share of liability may also depend on its ability to avoid large payments by going bankrupt, by franchising, or by vertically integrating.

In the previous century, privity of contract prevented a consumer from suing a firm with which he had not directly contracted so that consumers could bring product liability suits against retailers but not manufacturers. As a result, either the consumer or the retailer paid for the accident. Gradually this doctrine eroded so that today consumers can sue firms who are separated from the consumer by intermediary transactions. As a result, consumers can sue retailers or manufacturers. Very often, they choose to sue manufacturers (perhaps jointly with the retailer) because of the relative ease of showing manufacturer rather than retailer liability or because manufacturers have "deep pockets."

During this century, consumers increasingly have been able to obtain relief under warranty and strict tort liability as well as under contract theories. The evolution of these doctrines has largely side-stepped the

privity restriction. As a result, consumers have a tendency to sue the manufacturer directly (deep pockets) using one of these approaches to avoid dealing with the essentially judgment-proof retailers.

There are two major contributions to the current thinking on privity. Richard Posner² argues that, if the manufacturer and retailer activity are observable, the market will guarantee efficient care regardless of privity. In the context of cumulative trauma litigation, however, Richard Epstein suggests that privity is the only way to sort out conflicting claims. Without the restriction, property rights are not assigned, and one cannot rely on the Coase theorem to assure efficient results as Posner does.³ Each of these arguments has merit. Posner is correct when all parties have complete information about the activities of others. But with complex technologies, the lay individual often does not have the ability to evaluate the hazard inherent in each product he consumes.

Epstein is correct in suggesting that, with imperfect information, privity does provide an orderly assignment of liability. However, while privity is a sufficient rule for efficiency, it is by no means necessary. We argue that a broader look of the legal context is in order. Changes in the rules governing joint tortfeasors, which parallel the elimination of privity, have provided alternative assignments of liability which are, under certain circumstances, every bit as clear as those Epstein describes.

To illustrate how a shift in liability may affect social welfare, we use a simple model in which there are upstream manufacturers of unbranded products, downstream retailers, and ultimate consumers. Only the manufacturers and the retailers can affect the safety or quality of the product through

their actions. For example, the manufacturer may design a better product, may use higher quality materials, or may inspect the finished product more carefully. We presume that some care by both the manufacturer and the retailer is generally optimal.

This paper is divided into five sections. The first section is a discussion of the evolution of the relevant legal doctrines. The next section shows how these doctrines determine liability. The third section examines how the splitting of liability affects the functioning of markets and social welfare. The analysis is extended to consider the effects of vertical integration, brand names, and bankruptcy in the fourth section. The last section contains a summary and conclusions. It is followed by a technical Appendix.

I. Major Changes in Products Liability Law

To properly analyze these various interrelated fields of products liability law, we need to examine briefly the major developments in each one. We emphasize that these are just the principal developments. Many jurisdictions have established variations around these basic themes. But an exhaustive comparative study is beyond the scope of this paper. While some will quibble with details across jurisdictions, we believe this fairly represents the broad thrust of recent developments. We note the abandonment of the privity requirement; explain the development of the basic liability principle from one of negligence to one of strict liability in tort (with the parallel development in warranty from explicit warranty to the implied warranty of merchantability; and the state of doctrine relating to damage apportioned among several joined defendants.

A. Privity

Privity of contract is the relationship that exists between contracting parties and, historically, had been a necessary requirement for maintaining an action. This doctrine was formalized in 1842 in the case of Winterbottom v. Wright.⁴ When party A was thrown from a coach negligently maintained by party B, he sought to maintain an action against B. In ruling against A, Lord Abinger stated:

I am clearly of the opinion that the defendant is entitled to our judgment. . . . There is no privity of contract between the parties; and if the plaintiff can sue, every passenger, or even any person passing along the road, who was injured by the upsetting of the coach, might bring similar action. Unless we confine the operation of such contracts as this to the parties who entered into them, the most absurd and outrageous consequences, to which I can see no limit, would ensue.

Expansion of liability beyond the immediate parties to the contract was not allowed. Party A would have had remedy if, and only if, he had directly contracted with supplier B.

Exceptions to Winterbottom emerged within a decade and centered on the concept of "inherent and imminent danger."⁵ Most of these exceptions concerned poisons, food, drink, and construction materials.⁶ The growing number of special cases created, as Prosser notes, "a legal fog with a general rule circumscribed by various exceptions."⁷

This fog was dissipated by the MacPherson v. Buick Motor Co. decision.⁸ In that case, Buick sold a car with a defective wheel to a retailer who resold it to the plaintiff. When the wheel crumbled and the plaintiff was thrown from the car sustaining significant injuries, he sued Buick. While the wheel

was not made by the defendant, there was "evidence that its defects could have been discovered by reasonable inspection and that inspection was omitted."

Judge Cardozo ruled that:

If the nature of a thing is such that it is reasonably certain to place life and limb in peril when negligently made . . . (and) if there is knowledge that the thing will be used by persons other than the purchaser, then, irrespective of contract, the manufacturer . . . is under a duty to make it carefully. (The defendant was) a manufacturer responsible for the finished product (and) . . . was not at liberty to put the finished product on the market without subjecting the component parts to ordinary and simple tests.

The MacPherson ruling has been adopted by all states and extends to all phases of production⁹ and design.¹⁰

In addition, a third party's duty to inspect is no defense. As interpreted in the Restatement:¹¹ "A manufacturer . . . is subject to liability . . . although the dangerous character or condition of chattel is discoverable by an inspection which the seller or any other person is under a duty to the person injured to make."

As interpreted, MacPherson removed all privity requirements for cases involving negligence. In the case of either express or implied warranty,¹² however, change came more slowly. Precedents involving manufacturers' implied warranties of merchantability and fitness did exist, though, in the case of food and drink¹³ and developed by 1960 to involve a majority of jurisdictions.¹⁴

In that year the decision in Henningsen v. Bloomfield Motors, Inc.¹⁵ did for all of warranty what MacPherson did for negligence. In that case, Mr. Henningsen purchased a Plymouth as a gift to his wife from Bloomfield Motors, an authorized dealership in Chrysler Corporation. The contract of

sale indicated that all warranty obligation ran to the original purchaser and that such obligation included only the correction of defects to the car. It went on to say that "this warranty being expressly in lieu of all other warranties expressed or implied, and all other obligations or liabilities. . . ." Ten days after delivery of the car, Mrs. Henningsen sustained significant injuries when the steering mechanism of the car malfunctioned. The Henningsens sued both Bloomfield Motors and Chrysler under the principles of warranty.¹⁶

Chrysler disclaimed liability, noting no privity with Mr. Henningsen. Further, both defendants argued that there was no privity with Mrs. Henningsen, and an expressed warranty disclaiming such liability was signed by Mr. Henningsen. In striking down all these contentions, the court ruled:

We hold that under modern marketing conditions, when a manufacturer puts a new automobile in the stream of trade and promotes its purchase by the public, an implied warranty that is reasonably suitable for use as such accompanies it into the hands of the ultimate purchaser. . . . In the framework of this case, . . . the attempted disclaimer of an implied warranty of merchantability and the obligations arising therefrom is so inimical to the public good as to compel an adjudication of its invalidity.

. . . (I)t is our opinion that (the implied warranty of merchantability is) chargeable to either an automobile manufacturer or a dealer (and) extends to the purchaser, . . . members of his family, and to other persons occupying it or using it with his consent. It would be wholly opposed to reality to say that use by such persons is not within the anticipation of parties to such a warranty of reasonable suitability of an automobile for ordinary highway operation. Those persons must be considered within the distributive chain.

Thus, in this decision we see a drastic reduction of privity requirements for warranty and a significant step toward strict liability through the implied warranty of merchantability.

Warranty law, however, continues to create problems for the courts.¹⁷ Prosser states: "It gradually became apparent that 'warranty' as a device . . . carries far too much luggage in the way of undesirable complications and is more trouble than it is worth."¹⁸ The appropriate legal context for the next change was found in strict liability in tort which had been recognized for almost a century in cases of ultrahazardous or abnormal activities.¹⁹

Strict tort liability first arose in California in 1962 in the case of Greenman v. Yuba Power Products, Inc.²⁰ In this case, a combination shop tool injured the husband of the purchaser when used in a normal manner and he sued both retailer and manufacturer. The problem with warranty law in this case was twofold. First, Greenman had failed to notify the defendants within the time period prescribed by the Uniform Sales Act. Second, California had not yet recognized the provisions in Henningsen and privity remained a bar to recovery.

The court swept aside all warranty provisions by making the case one of strict liability in tort and, therefore, independent of any contract--implicit or explicit. In his opinion, Judge Traynor noted:

To establish manufacturer's liability it was sufficient that plaintiff proved that he was injured by using the (product) in a way it was intended to be used as a result of a defect in design and manufacture of which the plaintiff was not aware that made the (product) unsafe for intended use. . . . A manufacturer is strictly liable in tort when an article he places on the market, knowing that it is to be used without inspection for defects, proves to have a defect that causes injury to a human being.

The principles in Greenman were clarified in a subsequent California decision²¹ then codified in the Restatement, Second, Torts §402A which has been accepted in the large majority of jurisdictions:

Special Liability of Seller of Product for Physical Harm to User or Consumer

- (1) One who sells any product in a defective condition unreasonably dangerous to the user or consumer or to his property is subject to liability for physical harm thereby caused to the ultimate user or consumer, or to his property, if
 - (a) the seller is engaged in the business of selling such a product, and
 - (b) it is expected to and does reach the user or consumer without substantial change in the condition in which it is sold.
- (2) The rule stated in Subsection (1) applies although
 - (a) the seller has exercised all possible care in the preparation and sale of his product, and
 - (b) the user or consumer has not bought the product or entered into any contractual relation with the seller.

Comment f in this subsection summarizes the economic basis for the rule. Those who are engaged in an ongoing business have two advantages over the occasional consumer. They are more likely to know the sources and correct for defects and, when defects are unavoidable, are in a better position to insure (perhaps, self-insure).

On the issue of contributory negligence, comment n notes that the plaintiff "voluntarily and unreasonably proceeding to encounter known danger," i.e., assumption of risk, is a defense. On the other hand, "contributory negligence of the plaintiff is not a defense when such negligence consists merely in a failure to discover the defect in a product, or to guard against the possibility of its existence."

Removal of most privity requirements under warranty and all such requirements for negligence and strict tort permits an injured plaintiff to move

directly against any or all of the potentially liable parties. These may include, under negligence, any potentially negligent party or under strict tort and warranty any economic entity involved in the production or distribution of the product. The plaintiff may move against these parties in separate actions or by a joinder of the defendants.

B. Contribution and Indemnity

The law has indicated no preference over the various modes of bringing suit. Hence, the plaintiff is free to choose (1) against which of the potential tortfeasers he will maintain an action and (2), if he chooses to sue more than one, whether he will sue them jointly or individually. In any event, each tortfeaser is liable for the entire loss of the plaintiff even though there were others whose actions combined to produce the single event.²² The plaintiff may then recover damages from any of the defendants judged liable but may not recover more in total than the value of his loss. By themselves, these aspects of products liability law would introduce a significantly random element into how the liability is borne and, consequently, how each actor handles his expected costs. Two doctrines--contribution and indemnity--reduce this uncertainty by providing rules which assign ultimate liability, substantially independent of the whim of the plaintiff.

Contribution usually represents a sharing of the burden among several parties²³ and is not part of the original settlement; it is an adjustment between defendants separate from the plaintiff's claim. As such, it is commonly perceived to stem from principles of equity as opposed to being rooted in tort or contract liability.²⁴ Since the traditional common law rule is

that there should be no contribution,²⁵ in most of the approximately 40 states permitting contribution, it has come about through legislation.²⁶

These statutes typically are based to some degree on the Uniform Contribution Among Tortfeasors Act (U.L.A.) which states inter alia,

Except as otherwise provided in this Act, where two or more persons become jointly or severally liable in tort for the same injury to person or property or for the same wrongful death, there is a right of contribution among them even though judgment has not been recovered against all or any of them.

The right of contribution exists only in favor of a tortfeasor who has paid more than his pro rata share of the common liability, and his total recovery is limited to the amount paid by him in excess of his pro rata share.

In determining the pro rata shares of tortfeasors in the entire liability (a) their relative degrees of fault shall not be considered; (b) if equity requires the collective liability of some as a group shall constitute a single share; and (c) principles of equity applicable to contribution generally shall apply.²⁷

The "pro rata share" is commonly regarded to be an equal one. Each defendant is then liable for an amount equal to the total damages divided by the number of defendants.²⁸

Indemnity is the other mechanism for distributing loss among tortfeasors and is distinguished from contribution since it shifts the entire burden from one party to another.^{29,30} Since potentially the two doctrines conflict, it is worth noting that indemnity takes precedence. "When one tortfeasor is entitled to indemnity from another, the right of the indemnity obligee is for indemnity and not contribution, and the indemnity obligor is not entitled to contribution from the obligee for any portion of his . . . obligation."³¹

In the absence of explicit contract, the common law rule is that joint tortfeasors are in pari delicto and, therefore, are not entitled to indemnity

from one another.³² Since in negligence cases, strict adherence to this rule led to undesirable results when the behavior of the defendants significantly differed, the courts have attempted to establish rules based on active-passive or primary-secondary fault distinctions. Thus, if a manufacturer created a hazardous defect in a product while the retailer did not inspect for the defect adequately, the retailer's negligence in general is deemed passive. He would then be due indemnity from the manufacturer.³³ If, however, the retailer was aware of the defect and proceeded to supply the product, his negligence may not be considered passive/secondary. In warranty the issue of indemnification is the most straightforward. A manufacturer's defect, which generated a breach of implied warranty on the part of the retailer, would also be the cause of action for indemnity of the retailer against the manufacturer.

For strict tort liability, "fault" arises from the sale of the defective product, and distinctions as to degree of that sort of blame are arbitrary. The rule there is that the retailer should be indemnified by the manufacturer. The reasoning is that costs should be placed on those responsible for placing the defective product on the market.^{34,35} If, however, the retailer knows of the defect or exacerbates the condition, indemnification is not made.³⁶

Finally, parties may provide for indemnification through express contractual agreements. In general, these are enforced by the courts as long as the agreement is the clear intent of the parties. While there are exceptions,³⁷ when bargaining positions of the parties are equivalent, a contract for indemnity will be given effect by the courts and, thereby, will take precedence over the other sharing rules discussed above.

II. The Determination of Liability

How liability is shared depends on (1) the presence or absence of a privity requirement; (2) whether the product-liability rule uses the concept of negligence, warranty (including merchantability), or strict liability; (3) which concept of indemnification and contribution are given force; and (4) whether firms can avoid liability through bankruptcy.

We consider five possible allocations of liability among the consumer, the retailer, and the manufacturer. Some sufficient conditions for these five allocations of liability are presented below:

Case 1: The Consumer is Fully Liable

In the 19th and early 20th Centuries--when privity in contracts prevented the consumer from suing the manufacturer (e.g., Winterbottom v. Wright)--if the retailer could make an effective disclaimer of liability or could avoid liability through a declaration of bankruptcy, the consumer (effectively) had to bear the full liability.

Case 2: The Retailer is Fully Liable

When privity was required, if the retailer could not make an effective disclaimer or declare bankruptcy to avoid suit and the retailer could not sue the manufacturer in turn (i.e., the retailer was not indemnified or partially compensated by the manufacturer), the retailer had to bear the full liability. Since the traditional common law rule does not call for contribution, this case probably occurred frequently.

Case 3: The Manufacturer is Fully Liable

After the privity requirement was effectively eliminated or when the retailer was indemnified by the manufacturer, the manufacturer has had to bear the full liability. With the elimination of privity and the rise of strict

tort and implied warranty, the consumer often sues the manufacturer rather than (or in addition to) the retailer. So long as the manufacturer cannot obtain contribution from the retailer (whether by lack of statute or due to possible bankruptcy) and the retailer is owed indemnification from the manufacturer (whether by legal doctrine or contract), the manufacturer bears the full liability.

Case 4: The Manufacturer and Retailer
Split the Liability in Fixed Proportions

As noted above, in the post-privity period where the consumer may sue either the retailer or the manufacturer, liability sharing may depend on the rules of contribution. These rules result in equal sharing of the liability among those originally joined in the suit. Whether they include all firms will depend on whether a statute permits contribution from parties not originally listed as defendants.³⁸ In addition, the manufacturer may use incentives (such as profit sharing) to induce the retailer not to declare bankruptcy and share liability. Explicit contract clauses may be used to split the liability.

Case 5: The Manufacturer and Retailer
Conditionally Share Liability

In many jurisdictions, rules also allow the liability to be assigned in response to behavior (cf., the active-passive or primary-secondary distinctions discussed above). In particular, liability may be apportioned if the harm can be apportioned. Similarly, comparative negligence or culpability may be used to divide liability but, in general, will not shift the entire burden.

The most important example of this case arises when indemnification is based on care. Commonly, a jurisdiction requires that a retailer indemnify the

manufacturer when the retailer's involvement in the defect was active and the manufacturer's was passive; and otherwise, the manufacturer indemnifies the retailer. The active-passive distinction, then, would imply a standard of care for each. The degree, to which each one met these standards, would then determine assignment of the entire burden. This rule functions as one of "contributory negligence" but cannot be considered one technically in all cases since, for example, strict tort does not require negligence--just defectiveness. Explicit contract clauses, modifications to common law doctrine, or new legislation could create these sorts of rules.

And finally, the privity requirement in cases where parties cannot escape liability through bankruptcy is also representative of this case. Under privity with strict liability, the retailer could recover from the manufacturer if the retailer took due care and the manufacturer did not; otherwise, the retailer could not recover.

III. The Economic Model

The discussion in this section is based on a formal economic model which is contained in the Appendix. To illustrate the effects of the privity doctrine, we use a simple model in which there are competitive upstream manufacturing firms, competitive downstream retailers, and many final consumers of the product. In this section, unless we specify otherwise, we assume that the retailer cannot avoid liability by declaring bankruptcy.

The product is inherently hazardous, but the expected accident cost from its consumption (e.g., food poisoning) can be reduced by safety-related expenditures by both the manufacturer and the retailer. In general, manufacturers

may design better products, use higher quality materials, or inspect more carefully to create a superior product; while retailers may actively insure the integrity of the product, improve the product, or inspect to detect defects created in manufacturing or shipping. For example, consider a food processing industry. If manufacturers fail to maintain certain standards of cleanliness, temperature, and so forth, or retailers allow damage to the containers, defrosting, or other forms of contamination, the quality or safety of the product will be reduced.

The probability of an accident depends on the precautionary behavior of both the manufacturer and the retailer (but not the consumer). The expected cost of an accident, then, is the probability of an accident times the dollar value of the damages if the accident occurs. After an accident occurs, the courts can costlessly determine which manufacturer and retailer were involved in a transaction and the precautions each took. Firms or consumers may or may not be able to determine the precautionary behavior by others with whom they transact. We now consider how the optimal levels of safety are determined and the outcomes under the five cases considered in section II.

A. Optimal Precautions

Before examining the outcomes under various liability rules, it is useful for comparison purposes to determine the socially optimal investments in precautionary behavior by both the retailer and the manufacturer. We assume that some care by both the manufacturer and the retailer is generally optimal. Since the firms are competitive, they take wholesale and retail prices as given and earn zero expected (economic) profits. If all firms at a given

stage of production are identical, then all such firms will choose the same level of care.

Using standard economic arguments, the optimal solution is for both retailers and manufacturers to invest in safety up to the point where the marginal cost for these activities equals the marginal benefit to society (i.e., the reduction in the expected cost of the accident).³⁹ Suppose, for example, that a firm was underinvesting so that an additional dollar expenditure in more precautionary behavior would reduce the expected cost of the accident by more than \$1.00. Obviously, from society's viewpoint, the additional investment would be worthwhile.

We call these optimal investments in safety S_m^* and S_r^* for the manufacturers and retailers, respectively. At these levels of care, the sum of the cost of care by the retailer and the manufacturer and the expected cost of an accident are minimized. That is, expected social costs are minimized.

B. Consumer Liability

Under a no-liability rule, consumers are liable instead of retailers or manufacturers. Similarly, under privity, if retailers can avoid liability by going bankrupt, consumers may have to absorb accident damages. The allocation of resources under consumer liability depends on the amount of information available to the consumer prior to purchase. We will consider the allocations which would result from two extreme assumptions.

First, if the consumer has specific knowledge about all firms,⁴⁰ he will choose that product which minimizes his expected full price (price plus expected accident costs). Since at any market price, a retailer who does not purchase from a manufacturer exhibiting S_m^* and use care S_r^* himself can be

undercut by a more profitable retailer; and the market result will be efficient.^{41,42,43}

Next, if the consumer has no retailer-specific or manufacturer-specific information but knows the average level of care available, when there are many retailers and manufacturers, we have a variant of Akerlof's famous lemon problem. No individual firm is rewarded for any increase in the safety of its output. Therefore, no firm has an incentive to exercise care and $S_r = S_m = 0$.

C. Retailer Liability

We now assume that retailers know that, if an accident occurs, the consumer will certainly sue (e.g., litigation is costless) and the relevant retailer will be found strictly liable. For example, in the last century when privity in contract prevented consumers from suing manufacturers, retailers bore the full liability.

Here, the retailers' expected costs are their usual costs of doing business plus the expected cost of the accident. It obviously pays for a representative retailer to invest in precautionary activities until his expected marginal cost equals his expected marginal benefit. Since he will bear the full costs if an accident occurs, his expected marginal benefit (from reduction in the expected cost of an accident) equals the social one, that is, in this case each retailer will make the socially optimal precautionary investment given the level of safety chosen by the manufacturer.

The question remains whether the manufacturers will also make the socially optimal investment. We consider two situations: (1) the retailers can (costlessly) observe the safety level chosen by the manufacturers with whom they contract or (2) the retailers cannot observe the precautions undertaken by a particular manufacturer but can observe the average level chosen by all

manufacturers. We start by assuming that retailers can observe S_m for a particular manufacturer.

Suppose a manufacturer starts to underinvest in precautionary activities so that the expected cost of an accident rises and, hence, the retailer's expected costs rise. The manufacturer's product is no longer worth as much to the retailer (if the retailer were to continue to sell at the old retail price, the increase in his expected costs would lower his expected profits).⁴⁴

If the retailer can purchase from other manufacturers who undertake S_m^* level of precaution at the same wholesale price, the retailer will refuse to buy from the careless manufacturer. Indeed, the only condition, under which the retailer will be willing to buy from the careless manufacturer, is if that manufacturer's wholesale price were to fall by at least the amount the retailer's expected accident costs rise. By this reasoning, the manufacturer will also bear the full costs of increased expected accident costs (albeit, indirectly through a reduction in the wholesale price) so that the manufacturers will also have an incentive to make optimal precautionary expenditures.⁴⁵

When a manufacturer's safety investments are unobservable, retailers only know the average level of safety investments undertaken by manufacturers. Here, a manufacturer has no incentive to make any more safety expenditures than the average firm because he will receive the same wholesale price as all other manufacturers and have higher costs. Thus, manufacturers will be underinvesting in safety ($S_m = 0$). Retailers will be investing optimally given S_m so that their S_r may differ from S_r^* . As a result, social costs will not be minimized.

D. Manufacturer Liability

We consider next the postprivity, manufacturer liability rule. Obviously, by the arguments made above, when the manufacturer bears the full expected costs of the accident, he has an incentive to make optimal investments. What about the retailers? Again, there are two cases: (1) manufacturers can observe retailer's care and, therefore, write contracts (costlessly) with retailers that require them to maintain a given level of safety or (2) manufacturers cannot write or enforce such a contract (due to limited information about retailers' behavior or for other reasons).

If a manufacturer refuses to sell to a retailer unless they first (costlessly) contract so that, if an accident occurs and the retailer is found to have invested in less than S_r^* level of safety, the retailer will indemnify the manufacturer for the accident costs. Assuming retailers agree to such contracts, both manufacturers and retailers will choose the optimal level of precautionary expenditures by reasoning analogous to that above.

Alternatively, if such clauses are not included in their contracts, retailers realize that they bear no liability and, hence, have no incentive to invest in precautions. This case is analogous to the one above where retailers were liable and unable to observe the safety investments of manufacturers. Here, retailers will set $S_r^* = 0$; and manufacturers (behaving optimally given the retailers' decisions) may pick a S_m different than S_m^* .

E. Fixed Liability-Sharing Rules

When the privity requirement is dropped, both manufacturer and retailer potentially are joint tortfeasors in a single action. The degree to which actual liability is shared, will depend, among other things, on the decision

of the plaintiff as to whom to sue, rules of contribution or indemnity, and ex ante contractual arrangements between retailer and manufacturer.

If there is doubt as to who will be sued and if the courts do not allow defendants to join or cross-claim against potential tortfeasors not originally named in the action, there will be uncertainty as to whether each type of firm will be named as a defendant in a "typical" case. In states where contribution is permitted, each tortfeasor could expect to pay an equal share of the liability. If tortfeasors not originally joined are not liable for contribution, shares may not be equal if certain firms are more or less likely to be sued. In any event, each firm will allocate resources to safety only insofar as it affects its expected share of accident costs and not as it affects the total.

Given perfect information, the market results cited in the above cases will continue to prevail. Each party making cost-minimizing decisions has an incentive to exhibit efficient care.

If, however, neither can observe the other's level of safety directly, nonoptimal safety levels will be chosen by each. Each firm chooses a level of safety such that the marginal cost of an additional unit of safety equals the private marginal benefit from reduced accident costs. A firm's private marginal benefit depends on its share of the liability. If its share is less than one so that it cares only about a fraction of the true social costs from an accident, it will underinvest in safety, that is, fixed liability shares of less than 100 percent dilute incentives to take precautions. Indeed, both the retailer liable rules and the manufacturer liable rules are special cases where one party bears none of the social cost, so it grossly underinvests in safety. In this simple example there are only two joint defendants. But with

complex chains of commerce, the liability is further diluted and the litigation more burdensome to the courts. This is essentially the case that Epstein was criticizing.

F. Conditional Liability-Sharing Rules

As noted above, the most prevalent conditional liability-sharing rule in products liability law is that the manufacturer should indemnify a retailer who has exhibited S_r^* , otherwise the retailer indemnifies the manufacturer. With perfect information, as Posner noted, the market enforces efficient outcomes. But with asymmetric information, efficiency is restored since both types of firms now have an incentive to exhibit efficient care.

For the retailer, it is always less costly to choose a care level of S_r^* rather than choose a lower care level and bear the risk of liability. Given that the retailer chooses S_r^* , the manufacturer would bear the entire expected social costs and would choose S_m^* . Indeed, when any common-law, care-based indemnification rules are used, the efficient results under privity, generated by Posner when safety characteristics are observable ex ante, extend into settings where they are not.⁴⁶ A formal analysis of this rule may be found in the Appendix.

This rule is in the spirit of the decision in Ford Motor Co. v. Russell & Smith Ford Co., 474 S. W. 2d 549, in which the retailer was denied indemnification because he ignored and contributed to a known defect. It is also consistent with the active-passive distinctions noted above. Such a standard both provides correct retailer incentives and causes the manufacturer to internalize all costs. In fact, just as above, it is well known that rules for liability are efficient if when (1) a single party is negligent that party

bears full liability and (2) both parties are negligent or both are non-negligent, any liability assignment is made (including any ex ante probabilistic assignment of liability).⁴⁷

In the presence of the inefficient fixed sharing rule, which arises with contribution, the market response would be for retailers and manufacturers to agree to conditions for potential indemnification in the wholesale contract. Under any of the inefficient methods of sharing liability examined above, competitive retail price would be greater than minimum social cost. Thus, either manufacturer or retailer could, upon wholesale trade of the product, agree to indemnify the other only if the other has not chosen an efficient-care standard. Such a contract would induce both firms to show optimal care, joint cost would be reduced, and positive profits would be generated. In equilibrium, all firms would engage in such contracts; and retail price would be bid down to the minimum joint cost. In this case, full efficiency could be attained as long as contracting costs were low. Thus, as a matter of public policy, the courts should allow parties to contract around the provisions of contribution statutes.

In addition, the efficient equivalence of each of these liability rules demonstrates the efficiency of privity under imperfect information. Coupled with strict liability, privity implies that the retailer can recover if the manufacturer did not exhibit efficient care, otherwise not. Thus, as Epstein argues, efficiency is achieved in this case.⁴⁸

IV. Implications and Modifications of the Model

The analysis above can be extended or modified to consider a variety of other issues as well. First, where an inefficient rule is in effect, there

may be an incentive for firms to vertically integrate. Second, brand names may be used to overcome the problems discussed above which are caused by a lack of information. Third, where bankruptcy is allowed, new problems may be created.

A. Vertical Integration

One obvious solution for the manufacturer to the problem of retailers taking inadequate precautions (due to their less-than-full liability) is vertical integration. If there are no costs to integrating, a manufacturer could integrate forward into retailing. By choosing the levels of precaution at both levels of production, the integrated firm can minimize its costs of production.

As discussed above, if optimal levels of precaution are chosen at both levels, total costs will be lower than if minimal care is taken at the retail level; and extremely high levels of care are used in manufacturing to (partially) compensate. Thus, if vertical integration is costless, it does not matter whether an efficient or inefficient rule is chosen since the externalities created by an inefficient rule can be internalized through vertical integration (cf. Coase).

One fairly low-cost way to vertically integrate effectively is to require retailers to sign contracts which require retailers to maintain a given level of safety (as discussed in III-D above). Since joint costs would be lowered, the retailer could be enticed into such a contract by a lower wholesale price. Competition over such contracts ultimately would force retailer and manufacturer care and retail and wholesale prices to efficient levels.

In most cases, there will be substantial costs to integrating due to greater organizational problems, legal fees, or a variety of other factors.⁴⁹ In this more general case, it will pay for a manufacturer to vertically integrate if the extra profits from greater precautions at the retailer level offset the costs of integrating. Here, vertical integration is not a perfect substitute for an efficient rule.

B. Brand Names

In our analysis in section III, several times we noted that problems arose when consumers or retailers could not identify the "guilty" party. In contrast, efficiency was achieved when consumers or retailers knew which firm sold them the defective product. Brand names, which help to identify firms and products, may eliminate the lack of information problem and thereby lead to efficiency under a wide variety of rules.

Where all firms remain small and all firms produce a safe product (due to the information generated by the brand names), this approach may be unambiguously desirable. Alternatively, if the brand names lead to (possibly spurious) product differentiation, firms may gain some monopoly power which may offset the efficiency gains from identifying products.⁵⁰

C. Bankruptcy

Where firms can avoid liability by declaring bankruptcy, they will tend to underinvest in care. Thus, where bankruptcy is possible, we would expect to see nonoptimal outcomes.

The effects of bankruptcy in this setting have been extensively analyzed in an earlier paper.⁵¹ Where firms have some monopoly power, it may be possible to offset the effects of bankruptcy by requiring firms to buy

insurance policies or to post bonds. For example, a manufacturer could require retailers to post bonds as a precondition to receiving a franchise to sell the manufacturer's product.⁵²

V. Summary and Conclusions

We have argued that privity and contribution rules interactively determine liability, which, in turn, determines whether the social costs of accidents are minimized. Our results concerning efficiency are summarized in the following table. Basically, where there is limited information at the time of contracting, all the liability rules considered lead to inefficient outcomes where either the retailer or the manufacturer (or both) underinvest in safety precautions.

Laws and precedents (e.g., those concerning indemnification), which create a type of "comparative negligence" rule, lead to efficiency if the courts can costlessly determine care levels after the accident. Where firms can observe safety precautions of other firms after an accident, firms should be able to contract to eliminate inefficiencies (i.e., internalize the externality created by bad laws). Hence, under full information, all the rules considered are efficient.

Brand names, by creating reputations for firms, can lead to full information and efficiency. Similarly, by internalizing decision making, vertical integration can lead to efficiency under any of the rules.

In contrast, by making firms judgment-proof, bankruptcy leads to inefficiency under any of the rules. To the extent that retailers are more likely to avoid liability through bankruptcy than are manufacturers, the elimination of the privity requirement may be socially harmful from an efficiency viewpoint.⁵³

Table
Efficiency Under Various Legal Rules, Conditional on Information

	Information at time of contracting:	
	Limited information/ no contingent clause contracts (e.g., anonymous firms in spot markets)	Full information/ contingent clause contracts (e.g., branded goods)
<u>Legal rule:</u>		
Consumer liable	Inefficient: $S_R = S_m = 0$	Efficient: $S_R = S_R^*$ $S_m = S_m^*$
Retailer liable	Inefficient: $S_R > S_R^*$ $S_m = 0$	Efficient: $S_R = S_R^*$ $S_m = S_m^*$
Manufacturer liable	Inefficient: $S_R = 0$ $S_m > S_m^*$	Efficient: $S_R = S_R^*$ $S_m = S_m^*$
Arbitrary splitting rule	Inefficient: $S_R < S_R^*$ $S_m < S_m^*$	Efficient: $S_R = S_R^*$ $S_m = S_m^*$
Conditional splitting rule	Efficient: $S_R = S_R^*$ $S_m = S_m^*$	Efficient: $S_R = S_R^*$ $S_m = S_m^*$

Note: For specificity, we assume that S_R and S_m are complements (see the Appendix).

One can note from our analysis that the works of both Posner and Epstein are correct as far as they go. In the Posner case of perfect information, all property rights are effectively assigned; and the market works.⁵⁴ The role of privity, strict liability and negligence, and sharing rules are, at most, redundant and usually irrelevant. In Epstein's imperfect information case, the orderly working of a privity system would (perhaps in a sequence of cases) assign liability efficiently. We show, however, that without privity and under the most common rule for indemnification, efficiency is also attained. And, in the presence of an inefficient sharing rule, there exist incentives to negotiate contacts which promote least-cost behavior.

APPENDIX

The Model

In this Appendix we use a simple model of competitive industries to examine the issues discussed above. Here, we restrict ourselves to the case where no actor has information about the care levels of any other firm.

There are many identical consumers who each inelastically demand one unit of the product. Each individual has a utility function (conditional on the consumption of one unit) which is increasing over net income:

$$U = U(Y - P) \quad (1)$$

where Y is the exogenously given income, P is the cost of one unit, and $U' > 0$ and $U'' < 0$ (because consumers are risk averse).

The product is assumed to be inherently hazardous, but the expected accident cost from its consumption (e.g., food poisoning) can be reduced by safety inputs at the manufacturing (S_m) or distributional (S_r) levels. Units are chosen for S_m and S_r such that the price of each input is \$1.00. Since the economy is composed of many risk-averse individuals, efficiency requires the pooling of risk and, consequently, entails the maximization of the utility of expected net income of the typical individual which from (1) implies

$$\text{Max}_{S_m, S_r} U[Y - L(S_m, S_r) - S_m - S_r] \quad (2)$$

where $L(\cdot, \cdot)$ is the expected cost of an accident.

We assume that L is decreasing in its arguments and is strictly convex.⁵⁵ Note that L is a function only of care per unit; production is, therefore, subject to constant returns to scale. The first-order conditions for the problem posed in (2) imply that

$$-L_1 = -L_2 = 1 \quad (3)$$

or that the marginal benefits of safety inputs to expected accident cost reduction equal respective marginal costs. We can solve the conditions in (3) for the optimal due-care standards, S_m^* and S_r^* .

Both the wholesale and retail markets are competitive,⁵⁶ and all firms are risk neutral. Each firm then maximizes its expected profit taking the wholesale price, q ; the retail price, p ; and the care of others as given.

No firms or consumer can observe the safety precautions of others, but they each do know the market averages of manufacturer and retailer care, \bar{S}_m and \bar{S}_r , respectively. The courts are assumed to be able to determine S_m or S_r following an accident. As discussed in the second section, legal rules determine manufacturer and retailer liability shares.

Given the relative attitudes toward risk of each of the parties, rules other than strict tort liability will be inefficient and will not be considered.⁵⁷ Under strict liability, the manufacturer and retailer share the total liability; as such, we will denote the share of retailer liability as θ and the manufacturer's as $1 - \theta$. Since constant returns to scale imply maximizing profits per unit, the problem for the typical retailer becomes

$$\text{Max}_{S_r} p - q - \theta L(\bar{S}_m, S_r) - S_r, \quad (4a)$$

and for the typical manufacturer

$$\text{Max}_{S_m} q - (1 - \theta) L(S_m, \bar{S}_r) - S_m. \quad (4b)$$

With prices taken as given, the problem reduces to unit cost minimization or

$$\text{Min}_{S_r} \theta L(\bar{S}_m, S_r) + S_r \quad (5a)$$

and

$$\text{Min}_{S_m} (1 - \theta) L(S_m, \bar{S}_r) - S_m, \quad (5b)$$

respectively.

In a Nash equilibrium, prices will have adjusted until zero profits prevail. Further, given their identical nature, all firms of either type will exhibit the same care, i.e., $\bar{S}_m = S_m$ and $\bar{S}_r = S_r$ for all firms. We will first consider efficiency properties of market equilibria under privity and compare them with various outcomes when privity is abandoned.

For any θ set without a condition on the agents' behavior, inefficient results will prevail. Solution to equations (5) implies

$$-(1 - \theta) L_1 \leq 1 \quad (6a)$$

$$-\theta L_2 \leq 1. \quad (6b)$$

From (3), it is clear that attaining (S_m^*, S_r^*) in the market requires that both firms bear full liability in the fixed share case, while an examination of equation (6) indicates that no optimal values result from a fixed splitting rule, θ .

For example, with privity implying that the consumer has direct legal recourse against only the retailer, $\theta = 1$ unless the retailer can successfully cross-claim against the manufacturer. If he cannot, (6a) indicates that the manufacturer will set $S_m = 0$ since his individual care is not observable ex ante at low cost. This equilibrium is clearly inefficient.⁵⁸

If, on the other hand, indemnification by the manufacturer were automatic, the situation would be reversed. If $\theta = 0$ from (6b), S_r would equal zero. Again, the result would deviate from (S_m^*, S_r^*) .

While the strict liability of firms dealing regularly in the product is not based on either warranty or negligence, a care-based rule for indemnification among strictly liable firms is required for efficiency. While strict liability efficiently distributes risk, fixed liability shares dilute incentives. The appropriate rule will be of the following sort: establish S_r^* , S_m^* as due-care standards; liability shares, when both firms meet the standard and when they do not, may be arbitrarily chosen and need not be the same; a retailer whose care is at least S_r^* may obtain indemnification from a manufacturer whose care is less than S_m^* ; a retailer whose care is less than S_r^* may not obtain indemnification from a manufacturer whose care was at least S_m^* .⁵⁹ With any rule from this class, neither firm would fail to exhibit due care when the other did meet the standard. Cost minimization conditional on the assumption of liability would imply

$$\text{Min}_{S_r} L(S_m^*, S_r) + S_r \quad (7a)$$

for the retailer, or

$$\text{Min}_{S_m} L(S_m, S_r^*) + S_m \quad (7b)$$

for the manufacturer; and firms would generate the same care levels given by the optimality equation (6), i.e., S_r^* and S_m^* , respectively.

We can similarly reject the possibility that both firms would choose levels of care less than the due care standards. If so, there would be S_r^i, S_m^i such that both

$$\theta_2 L(S_m^i, S_r^i) + S_r^i < S_r^* < L(S_m^*, S_r^*) + S_r^* \quad (8a)$$

and

$$(1 - \theta_2) L(S_m^i, S_r^i) + S_m^i < S_r^* < L(S_m^*, S_r^*) + S_m^*. \quad (8b)$$

Adding (8a) and (8b) while eliminating the middle term of the inequality yields

$$L(S_m^i, S_r^i) + S_r^i + S_r^i < L(S_m^*, S_r^*) + S_m^* + S_r^*$$

which contradicts the assumption that S_m^*, S_r^* minimizes total accident costs.⁶⁰

On the other hand, S_m^*, S_r^* is clearly an equilibrium. It is true that

$$(1 - \theta_1) L(S_m^*, S_r^*) + S_m^* \leq L(S_m^*, S_r^*) + S_m \quad \text{for all } S_m,$$

just as

$$\theta_1 L(S_m^*, S_r^*) + S_r^* \leq L(S_r^*, S_r^*) \text{ for all } S_r^*.$$

Thus, when common-law, care-based indemnification rules are used, the efficient results under privity, generated by Posner when safety characteristics are observable ex ante, extend into settings where they are not.

In cases where care levels are inefficient, it is not necessarily the case that care is deficient. A sufficient condition for both retailer and manufacturer liability to be less than optimal when liability is shared is that the sign of L_{12} be negative. If $L_{12} < 0$, inputs to care can be considered as complements in production. When a firm's liability share is decreased, it reduces one firm's incentive to enhance the marginal benefit of the activity.⁶¹ The rule that the retailer should be indemnified by the manufacturer sets $\theta = 0$ which implies $S_r = 0$ as noted above. Unless the impact of the two types of care on expected loss are strictly additive, care levels will be inefficient with retailer care being deficient.

Footnotes

¹See, e.g., Richard A. Posner, Economic Analysis of the Law at 92-93 (1973) and Roland McKean, Product Liability: Implications of Some Changing Property Rights, 84 Quarterly Journal of Economics 611 (1970).

²Op. cit.

³Richard Epstein, "The Legal and Insurance Dynamics of Mass Tort Litigation," mimeo (1983).

⁴10 M & W 109, 152 Eng. Rep. 402 (1842).

⁵Thomas v. Winchester, 6 N. Y. 397 (1852).

⁶For food, Tomlinson v. Armour & Co., 75 N. J. Law 748 (1908). For beverages, Jackson Coca-Cola Bottling Co. v. Chapman, 106 Miss. 864 (1914); Boyd v. Coca-Cola Bottling Co., 132 Tenn. 23 (1914). For drugs, Blood Balm Co. v. Cooper, 83 Ga. 457 (1889). For firearms, Herman v. Markham Air Rifle Co., 258 F. 475 (6th Cir. 1918). For explosives, Peterson v. Standard Oil Co., 55 Or. 511 (1910). For tobacco, Liggett & Myers Tobacco Co. v. Cannon, 132 Tenn. 419 (1915); Pillars v. R. J. Reynolds Tobacco Co., 117 Miss. 490 (1918). For construction equipment, Devlin v. Smith, 89 N. Y. 470 (1882); Loop v. Lichfield, 42 N. Y. 351 (1870).

⁷William L. Prosser, The Law of Torts 642 (4th ed., 1971).

⁸217 N. Y. 382, 011 N. E. 1050 (1916).

⁹For production, this rule is adopted in the Restatement of Torts, 2nd, §395.

A manufacturer who fails to exercise reasonable care in the manufacture of a chattel which, unless carefully made, he should recognize as involving an unreasonable risk of causing physical harm to those who use it for a purpose which the manufacturer should expect it to be used and to those whom he should expect to be endangered by its probable use, its subject to liability for physical harm caused to them by its lawful use in a manner and for a purpose for which it is supplied.

¹⁰For design, the rule in the Restatement of Torts, 2nd, §398:

A manufacturer of a chattel made under a plan or design, which makes it dangerous for the uses for which it is manufactured, is subject to liability to others whom he should expect to use the

chattel or to be endangered by its probable use for physical harm caused by his failure to exercise reasonable care in the adoption of a safe plan or design.

¹¹Restatement of Torts, 2nd, §396.

¹²Warranty law is tied to contract and, as such, is governed by sales law rather than tort law where it had its origins. Warranties can be of two types, express and implied. Under the Uniform Commercial Code §2-313, an express warranty may come about in any of three ways. An explicit statement or promise relating to the goods in question, a description of the goods which is part of the basis for the bargain, and a sample or model of the good in question which is represented as typical each create an express warranty. Implied warranties arise in two ways. First, a product must be merchantable, i.e., it must come up to the standards of professionals producing similar items. Second, it must pass a fitness test, i.e., that the goods be fit for such purposes as the seller might reasonably expect them to be put.

¹³Mazetti v. Armour & Co., 75 Wash. 622 (1913).

¹⁴Prosser, supra, §97.

¹⁵32 N. J. 358 (1960).

¹⁶Since the car was "so badly damaged that it was impossible to determine if any (aspect of the car was) defective . . . prior to the accident," negligence could not be used.

¹⁷Personal injury remained a problem. Further, in the Uniform Commercial Code (§2-318) and the Uniform Sales Act, there remained remnants of privity and other complex requirements.

¹⁸Prosser, supra, §98.

¹⁹Rylands v. Fletcher, 3 H. & C. 774 (1868).

²⁰59 Cal. 2d 57 (1962).

²¹See Vandermark v. Ford Motor Company. 61 Cal. 2d 256 (1964). There the plaintiffs sued both manufacturer and dealer to recover personal injury damages sustained when the brakes on a car they had purchased failed. It appears that, while the car may have been safe when it left Ford's physical control, the defect may have been induced by the dealer's altering of component parts. Ford based its case on the dealer's negligence and the dealer on a liability disclaimer. The court ruled:

These (strict liability principals) focus responsibility for defects, whether negligently or non-negligently caused, on the manufacturer of the completed product and they apply regardless of what part of the manufacturing process the manufacturer chooses to delegate to the third parties. . . . (Therefore, Ford) cannot escape

liability on the ground that the defect in the Vandermark's car may have been caused by something one of its authorized dealers did or failed to do. . . .

(However), retailers like manufacturers are . . . in the business of distributing goods to the public (and) may play a substantial part in insuring that a product is safe. . . . Strict liability on manufacturer and retailer alike afford maximum protection to the injured plaintiff and works no injustice to the defendants for they can adjust the costs of such protection between them in the course of their continuing business relationship.

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

²²This is not the case, of course, under negligence actions in these jurisdictions permitting comparative negligence.

²³See American Auto Insurance Co., v. Molling, 57 N. W. 2d 847 (1953).

²⁴See Stradley v. Capital Transit Co., 87 F. Supp. 94 (1949).

²⁵Merryweather v. Nixon, 101 Eng. Rep. 1337 (1799).

²⁶Victor E. Schwartz, Comparative Negligence (1974, 1978 Supp.).

²⁷Uniform Contribution Among Tortfeasors Act (U.L.A.) 1(a), 1(b), 2.

²⁸There seems to be a residual random element remaining in contribution statutes. The size of any settlement is determined by the active parties to any suit. Hence, a potential tortfeasor not joined in the original suit may oppose and have been able to alter a settlement agreed to by those joined as defendants. If, however, he is not liable for a share, expected settlement costs are to some degree again subject to the plaintiff's whim. This problem is inherent. Some two-thirds of states with contribution statutes have opted to include as liable for contribution tortfeasors not joined, while the remaining third include only the original defendants.

²⁹Prosser, supra, 50.

³⁰Also unlike contribution, indemnity has its origins in either explicit or implicit contractual duty. A well-known statement of this distinction is made in McFall v. Compagnie Maritime Belge, 304 N. Y. 314 (1952).

³¹Uniform Contribution Among Tortfeasers Act (U.L.A.) 1(f). See also Dole v. Dow, 30 N. Y. 2d 143 (1972); Craven v. Lawson, 534 S. W. 2d, 653 (1976).

³²Sylvestri v. Warner & Swasey Co., 398 F. 2d 598 (1968).

³³General Accident, Fire & Life Assurance Corp. Ltd. v. Goodyear Tire & Rubber Co., 132 F. 2d 122 (1942); Tromza v. Tecumseh Products Co., 378 F. 2d 601 (1967). For an exception, see Kenyon v. F.M.C. Corp. 286 Minn. 283 (1920).

³⁴Farr v. Armstrong Rubber Co., 288 Minn. 83 (1970).

³⁵Accordingly, manufacturers are sometimes indemnified by the producers of faulty components parts. See Tromza v. Tecumseh Products Co., 378 F. 2d 601 (1967).

³⁶Ford Motor Co. v. Russell & Smith Ford Co., 474 S. W. 2d 549 (1972).

³⁷The courts appear unwilling to force one party to indemnify another under circumstances in which damages from the potential indemnitee's own active negligence (unless that was the clear intent of the parties). In addition, overly general agreements tend to be struck down. The Gray Line Co. v. Goodyear Tire & Rubber Co. 280 F. 2d (1960); Price v. Shell Oil Co., 2 Cal. 3d 245 (1970). These positions make ambiguous whether a manufacturer's disclaimer of duty to indemnify the retailer is valid since the agreement is general, and it is not clear what the relative bargaining positions of the two parties are. (For pro, Williams v. Chrysler Corp., 148 W. Va. 655 (1964); for contra, Ford Motor Co. v. Tritt, 244 Ark. 883 (1968).

³⁸See footnote 26 supra.

³⁹We assume throughout that all firms and consumers are risk neutral.

⁴⁰Alternatively, we could assume that consumers have specific information about retailers and retailers have specific information about manufacturers.

⁴¹Marilyn J. Simon, "Imperfect Information, Costly Litigation, and Product Quality," 12 The Bell Journal of Economics 171 (1981) shows how in such a model multiple price equilibria can occur where some firms charge high prices for a same product, while others charge low prices for a less safe product.

⁴²Either of these cases, however, produce inefficient results for the risk averse consumer. In both cases, given S_m and S_r , the risk of loss is borne by the most risk averse party, a case of distributive inefficiency. (This observation also holds true under a negligence rule such as would have prevailed post-MacPherson but pre-Henningsen and pre-Greenman.) And, in the case in which care is observable, the consumer will have a positive risk premium at S_m^* and S_r^* . In the absence of a competitive market for insurance against this loss, the market will translate this premium into excessive levels of care.

⁴³As is discussed in more detail in the Appendix, we assume that each consumer purchases exactly one unit of the good and that the retail price consumers will pay is determined by their utility function. If the retail price were to rise, consumers would stop purchasing altogether. Thus, we assume here that the retail price is fixed.

⁴⁴This argument assumes that the retailers' technology is Leontief with respect to the expected accident costs and the wholesale price. That is, there is no interaction between the retailers' nonprecautionary inputs and expected accident costs. This assumption is maintained below. The assumption is qualitatively innocuous. Inefficiencies of substitution would result if perfect substitutes do not exist.

⁴⁵Posner, op. cit.

⁴⁶See John P. Brown, "Toward an Economic Theory of Liability," 2 J. Legal Studies 323 (1973) for an analysis of these rules.

⁴⁷Ibid.

⁴⁸See Epstein, op. cit.

⁴⁹See, for example, Oliver Williamson, "The Vertical Integration of Production: Market Failure Considerations," 61 American Economic Review 112 (1971).

⁵⁰An analogous model under monopoly is presented in Marilyn J. Simon, Robert G. Wolf, and Jeffrey M. Perloff, "Product Safety, Liability Rules and Retailer Bankruptcy," mimeo (1983).

⁵¹Ibid.

⁵²The properties of this sort of arrangement are examined in Robert G. Wolf, "Product Safety, Bankruptcy, and Franchising the Retailer," mimeo (1983).

⁵³Cf. Judge Cardozo's analysis in MacPherson v. Buick Motor Co. in which he develops a "deep pockets" argument.

⁵⁴In another analysis, McKean, supra, interprets the succession of MacPherson, Henningsen, and (implicitly) Greenman as a transfer of property rights and a move to a less efficient outcome. He notes neither the consumer's contributory negligence provision under strict tort (Restatement of Torts, 2d, §402A, comment n) nor the consequence of liability sharing. When viewed from this broader legal perspective, the evolution of products liability law is not a shift of rights but a change in the rules under which they are exchanged. As noted, this change may increase efficiency from an original (post-Winterbottom pre-MacPherson) position of caveat emptor.

⁵⁵Strict convexity is a sufficient second-order condition for the optimization problem and implies that increased safety inputs decrease expected loss but at a decreasing rate. Note that this assumption is not as strong as the restriction on the sign of L_{12} used by Brown, supra.

⁵⁶The assumption of competitive markets is included for expositional clarity. All of the propositions of this paper stand when the manufacturer is a monopolist: see Simon, Wolf, and Perloff, supra.

⁵⁷While it may be argued that pure strict liability is inefficient in the more general case in which the consumer has impact on L, such a problem can be corrected by imposing a contributory negligence requirement on a potential plaintiff as is done in Restatement of Torts, 2nd, §402A, Comment n.

⁵⁸While the manufacturer will produce too little safety, the retailer's response given in (5b) may produce too little or too much: see below.

⁵⁹While strict liability is not based on negligence or warranty, these represent the set of common law care based rules as reviewed by John B. Brown, supra, note 36.

⁶⁰This proof has been generated in a different setting in William M. Landes and Richard A. Posner, "Joint and Multiple Tortfeasors: An Economic Analysis," 9 J. Legal Studies 517 (1980).

⁶¹Comparative statics analysis of the problem indicates

$$\frac{\partial S_r}{\partial \theta} = \frac{-(1 - \theta)L_2L_{11} - \theta L_1L_{12}}{\theta(1 - \theta)(L_{11}L_{22} - L_{12}^2)}$$

and

$$\frac{\partial S_m}{\partial \theta} = \frac{\theta L_1L_{22} + (1 - \theta)L_2L_{12}}{\theta(1 - \theta)(L_{11}L_{22} - L_{12}^2)} .$$

Denominators of both are positive because of the convexity property of L. Hence, L_{12} being negative is sufficient for each firm to reduce care as liability is reduced. It is possible if L_{12} is sufficiently large (S_m and S_r are strong substitutes) for reduction in liability to increase care.