products liability. Products liability has become an increasingly prominent component of the legal system. Products liability costs have escalated as the potential bases for firms’ liability have expanded. Changes in legal doctrine, such as the emergence of a design defects test and the strict liability doctrine, have contributed to this phenomenon. However, the shifting character of litigation is no doubt responsible as well. Perhaps the most noteworthy development in the United States has been the emergence of mass toxic torts. The costs associated with mass torts are so substantial that they have led to the reorganization of many US firms and contributed to the financial woes of Lloyd’s of London.

Much of the public interest in products liability has been stimulated by anecdotal evidence of the powerful effects of liability incentives. Motels removed diving boards from their swimming pools to reduce liability costs. US pharmaceutical companies discontinued manufacturing vaccines and withdrew contraceptive products in the face of the liability burden. Publicity given to million dollar lawsuits has also attracted popular attention.

The increased prominence of products liability is not simply a media-created phenomenon. Products liability lawsuits in the US Federal Courts increased sixfold from 1975 to 1989. Median verdicts have escalated, as have liability insurance premiums. This essay explores the functioning of the current liability system and reviews some of the empirical evidence regarding societal effects.

I. LIABILITY TRENDS. Much of the attention devoted to products liability in the literature of law and economics has stemmed from the gigantic escalation of liability costs in the 1980s. The escalation of liability premiums from 1984 to 1986, in particular, led the popular press to designate the situation as a ‘liability crisis’. More recently, although premiums remain high their percentage growth has dropped, leading to liability costs at a continued high level. Examination of the nature of the upsurge in liability costs and its timing is instructive in assessing the rising role of products liability. Much of the current prominence of products liability reform is attributable to the mid-1980s liability insurance crisis. However, how severe was this crisis, and to what extent was it caused by the structure of products liability law?

One alternative hypothesis is that the crisis was not one of law but of economics. According to this view, high insurance rates arose because of the underlying cycle. When interest rates are high, as they were in the early 1980s, insurance firms were willing to write policies for which the ratio of expected losses to premiums is high. Such potentially unattractive policies can be profitable if interest rates are sufficiently high that the company can earn enough interest on the premiums to earn a reasonable profit before the losses are incurred. Although this interest rate explanation has contributed to some of the rise in premiums, it is only a small part of the story.

The second hypothesis is that the liability crisis was a rate making conspiracy. By this reasoning, the insurance firms colluded to raise premium rates and simply blamed liability costs as a justification for their attempt to reap monopoly profits. Given that there were 3,800 companies

privity. See LAND-USE DOCTRINES.

procedural justice. See RULE OF LAW.
writing property and casualty insurance in the United States in 1988, this industry collusion hypothesis is highly improbable. Moreover, it ignores the fundamental shifts that occurred both in the performance of liability insurance markets and in patterns of litigation.

Before considering the trends in liability in detail, it is useful to inquire whether there are underlying risk factors that might have generated a surge in liability. Put somewhat differently, is the world a riskier place? Risks of all kinds have been declining throughout this century as indicated in National Safety Council (1988) data. The only exception is that of motor-vehicle accidents, which increased in the United States with the arrival of the interstate highway system and the increased numbers of the driving population. However, after adjusting for miles driven and the number of drivers, even these accident rates are down. Over the decade ending in 1977, which as will be seen is the key period for the products liability crisis, accident rates declined by 20% overall, 11% for motor vehicles, 25% for work accidents, and 26% for home accidents.

What has also changed, however, is society's affluence. Preferences for safety increase with societal income levels. As we have become more affluent, we demand greater levels of safety from all products and activities. These effects of higher income levels are reflected in the advent of the wave of risk and environmental regulations over the past quarter of a century.

The surge in the role of liability likewise may be a reflection of increased societal concerns with safe products. There were 7,677 personal injury products liability cases that commenced in the Federal Courts in 1984. This number increased to 12,507 by 1985, reaching a high of 16,166 in 1988. By comparison, there were only 2,393 such cases in 1975.

This surge in liability for accidents does not reflect simply the overall increase in the litigiousness of US society which affects all areas of litigation. Products liability has in fact assumed an increasingly prominent role in litigation. As a percentage of all Federal civil cases, products liability cases increased from 2.6% in 1984 to 6.73% by 1988. Within a four-year period, the percentage of products liability cases among all civil cases in the US Federal Court system more than doubled. The surge in liability costs was not simply an illusion created by insurance companies but was a reflection of a real increase in the role of litigation.

The increase in products liability litigation has not, however, been uniform for all kinds of products liability cases. One outlier in the litigation increase has been the surge in asbestos cases (see Viscusi 1996). Asbestos exposures to shipyard workers, workers who installed asbestos insulation, and other exposed worker groups produced cases of cancer that ultimately led to products liability litigation. The surge in litigation was dramatic. In 1975, only two percent of all products liability cases in the Federal Courts were asbestos-related, but by 1987 the majority of them pertained to asbestos suits. These cases have ultimately worked their way through the system so that asbestos cases now constitute a minority of the Federal products liability cases. The rise in insurance premiums that took place in the mid-1980s consequently was due at least in part to the underlying shifts in liability.

The subsequent rise in premium costs for general liability insurance was unprecedented in terms of the concentrated nature of the premium increase. In 1984 general liability premiums were $6.5 billion. These premiums increased by over 78% in 1985 and by 68% in 1986 before stabilizing at a level above $20 billion in 1987. Put somewhat differently, premium levels increased by a factor of 2.9 within a two-year period.

The time period in which the surge in insurance premiums occurred provides information that can be used in assessing shifts in liability which were most likely to have caused the increase in costs. Premiums increased most rapidly in the 1970s and 1980s. Whereas the annual percent increase in premiums was 6.5% from 1958 to 1968, it was 19.1% from 1968 to 1978 and 11.4% from 1978 to 1988. This last decade included a time interval with the most temporally concentrated increase in premiums, but there was actually a greater rise in premiums over the entire 1968–1978 period.

The timing of these manifestations of a liability crisis is instructive. If it had been §402a of the Restatement of the Law of Torts in the 1960s that was the instrumental factor through its articulation of strict liability, then one would have expected the decade of the 1960s to be the critical period (see American Law Institute 1965 and Epstein 1980). Similarly, the articulation of the design defect doctrine in the 1960 Henningens decision apparently was not a pivotal event either. What seems to have been more consequential were the subsequent developments, which included the advent of mass toxic torts in the asbestos litigation, the development of the design defect doctrine, and hazard warnings cases.

Another manifestation of the role of liability costs is that they adversely affect the value of the firm. These stock market effects are often substantial. The studies in the literature have focused on the effect of reports of jury verdicts and other legal events on stock prices. In many instances, there are multiple price effects of the litigation. The initial announcement by A.H. Robins of the Dalkon Shield litigation led to an $18.3-million adverse effect on the value of the firm. This was followed by a subsequent $49.2-million loss once the number of suits had risen to 547, and an additional $6.1-million loss after a filing of a suit for damages for 'loss of right to natural childbirth'.

As Schuck (1986) has shown, the Agent Orange litigation involving Vietnam veterans who sued chemical companies for a variety of ailments stemming from their herbicide exposures during the Vietnam war created major problems in the US Courts due to the scale of the litigation. It also led to a series of major financial effects that reflected the changing character of the litigation events. Consider, in particular, the effects found by Viscusi (1991) on the largest Agent Orange producer, Dow Chemical Company, for a ten-day period surrounding different news events. The filing of the initial class action suit led to a $51-million loss, which was followed by an additional $179-million loss once the judge ruled that Federal common law applied to the case. A report in the Wall Street Journal on 30 May 1980 of a $310-million Agent
Orange suit led to an additional $221-million stock market loss, and a follow-up story on 10 July 1980 produced an additional $97-million loss. When the final decision that was relatively favourable to the companies was announced, there was a $301-million increase in the value of the firm.

2. LITIGATION DATA. One measure of the extent of the role of products liability in the US is the number of cases litigated in the courts, where Federal court data are the most widely available. Such assessments are, however, likely to be biased in that they focus only on cases that go to court and not on cases settled out of court.

The focus on court cases consequently dramatically understates the extent of the liability burden. For one large sample of closed products liability claims, 19% of the claims were dropped. If the claim was not dropped, 95% of these claims were then settled out of court, with only the remaining 5% reaching a court verdict. Focusing on trends in court verdicts consequently understates the total magnitude of the liability burden. Moreover, to the extent that incentives to settle claims change over time, perhaps as a result of more well-defined liability doctrines or a fear by companies of punitive damages, then such shifts in the willingness to settle claims will also affect the mix of claims and the number of claims taken to court verdict. Court verdicts will consequently provide a very misleading picture of the overall role of liability since they represent only a tiny minority of the liability claims in which there is a payout.

In the case selection models developed to analyse the litigation process, researchers such as Priest and Klein (1984) have hypothesized that there will be a 50-50 split in the cases brought to trial between the plaintiff and the defence. Each party should anticipate its prospects of going to trial so that the only cases that will be litigated will in effect represent a random error in these expectations. This result assumes that the parties are situated symmetrically. What the plaintiff gains, the defendant loses. One explanation for the observed discrepancy from the 50-50 split is that the stakes for the two parties may not be symmetric. Corporate defendants run the risk of losing similar cases as mass marketed consumer products are involved. Because of this asymmetry, firms will be more willing to settle cases than they otherwise would, thus settling cases in which the plaintiff’s prospects for success are relatively low. The result is that the cases that ultimately are litigated will tend to be those in which the plaintiff’s prospects are not high, which is a possible explanation for the observed 37% plaintiff success rates in product liability litigation.

The dangers that case selection effects pose for examining litigation statistics are apparent if one focuses on particular industries that have been the target of litigation. The pharmaceutical industry accounted for an overwhelmingly disproportionate share of the liability costs through the 1980s. After that period, however, there has been a dramatic drop in Federal litigation involving pharmaceutical companies and in the total verdicts affecting pharmaceutical companies. These shifts should not necessarily be viewed as a sign of decreased liability costs, but instead may indicate that the industry has adopted a pattern of settling cases rather than risking the uncertain-

3. CHANGES IN LIABILITY DOCTRINE. One major shift in liability doctrines applied to products liability cases was the emergence of strict liability. This doctrine shifted much of the responsibility for accident costs to producers, the underlying rationale being that producers could act as insurers by spreading the costs of the accident across consumers through higher product prices (see Epstein 1980 and Schwartz 1988).

This concept works well with respect to isolated manufacturing defects, but is less viable for the kinds of liability that have emerged over the past two decades. Other shifts in the legal system have generated a situation in which risks to the firm are no longer independent and identically distributed events. In the presence of highly correlated risks, it is not always feasible for a company to spread these costs across consumers. Moreover, if companies are assessed the liability bill that is unanticipated at the time the products were sold, then it is not feasible to recoup such retroactive liability costs. Producers of private planes, for example, cannot go back to the original customers and impose a cost surcharge for the rise in liability costs that they have experienced. The cost that can be done is to raise the price of current planes to cover prospective liability costs associated with those planes. Unanticipated liability costs will consequently be a net loss to the firm.

A fundamental shift in the character of liability occurred with the emergence of design defect tests. Rather than focusing on whether a product had isolated manufacturing defects, the courts have turned to whether the products themselves were defective in design. Thus, the whole product line may be at risk once the design has been found to be defective.

The design defect tests evolved in the 1970s and 1980s.
A guiding principle for judging whether a design is defective is the risk–utility test developed by Dean Wade (1973). From an economic standpoint, the risk–utility test should be a form of benefit–cost analysis. Do the benefits to the user of an improved safer design exceed the costs of providing such a safer design? If this condition is met, then the firm should be liable for an inadequate level of safety.

The actual risk–utility doctrine is not as tightly specified as a formal benefit–cost test. Rather, it asks the jurors to consider factors such as the ‘usefulness and desirability of the product’, ‘the safety aspects of the product’, ‘the availability of a substitute product’, ‘the manufacturer’s ability to eliminate the unsafe character of the product’, ‘the user’s ability to avoid danger by the exercise of care’, ‘the user’s anticipated awareness of the danger’, and ‘the feasibility, on the part of the manufacturer, of spreading the loss’. There is, however, no formal guideline that has been provided for tallying effects with respect to these different factors to yield a comprehensive assessment of the desirability of the firm’s action.

Product risks that affect an entire product line have been particularly influential in driving up the costs of the pharmaceutical and medical device industry. The Copper-7 contraceptive device was a major target of litigation, leading to discontinuation of the product by G.D. Searle and Company. Most US manufacturers of the major childhood vaccines have left the market, leaving these markets to single product monopolies. More generally, the National Academy of Sciences (1990) noted that tort liability was a principal factor in contributing to the United States being a decade behind Europe in the development of contraceptive device.

4. HAZARD WARNINGS. Another major expansion in the range of product-related characteristics that could serve as the basis for liability suits is the emergence of hazard warnings cases. Even in a situation in which a product did not have a manufacturing defect or a defective design, it was nevertheless possible for plaintiffs to find the company liable if the warnings provided with the product were not adequate.

From an economic standpoint, the role of warnings is a constructive one in that it provides risk information to users of hazardous products. This information affects two types of decisions. First, it influences the discrete decision of whether to purchase the product or participate in the risky activity. Second, the hazard warning may also influence the precautions that the consumer exercises when using the product. For example, hazard warnings for many prescription drugs include information regarding potential adverse interactions with other products, such as alcohol.

The emerging emphasis on hazard warnings is not a unique development for the liability system. There has long been an interest on the part of government regulators in the role of hazard warnings. Even as far back as the 1960s, the US Congress mandated hazard warnings for cigarettes. It was, however, in the 1980s that regulatory efforts regarding warnings exhibited the greatest expansion. These policies came under the general heading of fostering the public’s ‘right to know’.

From an economic standpoint the issue is not so much the public’s right to know but rather the fact that it is more efficient in many cases for the public to know. Hazard warnings provide information to consumers so that they can make decisions that best reflect their own risk preferences. Hazard warnings can also provide needed information with respect to risk precautions to take advantage of the accident-reducing capability that individuals have. By some estimates, for example, most injuries in the US workplace are attributable to worker actions. Such estimates of course always involve an arbitrary element of classification. However, what is clear is that to fully exploit the opportunities for promoting safety in an efficient manner it is useful to take advantage of safety improvements in design as well as individual safety precautions.

In some contexts, such as that pertaining to workplace risks, it is often possible to monitor individual behaviour to promote safety. In contrast, for product risks most consumption activities are undertaken on a decentralized basis. It is not possible for the manufacturer to monitor how a product is being used or even if a product was being used at the time of the accident. The role of hazard warnings is consequently to promote the exercising of care by generating a decentralized understanding of the benefits of taking safety precautions.

Hazard warnings also serve to alleviate a major potential source of market failure. If people are fully cognizant of the risks and make sound decisions, then market processes with respect to hazardous products will generate efficient outcomes. By alerting consumers to the risk characteristics of products, hazard warnings can thus generate the kinds of market incentives that will promote the economically desirable levels of safety. From that standpoint, the basis for liability should be reduced since there will be less of an opportunity for market failure. In some cases, however, the effect of hazard warnings has not been to reduce a firm’s liability but rather to give firms another test that they can fail.

Matters are complicated further by the absence of sound legal guidelines for judging warnings. There is, however, a substantial literature on mechanisms for designing effective hazard warnings, which draws not only on the insights of economics but also on disciplines such as cognitive psychology. Such guidelines from the warnings literature could inform the courts as well.

The first principle for assessing hazard warnings is that courts should judge them from the standpoint of the entire hazard communication system. There is a tendency in court cases to focus on the particular hazard that led to the injury suffered by the plaintiff. If only there had been a bold warning pertaining to this specific risk, the plaintiff’s attorneys will argue, then the accident would not have occurred.

The difficulty with this line of reasoning is that products often pose multiple risks, not just one. Overwarning with respect to one particular hazard may be effective in preventing this particular injury, but potentially it can divert the individual’s attention from a wide variety of other risks posed by the product. The proper question to ask is whether the warning is adequate, given the multiplicity of risks posed by the product and the adoption of the same
kinds of standards for warnings as are being advocated for the risk that is the object of the litigation.

Very detailed warnings create problems of information overload. As a general rule, people can reliably process four to five pieces of information that they receive in a hazard warning. If they must confront information with respect to a wide range of risks, then the result may not be sounder decisions but consumer confusion.

A closely related problem to information overload is label clutter, i.e., the presentation of excessive information on the warning that distracts the user's attention from the essential risk message. Ideally, hazard warnings should convey the information to the consumer in a succinct manner without diverting attention to subsidiary concerns. Consequently, label clutter can be viewed as a phenomenon that often gives rise to problems of information overload.

Unfortunately, institutional incentives often promote excessive warnings. Companies fearful of being found liable in tort liability cases have an incentive to overwarn to protect themselves against the risk of an adverse liability judgment. The courts, and consequently companies, seldom ask whether the entire warning is as effective as it can be for the entire set of risks posed by the product. Rather, the concern of courts is typically with whether the specific hazard has been mentioned. This myopic approach creates incentives for unduly comprehensive warnings, which may include negligible risks that are not consequential but which potentially may be the object of litigation.

These same incentives for overwarning are also reflected in the character of the warning as well. Even when a warning for the particular hazard is included, the plaintiff's experts could argue that the warning is not sufficiently bold. If only the warning had been in larger print, had been surrounded by a box, or given some other kind of prominence, then the accident might have been prevented. The incentives created by the tort liability system will likewise lead firms to overuse these characteristics of warnings, thus diluting the vocabulary of hazard warnings.

The second principle for judging hazard warnings is that they should provide new information in a convincing manner. If the consumer is aware of the risk, there is no need to provide a warning to improve the workings of the market. Plaintiffs' representatives may suggest that warnings could nevertheless play a useful role as a reminder of the importance of taking a particular precaution. Unfortunately, warnings that simply serve as reminders have proven to be ineffective in altering individual decisions. A negative consequence of the profligate use of warnings and reminders is that they distract consumers' attention away from warnings for real risks that they may not yet understand. Because of individuals' limited cognitive capabilities, it is essential to utilize warnings in a parsimonious manner so that individuals can target their precautionary behaviour to take advantage of knowledge that they would not otherwise have in the absence of warnings.

Some court decisions have recognized the importance of not requiring warnings for all risks, including those that are well known. A particularly well-known case (Thorpe v. James B. Beam Distilling Co.) involved that of the risks posed by alcohol. Should a bourbon manufacturer be responsible for not warning pregnant women of the risk of drinking half a fifth of Jim Beam whiskey daily? In this case, would a warning on the bottle alerting the consumer to the risk of birth defects have deterred this behaviour? A Federal jury did not find the company negligent for failing to provide a warning in this instance.

Not all court decisions have upheld the warning in the case of risks that should be well known. For example, in Connelly v. General Motors Corp., a tyre manufacturer was found liable for not warning purchasers that a blowout could result if the vehicle was carrying an excessive amount of weight. Even a professional truck driver was able to win a lawsuit in Leonard v. Uniroyal, Inc. in which he claimed that the tyre manufacturer failed to provide him with information concerning the risk of underinflated tyres. Court decisions consequently do not fully reflect the underlying principle that should guide warnings, which is that hazards that should be reasonably well known do not merit hazard warnings.

The third principle for evaluating hazard warnings is that one should utilize scientific evidence to judge warnings to the extent possible. Unsubstantiated views by self-proclaimed human factors experts provide a less reliable guide for assessing warnings than evidence based on the scientific literature.

One source of evidence is market evidence. After the hazard warning, was there an effect on consumer perceptions, consumer precautions, or on product sales? Although information is not always available on all such components, often substantial data are available. Warnings for saccharine led to decreased consumption of saccharine-based beverages. The quantity of cigarettes smoked and the tar content of cigarettes have declined dramatically in the wake of hazard warnings. These market tests are often inconclusive but they do serve as an index of the extent of the effect of the hazard warnings on one component of behaviour — that relating to the purchase decision.

The second source of evidence that can be used to assess hazard warnings is based on experimental studies. By presenting consumers with a variety of products containing different warnings, it is possible to assess the efficacy of the warnings by comparing the differential influence of the different experimental treatments. Controlled experiments of this type can be undertaken on a limited basis rather than implemented through a nationally marketed consumer product. Based on a small sample experiment, it may be possible to ascertain how warnings affect risk perceptions, incentives for precautionary behaviour, and other magnitudes of interest.

The final source of evidence is to extrapolate, from other hazard warning studies, principles that might be applicable in a particular case. Although this approach of drawing insights from the literature is often useful, one must exercise care in doing so.

A fourth principle for judging hazard warnings is that the concerns should be with hazard communication more generally, not simply warnings. On-product warnings represent simply one mechanism for conveying warnings to consumers. They have the advantage that they accompany their product, but they have the disadvantage that they are
generally limited in size and, due to consumers’ cognitive limitations, are limited in terms of their total content.

There are a variety of other ways that companies can provide information with respect to hazard warnings. Safety videos, instruction manuals, and required training programmes are but a few other such mechanisms. For particularly complex risks, on-product warnings may not be the sole approach. One would not suggest, for example, that drivers’ education programmes and motor vehicle licensing requirements be abandoned and replaced by on-product warnings on automobiles providing guidance to their safe operation. The hazards are much too complex for this strategy to be effective. For many hazardous chemicals there are similar requirements.

Sometimes it is not efficient to require every consumer to become knowledgeable. Rather, it is more efficient to require other individuals to become educated so that they can process the information and convey it to the consumer for the risk decision. Prescription drug regulations in many countries exemplify this approach. Physicians serve as ‘learned intermediaries’. With their training in pharmacology and medicine more generally, they are better suited to processing the warning information and indicating its pertinence to the patient’s physical wellbeing than would be the patient himself.

A defence of regulatory compliance is not generally recognized for hazard warnings. In the case of cigarettes the US Congress has itself written the warnings language. This legislation included an exemption from liability with respect to hazard warnings in the post-warnings era. There are, however, no comparable defences for other warnings, even in cases such as warnings approved by the US Food and Drug Administration. These warnings are, in effect, written by the agency after receiving information regarding the product risk information provided by the company. Nevertheless, companies can and have been found liable for inadequate warnings that have been specifically approved by government agencies and have been written in a manner consistent with the vocabulary established by those agencies. Some observers have suggested that the defence of regulatory compliance would be desirable, if the warnings regulations involved conformed to a well-established vocabulary for such warnings.

5. MASS TOXIC TORTS. A predominantly American phenomenon that may pose increasing risks to other countries as well has been the emergence of mass toxic torts. Rather than having products liability lawsuits involving a single claim, there is often a large cluster of such claims facing the firm. This bunching of liability claims arises for two reasons. First, there may be some inherent riskiness of the product that leads to adverse outcomes for a large number of individuals. The asbestos litigation and the Agent Orange litigation typify this problem, as did the thalidomide litigation in Europe. The second potential source of difficulty is that for product defects that affect an entire product line, as in the case of design defects, masses of consumers will be exposed to the risk.

These problems become compounded in situations in which there is a deferred character to the risk. If a company markets a product for years or perhaps decades before becoming aware of the risk or the extent of liability, then there will be a large existing population of victims who can file liability suits against the company. The asbestos litigation, for example, involved claims from several decades of individuals who had been exposed to asbestos. Unlike acute accidents for which the firm receives immediate feedback regarding both the potential risks and the resulting liability, deferred hazards involving toxic exposures do not provide this kind of feedback, making it difficult for the company to adapt its corporate safety practices.

Tallies of various mass toxic tort cases indicate that the number of lawsuits can often be substantial. The morning sickness drug, Bendectin, led to 2,000 lawsuits, as did the drug DES. The Agent Orange litigation involved 125,000 claimants, and the Dalkon Shield litigation 210,000. The largest litigation by far has been for asbestos, for which there were 340,000 claimants.

Because of the mass nature of this litigation and the clustering of the claims, the risks are no longer independent and identically distributed, as may be the case for manufacturing defects. The result is that the usual assumption that various risks in the insurance portfolio will be offsetting will not be satisfied. Moreover, to the extent that this liability is imposed retroactively through changes in liability doctrine that are made after the initial risk exposure, it will not be feasible for firms to charge a price that reflects the product’s ultimate liability.

The difficulties posed by mass toxic torts created problems for even highly regarded insurance experts. The asbestos litigation was a major contributor to the financial problems of Lloyd’s of London, which underwent a reorganization in 1996. Lloyd’s greatly underestimated the extent of the asbestos litigation in 1982, when it estimated its worst case scenario for the total number of cases that would eventually develop as being 81,000. Lloyd’s subsequently raised this estimate to 180,000 cases in 1990, but this estimate still remained below the tally prepared by the American Bar Association. Quite simply, Lloyd’s guessed wrong. With mass toxic torts, errors are catastrophic. The problems posed by mass toxic torts are such that for insurers and reinsurers like Lloyd’s a miscalculation of the likely extent of such an unprecedented risk was devastating (see Viscusi 1996).

Mass toxic tort litigation poses difficulties for the courts as well. In the Agent Orange litigation, American soldiers who had been exposed to the potent herbicide Agent Orange claimed that these exposures had led to a wide variety of ailments, such as skin cancer and genetic damage. The initial litigation involved 600 different actions brought by over 15,000 named individuals, with the estimated total claimants being roughly ten times that number. In addition to dealing with the unwieldy character of the litigation, the courts also had to confront the dimly understood scientific issues. Ultimately, Judge Weinstein fashioned an out-of-court settlement to compensate the injured veterans $180 million - a small amount per claimant – because he believed the causality was not sufficiently well-established to warrant litigating the case (see Schuck 1986).

The asbestos litigation poses similar causality problems,
but for asbestos there is generally scientific consensus that exposure does pose a significant cancer risk. The difficulty is that the adverse effects of asbestos are not always signature diseases. Mesothelioma, which is cancer of the lining of the lung, is so strongly linked to asbestos exposures that it does qualify as a signature disease. However, asbestos causes conventional lung cancers as well. Such lung cancers could arise from other risk exposures, such as cigarette smoking. Indeed, there is a major synergistic effect between asbestos exposures and cigarettes, which greatly increases the individual risk of cancer. Assessing which cases of cancer were caused by asbestos and which were caused by other risk exposures is not feasible. Compensation of all cancer victims with asbestos exposures will lead to overcompensation of plaintiffs since many of those receiving compensation were not made ill by the asbestos exposure but rather by some other risk factor.

The asbestos litigation also epitomizes the practical problems of obtaining large levels of compensation from companies in a mass toxic tort case. When faced with the daunting price tag for these claims, the major asbestos producer reorganized into a company now known as the Manville Corporation. Companies involved in other kinds of mass toxic tort court litigation, such as A.H. Robins, have also reorganized under bankruptcy law.

These reorganizations are accompanied by the establishment of trust funds to pay the illness victims who emerge over time. It has, however, proven difficult to estimate reliably the ultimate costs that will be incurred by these trust funds. Part of the difficulty stems from the uncertain nature of the scientific evidence regarding the risk, but there are also problems in determining how many people who are not actually injured by the risk exposure but by some other cause will be able to file a successful claim.

There have been repeated shortfalls in the adequacy of the trust funds that have been established. The asbestos trust funds in particular have received a series of infusions of funds as they have repeatedly become insolvent. Similar difficulties may affect other trust funds.

Developing a sound strategy to resolve the problems posed by mass toxic torts ultimately requires that one consider possible solutions in terms of their effect on the principal roles of the torts system – compensation and deterrence. Mass toxic tort litigation has served neither objective well. Compensation of ill victims has often been haphazard. Victims of risk exposures such as Agent Orange have received negligible compensation because of the difficulty of resolving scientific uncertainties. For well-established risks such as asbestos, there is compensation not only for asbestos-related illnesses, but also for asbestos workers whose illnesses were not caused by asbestos. If the objective is simply to provide compensation to those who suffer illnesses, that objective could be addressed through a more comprehensive social insurance programme.

The deterrence function of mass toxic torts has also fallen short of what is ideal. Court-imposed penalties do not affect the corporation except after a substantial lag. Decision makers at the time the risk was generated may no longer even be affiliated with the corporation. Particularly in instances in which liability is imposed retroactively using legal doctrines that could not be anticipated at the time of the risk decision, there will be no deterrent effect. Any deterrence role will be prospective insofar as major liability suits affect expectations regarding potential liability costs. Legal uncertainties may encourage timidity and discourage innovations. Well-defined government regulations could provide guidelines for safety behaviour. Establishing predictable legal responsibilities that the firms could anticipate at the time of the risk decision would also help create an effective deterrent.

6. DAMAGES. As the role of products liability has increased, the total volume of damages has escalated as well. Million dollar verdicts receive substantial publicity, as do seemingly outlandish awards, such as the award of $1 million in compensation to a woman in Philadelphia who claimed that a CAT-scan caused her to lose her psychic powers.

Much of the alarm with respect to damages awards may, however, be overstated. The economic component of awards typically addresses the present value of the financial costs that resulted. In the case of a fatality, for example, this loss consists of the present value of the lost earnings less the decedent's consumption share and taxes. For non-fatal injuries, there is typically an additional financial loss component consisting of the present value of present and future medical expenses, rehabilitation costs, and related expenditures associated with the recovery from the accident.

These damages components of the award have increased for two reasons. First, inflation in general will boost the nominal cost of the awards, though not in real terms. When there is no inflation of cost levels in the analysis, the present value of damage awards is calculated using real rates of interest so that plaintiffs are not overcompensated or undercompensated in real terms. Similarly, recognition of inflation in costs can be offset by incorporating inflation in the discount rate. However, inflation does contribute to higher absolute levels of reported awards so that failure to account for general price changes will lead to an overstatement of growth in awards. Second, inflation in medical prices in particular will boost these costs even further. The medical price component of the consumer price index in the United States has outstripped inflation rates for the standard consumer market basket of goods. As a result, there has been an acceleration in the dollar value of economic payments for injury victims so that these awards can keep pace with inflation.

The more controversial component of the awards has been that pertaining to pain and suffering. The frequent criticism of such awards is that they are arbitrary and capricious, as juries have no sensible guidelines for setting pain and suffering damages. These uncertainties may lead to consequential financial costs since the share of the bodily injury awards devoted to pain and suffering compensation ranges from 26% for costly injuries such as paraplegia to a high value of 57% for burn cases.

Detailed statistical analysis of awards for pain and suffering suggests that the extreme criticisms of these awards are not justified. Pain and suffering compensation increases with the dollar value of the economic loss, though not proportionally. Pain and suffering compensation is
consequently not simply a constant markup of the economic loss component.

In addition, there is a strong statistical correlation of pain and suffering awards with the most severe types of accident. Controlling for the dollar value of the economic loss, pain and suffering awards tend to be much larger for truly severe health outcomes such as brain damage. Thus, there appears to be a systematic pattern by which juries do in fact target pain and suffering awards to be greatest in situations in which there are severe health effects.

Although these patterns of rationality are present and run counter to the most extreme criticisms of pain and suffering awards, there nevertheless appears to be a potential role for creating greater structure with respect to such damages. Doing so, however, requires that there be a consensus as to the objective that pain and suffering compensation seeks to accomplish. From the standpoint of optimal insurance, it is desirable to buy insurance to provide for one's self after an injury so that the level of income provides the same marginal utility as would income before the injury. In the case of a severe injury that greatly diminishes one's ability to derive wellbeing from additional expenditures, such as brain damage, the optimal insurance value of pain and suffering compensation will be quite low. It may, nevertheless, be desirable to have substantial compensation for medical expenses and rehabilitation costs since these efforts are likely to have much greater effects on one's welfare.

A second perspective that one might take for pain and suffering damages is that their objective is to make the injured party 'whole'. This is typically the economic maxim in the case of financial losses. For accidents involving purely financial consequences, the objectives of making the individual whole and providing efficient insurance coincide. However, in the case of health effects that diminish one's ability to enjoy spending money, the make-whole compensation level will exceed the optimal insurance amount.

A third perspective one could take for pain and suffering damages is to ascertain the appropriate deterrence value. Ideally, injurers should face a greater financial sanction when they inflict pain and suffering as well as a given monetary loss as compared to the situation in which they inflicted only that same monetary loss amount. Imposing a pain and suffering cost can serve to promote these deterrence incentives. One economic difficulty that arises, however, is that to the extent that this deterrence sanction must be paid to plaintiffs, it will create a problem of over-insurance. The increase in the product price that consumers will pay for this over-insurance would be more than they would be willing to pay had they been able to structure the financial arrangements by themselves. A second practical difficulty with deterrence values for pain and suffering is that they typically arise only in the context of punitive damages, thus limiting their applicability to extreme situations of reprehensible corporate behaviour.

A final concept that has arisen with respect to pain and suffering damages is that of 'hedonic damages'. The nature of this concept and the difficulties of applying it in the courtroom are discussed in VALUING LIFE AND RISKS TO LIFE.

7. LIABILITY REFORMS. The successive insurance crises have led to a series of liability reforms pertaining to products liability. Although many reforms were enacted in the 1970s, by far the largest wave of reforms took place in the 1980s after the dramatic escalation in premiums in 1985 and 1986.

From an economic standpoint, the criterion for judging reforms should be whether these reforms fostered a more efficient liability system. Do these reforms enhance the insurance and deterrence functions of liability, decrease the transactions costs associated with litigation, or generate other enhancements that provide overall societal benefits? The crisis atmosphere in which the reforms were enacted, however, made cost control the paramount concern. Although there has been some attempt to link the particular reform efforts with sound economic rationales for changes in the structure of liability, the primary emphasis has been on measures that would reduce costs and curb the rise in liability premiums.

There has yet to be any comprehensive liability reform at the level of the Federal government in the United States. However, a majority of the states enacted a wide variety of reforms in the late 1980s. These reforms focus both on liability criteria as well as the setting of damages and were undertaken both for products liability specifically as well as for liability more generally.

Among the more common reforms have been state-of-the-art defences, statute of limitations, collateral source rules, and various damages rules. A number of states have also enacted other reforms pertaining to joint and several liability, nuisance litigation, and even targeted measures, such as the State of Colorado legislation prohibiting lawsuits against ski areas.

The state-of-the-art defence provisions are quite varied. Some states provide state-of-the-art defences if the product is in compliance with government safety standards. Other reforms provide defences if the manufacturer complied with standard industry practice at the time it manufactured the product. The overall intent of these measures is generally to give companies a safe harbour so that if they meet generally accepted safety standards then their uncertainty regarding prospective liability will be reduced.

Statute of limitations reforms have also been quite widespread given the rise of cases involving deferred risks. What should be the time limit for being able to file a suit regarding a hazardous product? What should be the starting date for determining this limit? Is the firm liable for injuries involving its product for all time, or can liability be restricted to the normal useful life of the product? Should the cutoff be based on the date of the product's purchase, the date of the injury, or the date at which the consumer became aware of the product's existence? These various reforms specify both the time limit for possible litigation, such as a decade, and indicate the criteria for determining whether this constraint has been satisfied.

Collateral source rules have also been quite prevalent as a mechanism for addressing the escalating damages associated with products liability suits. Plaintiffs can often secure multiple recoveries for a given injury. Private insurance, workers' compensation, tort liability, and multiple
defendants could theoretically lead to problems of double-dipping. To prevent such overcompensation of accident victims, many states have imposed limits, such as restricting the plaintiff's recovery of medical expenses to a single source.

By far the most important type of liability reform has pertained to damages reforms. A large number of states have imposed restrictions on damages, such as dollar caps on pain and suffering awards. By imposing these limits, the reform efforts attempt to provide structure to pain and suffering compensation.

The empirical effect of the pain and suffering caps has been much greater than the combined influence of the other liability reform efforts. Damages caps of various kinds have had a dramatic effect in lowering insurance premiums and in improving insurer profitability. From the standpoint of cost control, these measures have certainly fulfilled the espoused objective of their advocates. A potential problem with caps on damages, however, is that they tend to fall disproportionately on the large-stake cases. The severely injured are most likely to be constrained by the caps so that their ratio of total compensation to economic damages will tend to be compressed more than those at the low end of the injury cost spectrum. For products liability cases, as with many other kinds of liability, it is the small-loss cases that tend to be more overcompensated and the larger-loss cases that tend to be more undercompensated. Two factors that give rise to this phenomenon are the high transactions costs associated with litigating small cases, which increases defendants' incentive to settle small cases, and risk aversion on the part of plaintiffs, which encourages them to settle large-loss claims.

Some analysts have suggested that court decisions themselves may have shifted to a more pro-defence orientation after the liability crisis. Whether this change simply marks a stabilization of the current liability structure or a return to an earlier more pro-defence era is unclear. The role of statutory reforms and liability reform efforts more generally in promoting changes in judicial opinion is also a possible factor.

Some reform proposals have urged much more sweeping changes in the US tort liability system. In particular, litigation of cases imposes substantial transactional costs and is often an inefficient way to transfer money to accident victims. In the asbestos litigation, for example, some estimates indicate that almost $3 in compensation is paid for every $1 received by plaintiffs because of the substantial legal fees involved. Social insurance and administrative compensation schemes are potentially a more effective mechanism for meeting the insurance needs of such accident victims, particularly when deterrence is not an important concern.

There have also been questions raised about the ability of juries to deal with complex litigation issues. Some common law countries such as England do not utilize the jury system for most torts, so that this is not a necessary feature of a common law liability structure. The areas for which juries have come under closest scrutiny are with respect to the treatment of complex scientific evidence pertaining to liability, and damages judgements for which there are no objective criteria, such as pain and suffering awards and punitive damages. Although there have been some proposals to change the litigation structure by, for example, utilizing science courts, for the most part the reform efforts have focused on more incremental proposals such as legislatively enacted damages caps.

8. The current status of products liability. Since the products liability crisis of the mid-1980s liability costs have stabilized, but at a higher level than before. Litigation has dampened - a change attributable largely to the asbestos cases working their way through the liability system. Firms may also have become increasingly willing to settle cases out of court rather than incur the risk of litigation. Liability reforms have also stagnated, as repeated proposals for Federal products liability reforms addressing issues such as punitive damages have fallen just short of enactment.

Missing from almost all policy discussions of liability reform is a sense of the multiplicity of social institutions that provide incentives and compensation for product injuries. Government regulations set standards and create incentives for deterrence for a wide variety of product health and safety risks. In cases in which the risks are deferred or in which scientific evidence is much disputed, government regulators seem better able to set appropriate standards of safety and provide incentives for deterrence. There has been as yet very little coordination between products liability and government regulation. For example, very few states provide for a regulatory compliance defense or any other kind of measure that specifically links the two kinds of social institutions.

There are also multiple institutions that provide compensation to those who are injured. Social insurance efforts, workers' compensation, private health insurance, and other mechanisms are all operative. Apart from collateral source rules, there has been little effort to address these multiple sources of compensation or to ensure that responsibility for compensation is done in a way that best promotes incentives for deterrence.

On balance, products liability is no longer in a state of crisis, but it is not entirely well either. There remains a continuing need to develop reforms that do not react simply to short run phenomena in insurance markets but instead address more fundamental issues of providing adequate deterrence to protect consumers and efficient levels of compensation to meet the income needs of those who suffer product injuries.

W. Kip Viscusi

See also CAUSATION AND TORT LIABILITY; CLASS ACTIONS; CRIMINAL SANCTIONS FOR PRODUC'T SAFETY; INSURANCE, DETERRENCE AND LIABILITY; JURIES; OCCUPATIONAL DISEASE AND THE TORT SYSTEM; THE CASE OF ASBESTOS; REGULATION OF TOXIC SUBSTANCES; REMOTE RISKS AND THE TORT SYSTEM; RISK REGULATION; SELECTION OF CASES FOR TRIAL; TOTAL OFFSET RULE IN DAMAGE AWARDS; VALUING LIFE AND RISKS TO LIFE.

Subject classification: 5d(ii); 5d(v); 6d(iii).

CASES
Connelly v. General Motors Corp., 540 NE2d 370 (III. 1989); verdict rendered 10/5/89.
professional corporations and limited liability.

Traditionally, groups of professionals that wished to enter business together were required to organize as general partnerships. In recent years, however, the legal forms available to such associations have flourished and today professionals may choose among several forms, including professional corporations, limited liability partnerships and limited liability companies, in addition to the conventional general partnership.

While these entities differ, they all share a common approach to vicarious liability for claims resulting from professional misconduct. The new entities seek to sever joint and several liability of partners for claims arising from the professional conduct of partners. In all cases, the statutes maintain unlimited liability for each professional relating to his or her own conduct and those under the partner's direct control and supervision for the activity that generated the liability claim.

Black's Law Dictionary (1990) gives the classic reference to professional corporations and partnerships. It defines professional corporations as corporations organized by sellers of personal services where the sale requires a licence or other legal authorization, and prior to such statutory authorization, the corporation cannot offer the service. Black's continues by offering examples of relevant professions that include public accountants, chiropractors, osteopaths, physicians, surgeons, dentists, architects, optometrists and lawyers. It describes tax benefits as an important reason to form the corporation and further states that the act of incorporating does not insulate the principal from malpractice liability.

In fact, many states have acted to sever the joint liability component within professional service entities, limiting the liability of principals. With limited liability, principals are restricted to liability for their own actions and the actions of their direct agents; they are not liable for the actions either of other principals or of partners or the agents of these other principals or partners. Limited liability thus becomes an option when practitioners are organized in teams of two or more, a reasonably common situation; for example, in 1980, 55.3 percent of all practising lawyers in the US were in firms of two or more lawyers (Curran and Carson 1994). When professionals are organized as sole practitioners, limited liability is irrelevant.

We first describe the liability status within professional service entities and review the somewhat unsettled recent US history of statutory reform on professional liability. We then discuss some of the economic implications for professional markets from limiting vicarious liability.

1. LIABILITY STATUS IN PROFESSIONAL CORPORATIONS, LIMITED LIABILITY PARTNERSHIPS AND LIMITED LIABILITY CORPORATIONS. In the traditional view the relationship between professional practitioners and their clients has been deemed to be closely personal, with the qualified practitioners directly accountable to the client. For professionals, liability was held to promote internal monitoring and enhance the standards of professional conduct. As professional service entities typically have limited assets while their professional owners/partners have significant wealth, exposing the professional owners/partners to unlimited vicarious liability would enhance the ability of plaintiffs to recover from the firm and increase the penalties for misconduct.

Unlimited liability, however, is costly for the practitioners as it requires them to monitor both the conduct and the wealth of their associates. These transactions costs increase with the size of the firm and the geographical spread of the locations of professional activity. From an efficiency perspective, the issue is whether the disciplinary benefits that flow from unlimited vicarious liability outweigh the organizational costs that may restrict efficient resource allocation.

Professional corporation. The menu of legal forms open to professionals depends on the state in which they operate (see Cavitch 1992). All states have legislation governing professional corporations. There are two variations in the law: the statutes either encompass all authorized professions within one act or have separate statutes for each profession. Similarities across the various professional corporation statutes include the following:

- the corporation may issue stock only to those licensed to practice in the relevant profession;
- the corporation may offer only one type of professional service;
- the officers, shareholders, agents or employees of the corporation are liable for any misconduct committed by themselves or those under their direct control and supervision.
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