

**An Introduction to the Legal and  
Economic Theories of Torts\***

by

**Winand Emons\*\***

revised November 1992

\* I thank Eric van Damme, Martin Hellwig, and Tony Horsley for helpful discussions, the Schweizerischer Nationalfonds for financial support, and the CentER for Economic Research at Tilburg University for its hospitality.

\*\* University of Bern

# **An Introduction to the Legal and Economic Theories of Torts**

by

**Winand Emons**

## **Abstract**

This paper begins with a survey of the classical legal theory of torts. Then we motivate and describe the economic approach to accident law. We demonstrate that negligence rules under which one party bears the entire accident costs induce an efficient pattern of behavior in a setup with identical individuals. Finally, we show that liability rules which share damages are superior to negligence rules once we leave the identical individuals framework.

*Keywords:* liability rules, mechanism design.

*Journal of Economic Literature* Classification Numbers: 026, 916.

Author's address:

Volkswirtschaftliches Institut  
Universität Bern  
Vereinsweg 23  
CH-3012 Bern  
Switzerland

## I. Motivation

People often harm each other by doing something wrong. Striking another person in anger (battery), running down a pedestrian carelessly (negligence), entering another's land without authorization (trespass), and libelling or slandering someone (defamation) are examples of such wrongful acts that harm someone else. All these instances have in common that the injurer and the victim were in no contractual relationship. Accordingly, if the victim sues for damages, he cannot look for contract law to resolve the dispute. Instead, the relevant body of the law to resolve these disputes is tort law as it is called in Anglo-American legal systems.<sup>1</sup>

The term tort is law-French, itself derived from the Latin word *torquere* which means to twist or to crook. A tort is any wrongful act, other than breach of contract, for which a civil lawsuit may be brought by a civil person. Tort law is older than criminal law. It predates the creation of the state. In most ancient and primitive societies, if A hits B and injures him, A has committed a wrong against B for which B is entitled to compensation from A. Indeed, Posner (1980) argues that antecedents of many of the modern torts can be found in ancient and primitive legal systems. The earliest cases that became recognized as sources of England's common law tort rules were those decided by the royal courts established by William the Conqueror's successors.

Nevertheless, before the coming of the railroad, tort law was a rather unimportant field. Few reported cases involved unintentional accidents, as distinct from intentional wrongs such as assault and battery which were rarely litigated. The rise in accident cases following the development of the railroad resulted in a considerable amplification and refinement of the tort principles governing accidents. By the middle of the nineteenth

---

<sup>1</sup> In France tort law is known as *la responsabilité civile délictuelle* (delictual liability); in Germany and Switzerland the counterpart to tort is *unerlaubte Handlung* (unpermitted action) and in the Netherlands the counterpart is *onrechtmatige daad* (wrongful act). For an application of economic analysis to German liability law, see Adams (1985).

century it was settled in both England and America that the normal standard of liability in accident cases was negligence. Only exceptionally was it strict liability. By the end of the nineteenth century tort law had assumed its modern shape.

This century has seen a rapid expansion of the domain of tort law. Many defenses to tort liability have been eliminated, notably the privity defense in products liability and the assumption of risk.<sup>2</sup> In many states of the U.S. contributory negligence has been replaced by comparative negligence.<sup>3</sup> The scope of harms for which plaintiffs have been allowed to bring actions and the size of judgements they have received have been growing very rapidly. In fact, the growth has been so fast and expansive that tort law is in turmoil in the U.S. For example, in 1985-86, 47% of all manufacturers in the U.S. removed product lines from the market, 25% discontinued product research, and 39% decided against introducing new products, all as a result of increased exposure to liability.<sup>4</sup> Criticisms of the negligence system as it operates in automobile cases have led in many states to the passage of no-fault automobile accident compensation laws.<sup>5</sup>

The perceived crisis in the tort liability system also gave rise to a secondary crisis in the liability insurance industry. To protect themselves against the awards of products liability cases, manufacturers currently pay \$3 billion per year in premiums for liability

---

<sup>2</sup> Under the privity defense a consumer cannot recover damages from the manufacturer of a defective product if he does not have a contract with the manufacturer but with the retailer. Under the assumption of risk the defendant can argue that the plaintiff willingly assumed the risk of injury.

<sup>3</sup> Roughly speaking, under contributory negligence either the injurer or the victim bears the entire damage whereas under comparative negligence the cost is shared between the two parties according to their relative fault.

<sup>4</sup> See Coleman (1989).

<sup>5</sup> The 1971 report "Motor Vehicle Crash Losses and their Compensation in the U.S." by the U.S. Department of Transportation among other things holds: 1) Only 45% of all those killed or seriously injured in auto accidents benefited in any way under the tort liability system. 2) Tort liability insurance would appear to cost in the neighborhood of \$1.07 in total system expenses to deliver \$1.00 in net benefits to victims. 3) Motor vehicle accident litigation in the court system was estimated to occupy 17% of the system's available resources.

insurance. In some cases, insurers have decided that the products liability area is so uncertain that they have withdrawn from the market entirely. It is routinely asserted today that a surgeon practicing in a major metropolitan area pays \$100,000 per year in medical malpractice insurance, if he gets insurance at all. Some municipal park districts stop summer programs for youth and dismantle public play structures due to the unavailability of liability insurance.<sup>6</sup> This catalogue, which could be lengthened at will, has led to the widespread belief that the tort system has broken down and needs to be extensively reformed.

The explosion of concern with the effects of torts on the economy strongly suggests an economic analysis of the rules governing accident law. In fact, the liability system was one of the first bodies of the common law to which formal economic models were applied. The classical legal theory provided insufficient guidance for courts that were increasingly involved with policy questions. Policy making courts need a behavioral theory to predict responses to changes in law and to evaluate these responses systematically according to a normative standard. Economics is able to provide both a behavioral theory and a normative standard. The behavioral theory treats laws, like prices, as incentives. The normative theory of efficiency is relatively uncontroversial as a broad guide to policy—who favors wasting money? But, controversy is abundant when efficiency is seen as dominating other norms of fairness and justice. Before we proceed with the economic analysis of accident law, we will briefly sketch the traditional legal theory, in particular the elements of a tort.

---

<sup>6</sup> See Cooter and Ulen (1988), p. 421.

## II. The Classical Legal Theory

The purpose of tort law is, roughly speaking, to protect the interests of people in their property and persons from damage by others.<sup>7</sup> Nevertheless, implementing this purpose is subtle. To understand liability law, it is necessary to go beyond the general account of its purpose and understand its elements. Three elements were distinguished in the classical theory:

- breach of duty owed to the plaintiff by the defendant,
- harm suffered by the plaintiff, and
- the breach being the immediate or proximate cause of the harm.

### a) Breach of Duty

A private wrong involves the breach of duty that one party owes to another. Thus, the first element of a tort is the breach of a legal duty owed to the plaintiff by the defendant. When such a breach occurs, it is said that the defendant was *at fault* or *negligent*.

The intent of the wrongdoer ( in legal parlance the *tortfeasor*) does not affect his duty to compensate the victim. The injury need not be intentional in order for the wrong to be a tort, the injurer to be liable, and the victim to recover damages.

Given that the defendant's breach of a duty constitutes the first element of a tort, the vital question arises: how are these duties determined? The most important rule we find in the law is that the potential tortfeasor is held to a duty of *reasonable* care. But exactly how much care is reasonable? To answer this question the law has developed the *reasonable man standard*. The reasonable man standard is an objective criterion that compares the defendant's precautionary activity with what a reasonable person would have done under the circumstances. This definition makes plain that the reasonable man standard for determining the defendant's duty is vague. For most actions, there is no statute that

---

<sup>7</sup> The following discussion draws heavily on Cooter and Ulen (1988) p. 326-334.

tells us how much care is reasonable. Instead, the legal standard usually depends upon norms, practices, and values of ordinary people.<sup>8</sup> Yet the reasonable man standard has the virtue of being extremely flexible. For instance, an ordinary level of care is required for manufacturing harmless products, whereas special care is required for handling dangerous objects such as explosives or pet bears.

## b) Damages

A second element in a tort suit is that breach of duty must give rise to measurable damages. Doing something dangerous that causes no harm does not constitute an actionable tort. Indeed, carelessness that causes no harm is called, neatly, *negligence in the air*. For example, mere outrage is not compensable. This fact sharply differentiates torts from morality. If somebody breaks a duty that, however, causes no harm, he may well be morally culpable. Yet he is not liable under tort rules.

In the past, the types of harm for which compensation was allowed was rather restricted. For example, in the nineteenth century, the legal maxim was that a person's action died with him. Thus, the victim's family had no right of action against a tortfeasor if the victim had died. This result struck most commentators as perverse, and so most states recognized, sometimes by statute, the tort of wrongful death, which allowed the victim's family, among others, to bring a civil action against the injurer for the harm they suffered because of the loss of their loved one. Accordingly, over the years the courts have steadily expanded the categories of compensable harm. For instance, modern courts compensate for intangible losses such as emotional harm, distress, and loss of companionship—harms that would have gone uncompensated not long ago. This expansion of the domain of com-

---

<sup>8</sup> The reasonable man has been described in numerous ways: 'average man', 'average juryman', 'ordinary man on the Clapham omnibus', 'never a woman', and 'the antropomorphic concept of justice'. In a social choice context, the reasonable man coincides with one of the individuals, both in terms of his preferences and in terms of his expectations. See Rubinstein (1983).

pensable harms may be considered as fair and just. Nevertheless, as we have seen in the Introduction, it also gave rise to awards that are so large that they threaten the health of entire industries.

### c) Causation

The third element of a tort connects the wrong and the harm; the former must cause the latter. Courts usually limit themselves to two types of causes. The first, and more comprehensive of these is the *cause-in-fact*. Establishing that the defendant's act was a cause-in-fact of the plaintiff's harm is a necessary but not a sufficient condition for the plaintiffs recovering. Lawyers often use the *but-for test* to decide whether an action was a cause-in-fact of a harm: but for the action, would the harm not have occurred. If the answer is yes, then the action is a cause-in-fact of the harm.

The second causal requirement for recovering damages is that the cause-in-fact is proximate, rather than remote. In other words, for the plaintiff to recover, the defendant's breach of duty to the plaintiff must be, not just a cause-in-fact of the plaintiff's injury, but also the proximate legal cause. As is the case of reasonable care, the law is fairly vague about what constitutes proximate cause.

The elements of a tort fit neatly into a coherent picture of social life and norms: a breach of duty proximately causes harm to the plaintiff. Most torts correspond to this picture. Nevertheless, the recent developments in tort law lack at least one of these elements. That is, courts have departed from the classical theory.

There has been a movement away from negligence to strict liability. Under the rule of strict liability the defendant is held liable for causing the harm, regardless of whether he breached a legal duty to the plaintiff. Anglo-Saxon tort law does in general not recognize a duty to rescue.<sup>9</sup> Nevertheless, Vermont and Minnesota have recently imposed by statute

---

<sup>9</sup> For example, A walks down a street and sees a flowerpot fall out of a window, threaten-



liability for failure to rescue, a tort which is difficult to explain in classical legal theory. In the last decade or so, juries have been increasingly willing to award punitive damages instead of the compensatory damages prescribed by the classical theory. Moreover, courts broke with the traditional requirement of proving cause-in-fact by allowing for liability without causality. A plaintiff can recover from negligent defendants even if the plaintiff cannot establish which of the defendants precisely caused the harm.<sup>10</sup>

To summarize: the classical legal theory of torts leaves the important terms of duty and proximity of cause fairly vague. Furthermore, it cannot cope with the full range of contemporary torts. Below, we will outline an economic approach to torts that provides a behavioral theory to predict responses to changes in law and a normative standard to evaluate these responses systematically.

### **III. An Economic Analysis of Torts**

#### a) Normative Economic Analysis

As we have seen in the Introduction, tort law is in a state of confusion in the U.S. The scope of harms for which plaintiffs have been allowed to bring actions and the size of judgements they have received have been growing so rapidly that even the liability insurance industry is in turmoil. The concern arose because tort liability became, loosely speaking, too ‘expensive’, or as an economist puts it: tort liability gives rise to an inefficient pattern of activity. This observation leads us to the economic goal that accident law should

---

ing B, and although A could have saved him simply by shouting a warning he keeps silent. Since tort law does not recognize a duty to rescue, B cannot collect damages from A. In contrast, in admiralty law there has always been a duty to rescue persons and property of ships in distress.

<sup>10</sup> For example, A and B, out hunting, carelessly mistake C for deer and shoot. C is blinded by one shot but there is no way to determine which of the two hunters it was. According to the traditional theory, C could not recover because he could not prove cause-in-fact. Yet a modern court decided that the hunters have to split the cost of compensating the victim because there is a 50% chance that each of them caused the injury.

achieve. The normative, or prescriptive, economic theory of torts strives for liability rules that give rise to efficient behavior. In other words, accident law should maximize the “size of the pie”.

This goal of the normative economic theory of tort law immediately raises the issue of equity, i.e., of how the pie should be sliced. The important question is whether there is a conflict between the pursuit of efficiency and the pursuit of equity. If the pie can be sliced in any way desired, then clearly there is no conflict—with a bigger pie everyone can get a bigger piece. If, however, in order to create a bigger pie, its division must be unequal, then, depending on what constitutes an equitable division, there may well be a conflict between efficiency and equity. It may be preferable to accept a smaller pie (less efficiency) in return for a fairer division (more equity).

Before we address the issue of efficiency versus equity, we have to check whether liability rules affect the distribution of incomes at all. The answer is yes. In tort disputes plaintiff and defendant are strangers. Consider the example where motorists inflict harm on bicyclists. Under a negligence rule bicyclists bear their own losses, whereas under the rule of strict liability motorists have to compensate bicyclists for their harm. Since there is no contractual or market relationship between the parties, there is no contract or market price that can be adjusted when legal rules change. Thus, shifting from one liability rule to another will redistribute income by the amount of expected losses.<sup>11</sup>

Given that tort rules have distributional effects, should they be used to promote distributional considerations? The answer to this question depends in part on the costs of using tort rules to redistribute income relative to the costs of using taxes and transfers. Legal redistribution may be costly in the sense that inefficient rules have to be chosen in

---

<sup>11</sup> Instead, the parties to a contract will take distributional effects of breach of contract remedies into account when setting the contract price. Thus, how the joint benefits of entering into the contract are shared between the parties not only depends on the remedies available to them but also on their relative bargaining strengths.

order to achieve the desired result. For example, in certain circumstances the negligence rule under which bicyclists bear their own losses implements efficient behavior whereas the rule of strict liability does not. But if motorists are wealthier than bicyclists, strict liability may be preferable to negligence on equity grounds. The loss of efficiency from using strict liability rather than negligence is a cost of redistributing income from drivers as a class to bicyclists as a class.

One important consideration in deciding whether to use tort rules to promote distributional equity is the precision of legal redistribution. Legal rules will not be able to redistribute income systematically unless the status of the parties to an accident corresponds closely to the groups between which redistribution is desired. For example, in the motorists/bicyclists setup, there need not be a close correspondence between an agent's income and an agent's vehicle choice. Perhaps higher income persons are more likely to be drivers than cyclists, but there are certainly many low-income motorists and high-income bicyclists. Thus, liability rules regarding driver/bicyclist accidents are not very precise instruments for accomplishing income redistribution.

Moreover, even when there is a close relationship between the status of the parties to an accident and the groups between which redistribution is desired, legal rules still might not be able to achieve redistribution as systematically as an income tax system. The reason is simply that redistribution through the tort system only occurs when there is an accident, and not all members of a given income class will be involved in accidents. In general then, the legal system is not as precise as the tax system in redistributing income by income classes.

All these arguments are typically given to tackle redistributional goals by the tax and transfer and not by the legal system. Even if equity is taken into account, there are good reasons why the efficiency analysis of tort law should be of principal importance. To concentrate on the efficiency goal, we will no longer consider the equity issue, below.

Accordingly, we implicitly assume that income can be costlessly redistributed by the income tax system.

In what follows, we want to make the economic concept of efficiency more precise. The normative economic goal most widely accepted in law and economics is the one proposed by Calabresi (1970).<sup>12</sup> He argues that, apart from the requirement for justice, the principal function of accident law is to reduce the sum of the costs of accidents and the costs of avoiding accidents. To this end he identifies three subgoals. 1) The number and severity of accidents should be reduced. This could be achieved either by forbidding activities which give rise to them or by making these activities less attractive and thereby inducing a substitution away from them to other activities. 2) The societal costs resulting from accidents after they occurred should be reduced. This subgoal corresponds to the opinion often found among legal writers that accident losses will be least burdensome if they are spread broadly. This can be achieved by risk-spreading or “deep pocket”, i.e., making those who can most afford it, pay. The principal difference between these methods is that deep pocket implies that partial spreading can reduce societal costs better than total spreading if the right people are made pay. 3) The costs of administering the treatment of accidents should be reduced because there is no point in achieving 1) and 2) if the costs of doing so exceed the benefits.

It must be recognized that the subgoals may conflict as, indeed, the third suggests. Furthermore, society may wish to deter accident-prone activities but not to the extent that it discourages them below the level at which they can be carried out safely. For example, motorists cause accidents but we would presumably not wish to ban driving completely since there are substantial benefits, and not every journey by every driver results in an

---

<sup>12</sup> We do not want to rehearse the debate about whether the common law should be concerned with efficiency at all. See, e.g., Posner (1981) who, in fact, argues that wealth-maximization is the only justifiable ethical norm. See, e.g., Stephen (1988 p. 194-201) and the references quoted therein for a critical discussion of this view.

accident. What has to be achieved is the best combination of the three types of cost reductions taking account of what must be given up to attain them.

Calabresi identifies two broad ways of doing this. First, by specific deterrence or the collective approach. Society collectively decides which activities are to be discouraged and discourages them by penalizing their occurrence, e.g., setting of speed limits, compulsory wearing of seat belts etc. Second, by general or market deterrence. This does not involve an a priori collective decision as to the correct number of accidents but involves discouraging them by imposing their cost on someone.

Calabresi argues that accident costs should be treated like any other costs which should be weighted by individuals when deciding how much activity to undertake. This is advantageous because it encourages individuals to engage in safer activities by providing an incentive to do so and it encourages agents to make a given activity safer. A pure market approach to primary accident avoidance would require the assignment of accident costs to those activities that could avoid accidents most cheaply. “This is the same as saying that the system would allocate the costs to those acts and activities that an arbitrary initial bearer of accident costs would (in the absence of transaction or information costs) find it worthwhile to ‘bribe’ in order to obtain that modification of behavior which would lessen accident costs most” (Calabresi (1970) p. 135). This is just another statement of the Coase theorem—in the absence of transaction costs it does not matter who initially bears the liability of accident costs, see Coase (1960).

Transactions are, however, prohibitively expensive in accident situations due to the large number of agents. Thus, accident costs cannot be internalized through Coasian bargaining. Nevertheless, another pattern of individual behavior might reduce accident costs and the aim of this approach is to determine what Calabresi calls the least-cost-avoider.

To summarize: tort law should be structured so as to maximize economic efficiency

where efficiency is measured as the aggregate benefits of activities minus their aggregate costs. In other words, accident law should not lead to a “waste of money”.

Let us conclude this section on normative economic analysis by discussing transaction costs some more. The notion of transaction costs can be applied to distinguish between contract law and tort law. The rules of contract law concern relationships between people for whom the ex ante costs of bargaining are low and who have, as a result, entered into a contractual relationship. The rules of tort law concern relationships between people for whom the ex ante costs of bargaining are high and who cannot, therefore, enter into a contractual relationship. Transaction costs help us to explain, e.g., why products liability moved away from contract law to tort law. The increasing use of standardized contracts made it impossible for each consumer to bargain individually with the manufacturer about the allocation of product risks. Accordingly, transaction costs became so high that, gradually, contract principles were substituted by tort principles in products liability cases. Transaction costs are, therefore, often a useful device to distinguish between contract law and tort law. Nevertheless, ambiguities remain. For example, employer-employee or doctor-patient relations seem ideally suited for regulation through the rules of contract and yet they are, by and large, regulated through labor law, tort law, and administered compensation schemes.

#### b) Positive Economic Analysis

Having established the efficiency goal of tort law, we want to start now with the positive economic analysis, i.e., the analysis of the behavioral consequences of liability rules. To begin with, let us discuss the relationship between the legal concept of causation and the economic concept of externalities. A negative (positive) externality is a cost (benefit) that the voluntary actions of one person impose (confer) on others without their consent. Since tort law is about costly accidents, we will focus on negative externalities,

below. Let us describe the notion of a negative externality by means of an example. Suppose a street is used by a motorist and a bicyclist. Both agents have the options to drive (to cycle) not at all, at moderate speed, and fast. Both agents prefer to go fast to going moderately to not driving (cycling) at all. If the motorist drives and the bicyclist cycles, an accident may occur. If one agent stays at home, there are no accidents. In case of an accident, the bicyclist incurs the entire damages that increase with the agents' speed levels. Moreover, suppose that the maximization of aggregate benefits minus the expected accident costs yields that both agents go at the moderate speed.

In a world without any legal rules, the bicyclist bears the entire accident costs. That is, if the motorist does not drive at all, the bicyclist incurs no damages whereas if the motorist starts driving, she inflicts damages on the cyclist that increase in the motorist's speed. This direct dependency of the bicyclist's well-being on the motorist's speed choice is a negative externality. By her speed choice the driver inflicts harm on the bicyclist without his consent.

If this were a property dispute, the bicyclist might ask for an injunction that would force the motorist to stop driving so that the bicyclist no longer incurs damages. However, this converts the situation to one in which the bicyclist's activity imposes a cost on the motorist—she can no longer use her car to, say, go to work. An externality still exists. An injunction simply chooses who has to bear the burden. This illustrates an important fact about externalities: they are reciprocal. There is no externality if the bicyclist does not cycle. So who causes the problem? No one really causes it. It simply arises from one of the many interdependences that exist in any society. This reciprocal nature of externalities shows that there is nothing like legal causation in the economic analysis of bilateral accidents. Both agents together determine the harm. The legal theory seeks to establish proximate causation to compensate the victim for the harm. The economic approach views bilateral accidents as externalities where both agents together determine

damages. Since both parties affect damages, both parties need private incentives to take appropriate private actions. It follows from this point of view that, e.g., unconditional full compensation of the victim erodes the victim's incentives to behave efficiently.

Now it is well known from economic analysis that to achieve an efficient outcome each agent has to take account of the full costs of his/her behavior so that he/she internalizes all of the adverse effects. In a world without any legal rules (or the rule of no liability), the bicyclist incurs the entire damage. When the motorist chooses her speed, she only takes account of her pleasure from driving and not of the costs she inflicts on the bicyclist. Consequently, she goes as fast as possible. The driver does not internalize the external harm and goes inefficiently fast. Thus, we need some mechanism that decentralizes the speed choices in an efficient way.

Tort liability may be seen as an incentive device whose goal is to induce an efficient pattern of individual behavior. A liability rule allocates the entire damages to the two parties to an accident according to the speed they have chosen. If the law prescribes a liability scheme, agents base their choices on the costs they incur under the rule. Accordingly, if we wish to decentralize efficient behavior, a liability rule should be designed such that each agent takes full account of the costs of his/her behavior so that he/she internalizes all of the adverse effects of the speed choice.

One simple way to guarantee full internalization is to let the bicyclist *and* the driver pay for the entire damages to some third party that in turn compensates the cyclist for his harm. Under this rule of double strict liability, the bicyclist incurs the entire damage as well as the motorist and both will, therefore, pick the efficient moderate speed.

Nevertheless, this rule of double strict liability gives both parties an incentive to form a coalition when an accident occurred. The motorist might try to bribe the cyclist by offering an amount that covers, say, half of the damage so that the bicyclist ends up paying for the other half. With such a deal, the bicyclist saves half of the payment he should give to



the third party. Accordingly, he has an incentive not to reveal the fact of an accident to the third party. Both parties will anticipate such an agreement. Accordingly, when they decide about their speed choices, they will take into account only half of the costs that they generate by their behavior.

Yet, if both agents consider only half of the adverse effects of their behavior, they will typically go faster than is efficient. The motorist considers only half of the costs she inflicts on the bicyclist and the bicyclist considers only half of the costs he inflicts on himself. Since the agents only pay for a share of the damage and get the other half free of charge, they consider driving resp. cycling cheaper than it actually is. Accordingly, they will pick speed levels that are inefficiently fast. This argument is typically used to demonstrate that a tort system that leads to the sharing of accident costs is inefficient.

A similar reasoning shows that under the rule of strict liability where the motorist bears the entire harm, the bicyclist cycles inefficiently fast because he gets his speeding activity free of charge.

To summarize: as a result of to the reciprocal nature of externalities, nobody causes harm in the legal sense. To achieve economic efficiency, each agent has to take account of the entire external costs he/she inflicts on the other agent to internalize all of the adverse effects of the speeding. Unfortunately, the trick to let each agent pay for the entire damage to achieve full internalization is not incentive compatible. Under no and strict liability as well as under sharing rules, at least one agent does not take full account of the adverse effects of his/her behavior. Accordingly, we must look for liability rules under which both agents internalize the full external costs and which do not give rise to ex post coalition forming.

### i) Efficient Liability Rules for Identical Individuals

It turns out that the negligence rule does the job for us. Under the negligence rule, the driver is not liable if she meets the due speed level; otherwise, she is strictly liable. Since we are concerned about economic efficiency, the due speed level is obviously the moderate one that maximizes aggregate benefits minus aggregate costs. The driver thus faces the following liability schedule. If she does not drive at all or at the moderate speed, she is not liable. Since both options are free of charge and the driver likes to speed, clearly she picks the moderate speed. If the driver goes fast, she is strictly liable, i.e., she has to pay for the entire harm. This drastic penalty induces the driver to pick the efficient moderate due speed level in order not to be liable. We have thus, in some sense artificially, imposed the ‘full costs’ on the driver. Since she internalizes the entire harm, she behaves efficiently.

Now consider the bicyclist. Given that the motorist picks the efficient due speed level and is not liable, the bicyclist bears, willy-nilly, the entire harm. That is, when choosing his speed, he internalizes the full costs of his behavior. Accordingly, he also picks the efficient moderate speed. Note that we have allocated the harm only once to the agents. They have, therefore, no incentive to form an ex post coalition. The negligence rule with the efficient moderate due speed level for the driver decentralizes the efficient allocation. Consequently, if the courts take the efficient moderate speed for drivers as the due speed level, the negligence rule implements the efficient pattern of individual behavior.

Analogously, the efficient outcome can be decentralized by the dual rule of strict liability with contributory negligence. Under this rule, the driver is strictly liable unless the cyclist is found liable. The cyclist is liable if his speed exceeds the efficient moderate due speed level. Accordingly, under this rule the bicyclist internalizes the accident costs via the penalty scheme and picks the due speed level in order not to be liable. Given the bicyclist's behavior, the motorist bears the entire accident costs and, therefore, chooses the

efficient moderate speed level.<sup>13</sup>

Negligence rules are thus an apt device to implement efficient behavior. Under the negligence rule or the dual rule of strict liability with contributory negligence, each agent takes into account all of the adverse effects of his/her behavior and picks the efficient speed.<sup>14</sup>

## ii) Efficient Liability Rules for Non-Identical Individuals

The nice efficiency properties of the negligence rule and the nasty ones of sharing rules in our basic model have led many authors to the following conclusion. The recent movement in the U.S. away from negligence rules to sharing rules in the form of comparative negligence is inefficient. In fact, Landes and Posner (1987 p. 314) call this trend an ‘anomaly’ that cannot be justified on efficiency grounds.

In what follows, we will show that this conclusion was premature. Notice that so far we have talked about one driver and one bicyclist. If we allow for more than two agents who, in particular, differ from each other, then sharing rules do a better job for us than the negligence rule does.<sup>15</sup>

Suppose we have many motorists who differ in the marginal benefits they obtain from driving and many bicyclists who differ in the marginal benefits they obtain from cycling.

---

<sup>13</sup> Notice that the negligence rule and the rule of strict liability are not only symmetric in the sense that the liability status is reversed but they also give rise to same pattern of behavior. The rules of strict and no liability are symmetric concerning the liability status but induce different behavior. See Brown (1973) for a more elaborate discussion of this point.

<sup>14</sup> Notice that this result only holds if the agents choose just one variable. If the agents were to choose a second variable, say, how much to drive, then negligence rules are no longer efficient in providing the correct incentives. Under the negligence rule, the driver picks the due speed level and is not liable regardless of how much she drives. Consequently, she does not internalize the effects of this second choice variable. See, e.g., Polinsky (1983) or Shavell (1980).

<sup>15</sup> Actually, the basic model’s results remain true if we allow for more than two agents but all drivers must be identical as well as all victims.

As an interpretation think of one driver as a teenager on her way to the grocery store to buy a gallon of ice cream and of another driver as a busy saleswoman who is late for her appointments. Given that drivers (bicyclists) obtain different benefits, efficiency requires that different individuals go at different speeds. For example, in an efficient allocation the teenager goes at moderate speed and the saleswoman drives fast; the assistant at the University of Basel pedals at moderate speed whereas the busy bicycle messenger should cycle fast.

Given that efficiency requires, not surprisingly, that different people do different things, the question arises: how do we decentralize the efficient allocation of speed levels in this extended framework?

The literature suggests (see, e.g., Posner (1986) p. 151-152) to implement the first-best optimum by the negligence rule using the incremental Learned Hand formulation. This rule, essentially, prescribes an individually tailored due speed level for each driver. That is, each driver faces her own, personal negligence rule with her own due speed level. The same reasoning as in the basic model shows that it is best for each driver to pick her own due speed level in order not to be liable. Given that motorists are not liable, cyclists again bear the entire accident costs and, therefore, pick the efficient speed levels. Consequently, the negligence rule using the incremental Learned Hand formulation decentralizes the efficient speed levels in our setup with non-identical individuals.

Nevertheless, the incremental Learned Hand rule raises two fundamental problems. First, to determine the efficient due speed level for each driver, a court must be able to ascertain each driver's benefits from driving, a task that is typically difficult to accomplish. If the courts cannot ascertain the drivers' preferences, *all* drivers will pick the highest due speed level and pretend to be the driver to whom this due speed level applies in case of a suit—an outcome that is inefficient. Once we drop the assumption that courts can discern individual benefits, we are bound to use liability rules that equally apply to all individuals

and do not give rise to cheating.

Even if courts are able to ascertain preferences, a second problem remains. The incremental Learned Hand rule defines a personalized due speed level for each driver and thus raises problems with respect to the equal protection clause. It might allow the saleswoman to drive up to 100 m.p.h. without being liable whereas the teenager is strictly liable if her speed exceeds 30 m.p.h. We might wish to treat a medical doctor on his urgent way to a patient differently from a tourist if both go very fast. Yet, are we willing to accept, e.g., income dependant speed limits that allow yuppies to drive faster than the unemployed? If we interpret the equal protection clause as meaning that the law should treat everybody who does the same thing in the same way, we are again restricted to use liability rules that apply equally to all individuals.<sup>16</sup>

If individually tailored liability systems cannot be used, as we will assume from now on, the literature suggests (see, e.g., Diamond (1974) or Shavell (1987, p.86-89)) the application of the negligence rule using the reasonable man/woman standard. Take some average, or reasonable driver and determine her socially optimal speed level. Define this reasonable speed as the due speed level of the negligence rule. If the due speed level is chosen high enough, all drivers pick the due speed level in order not to be liable. This causes an inefficiency because motorists below the average drive too fast whereas drivers above the average go too slowly compared to the social optimum. Yet, the reasonable man rule has the following virtue: since all drivers choose the due speed level and are not liable, bicyclists incur the entire accident costs and, therefore, pick speed levels that are efficient given the motorists inefficient choice.

To summarize, in our setup with non-identical individuals, the social optimum can be implemented by the negligence rule using the incremental Learned Hand formulation.

---

<sup>16</sup> Perhaps the major problem with individually tailored legal systems is not the constitutional one of equal protection so much as the tradition of what counts as a relevant difference when applying the principle that like cases should be treated alike.

If such a scheme that uses individually tailored due speed levels cannot be employed, the negligence rule using the reasonable man standard should be applied. Under this rule all drivers choose the same inefficient due speed level. Yet cyclists pick speed levels that are efficient given the motorists' inefficient choice.

It is, however, unclear whether the reasonable man rule induces efficient behavior. Let us scrutinize the efficiency properties of the reasonable man rule by tackling the following question: is it possible to design a liability rule that implements a more efficient allocation of speed levels than the reasonable man rule does? The answer is yes—a sharing rule does the job for us, see Emons (1990a). Recall that under the reasonable man rule, drivers below the average drive too fast compared to the social optimum. If we succeed in inducing these drivers to reduce their speed, apparently we increase welfare. We construct a liability rule where drivers are not liable for low speeds, where they pay some small fraction of the accident costs for moderate speeds up to the reasonable speed, and where they are strictly liable otherwise. This increasing liability scheme induces drivers with low marginal benefit to pick the highest speed level that is still free of charge (and less than the reasonable speed). Yet drivers with high marginal benefit prefer the reasonable speed and pay the small bill. This self-selection of the drivers increases welfare relative to the reasonable man rule outcome. However, since some drivers now pay their share of the accident costs, bicyclists no longer incur the entire damages. Thus, as we have shown in the discussion of sharing rules, they will increase their speed choices accordingly. Yet our sharing rule is constructed such that this increase is small and, consequently, has no first-order effect on welfare because under the reasonable man rule cyclists pick speed levels that are efficient given the motorists' inefficient choice.

Accordingly, we construct a sharing rule that induces drivers with low marginal benefit to reduce their speed below the reasonable speed while drivers with high marginal utility stick to the reasonable speed. The bicyclists' adjustments to the new rule have no effect

on welfare. Thus, our sharing rule implements an allocation of speed levels that is more efficient than the reasonable man rule outcome. Consequently, the negligence rule using the reasonable man standard is not efficient in providing the correct incentives if individuals are non-identical. The movement away from negligence rules to sharing rules can be justified on efficiency grounds simply by enriching the basic model with agents that differ from each other.

This result suggests the following question: is it possible to decentralize the *efficient* allocation of speed levels by liability rules? The answer is yes, if we allow for punitive damages, see Emons and Sobel (1991).<sup>17</sup> The reason why we employ punitive damages is suggested by the previous analysis. There, we alter the agents' behavior in some small, but welfare increasing way. Nevertheless, we have to take care of the agents' global incentive constraints. Specifically, we have to be very careful that the drivers who now have to pay for damages at the reasonable speed level do not abruptly switch to the maximum speed. This task turns out to be fairly difficult due to the no-punitive-damages constraint. If we allow for punitive damages, we can, e.g., penalize the agents heavily for doing such nasty things. Accordingly, ruling out the no-punitive-damages constraint makes it much easier to satisfy the agents' global incentive constraints.

We construct a liability rule where the ex ante expected payments increase in the agents' speed levels. The rule thus shares accident costs between drivers and bicyclists. Agents with low marginal benefit gain less from increasing their speed than agents with high marginal benefit. To avoid high expected payments, an agent with low marginal benefit goes more slowly than an agent with high marginal benefit. Accordingly, we can implement the first-best speed levels by means of increasing expected payments. The liability rule is designed such that the individuals sort themselves in the desired way.<sup>18</sup>

---

<sup>17</sup> See Emons (1990b) for a description of the results by means of a numerical example that is free of mechanism design terminology.

<sup>18</sup> Actually, it is possible to implement the first-best even if the actions are multi-

Under this liability scheme there may be situations where some agents are in expectation better off in the event of an accident than in the event of no accident. That is, some agents may ex ante expect a reward for getting into accidents. This may be seen as an annoying property of our rule. People may start driving not because it gives them direct pleasure, but only to collect rewards for being involved in accidents. A liability system should not allow this type of inefficient entry. Therefore, we show that if total expected damages are ‘large’, ex ante expected rewards need not be used by our liability rule.

These last results have the following implications. It is punitive damages that enable us to implement the social optimum. Accordingly, if we strive for efficiency, we should allow for punitive damages in tort cases.<sup>19</sup> Moreover, if total expected damages are ‘large’, we can implement the first-best allocation without relying on rules that raise the knotty problem of the conflict of efficiency versus equal protection.

Notice that our liability rules have the same informational requirements as the negligence and the reasonable man rule. Our rules require that a planner knows the distribution of preferences and the damage technology. The planner need not know which particular individual is of what type. To determine the efficient due speed level of the negligence rule (or the reasonable speed) a planner needs to know the harm function and the distribution of preferences in the economy, see Shavell (1987 p. 86-89). None of these rules requires the knowledge needed to implement the incremental Learned Hand rule. In this case, the judge must know the preferences of each agent, instead of the distribution of preferences in the economy.

---

dimensional so that the agents choose, e.g., how fast, how careful, and how much to drive. We use liability schemes derived from rules proposed by d’Aspremont and Gérard-Varet (1979) for a slightly different class of problems. If the agents’ actions are one-dimensional, we completely characterize the set of action levels that liability rules can implement with and without the restriction that nobody gets a reward for getting into accidents.

<sup>19</sup> Posner (1986, p. 176-177) provides “powerful reasons” not to allow for punitive damages in tort cases because they lead to inefficiencies. Our results show that his advice no longer applies if agents differ from each other.



## IV. Conclusions

In this paper we have shown that the classical legal theory cannot cope with the full range of contemporary torts. It provides insufficient guidance for courts that are increasingly involved with policy questions. We have demonstrated that the economic approach to torts provides a behavioral theory to predict responses to changes in the law and a normative standard to evaluate these changes systematically. The economic analysis of torts has thus turned out to be a useful tool in dealing with liability problems. Nevertheless, we have also shown that the strong policy recommendation not to apply sharing rules for efficiency reasons is based on the special assumption that all individuals are identical. If individuals are not identical, sharing rules do a better job than negligence rules because they induce the agents to sort themselves in an efficient way.

## References

1. M. ADAMS (1985), “Ökonomische Analyse der Gefährdungs- und Verschuldungshaftung”, R. v. Decker’s Verlag, Heidelberg.
2. C. d’ASPREMONT and L. A. GÉRARD-VARET (1979), Incentives and Incomplete Information, *Journal of Public Economics* **11**, 25-45.
3. J. P. BROWN (1973), Toward an Economic Theory of Liability, *Journal of Legal Studies* **2**, 323-349.
4. G. CALABRESI (1970), “The Costs of Accidents: A Legal and Economic Analysis”, Yale University Press (Student Edition), New Haven.
5. R. H. COASE (1960), The Problem of Social Cost, *Journal of Law and Economics* **3**, 1-44.
6. J. L. COLEMAN (1989), “A Market Approach to Products Liability Reform”, Report #88, Center for the Study of American Business at Washington University in St. Louis.
7. R. D. COOTER and T. S. ULEN (1988), “Law and Economics”, Scott, Foresman and Company, Glenview, Ill.
8. P. A. DIAMOND (1974), Single Activity Accidents, *Journal of Legal Studies* **3**, 107-164.
9. W. EMONS (1990a), Efficient Liability Rules for an Economy with Non-Identical Individuals, *Journal of Public Economics* **42**, 89-104.
10. W. EMONS (1990b), Some Recent Developments in the Economic Analysis of Liability Law: An Introduction, *Journal of Institutional and Theoretical Economics* **146**, 237-248.
11. W. EMONS and J. SOBEL (1991), On the Effectiveness of Liability Rules when Agents are not Identical, *Review of Economic Studies*, **58**, 375-389.

12. W. M. LANDES and R. A. POSNER (1987), “The Economic Structure of Tort Law”, Harvard University Press, Cambridge, Mass.
13. A. M. POLINSKY (1983), “An Introduction to Law and Economics”, Little, Brown, Boston.
14. R. A. POSNER (1980), A Theory of Primitive Society with Special Reference to Primitive Law, *Journal of Law and Economics* **23**, 1-54.
15. R. A. POSNER (1981), “The Economics of Justice”, Harvard University Press, Cambridge, Mass.
16. R. A. POSNER (1986), “Economic Analysis of Law”, 3rd ed., Little, Brown, Boston.
17. A. RUBINSTEIN, The Reasonable Man—A Social Choice Approach, *Theory and Decision* **15** (1983), 151-159.
18. S. SHAVELL (1980), Strict Liability versus Negligence, *Journal of Legal Studies* **9**, 1-25.
19. S. SHAVELL (1987), “Economic Analysis of Accident Law”, Harvard University Press, Cambridge, Mass.
20. F. H. STEPHEN (1988), “The Economics of the Law”, Wheatsheaf Books, Brighton.