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SOCIAL CHOICES AND COMPARATIVE NEGLIGENCE: RESURRECTING GALENA

David W. Barnes *  
Mark Baeverstad**

Advocating the recapitulation of ancient themes, Justice Cardozo stated: "[H]istory, in illuminating the past, illuminates the present, and in illuminating the present, illuminates the future." This statement appropriately introduces a reexamination of a century old rule of tort law originated by the Illinois Supreme Court in *Galena & Chicago Union Railroad v. Jacobs*. Basically, the *Galena* rule assigns liability on the basis of comparative negligence with no apportionment of damages between the parties. Such a rule of nonapportioned comparative negligence is Pareto superior to apportioned comparative negligence, traditional contributory negligence, and indeed, to any other modern or ancient tort rule, in that it provides a distinct and preferable mechanism for reaching social goals viewed as "economic" in nature.

In a recent reappraisal of contributory and comparative negligence, Professor Gary Schwartz rejected the economic implications of *Galena*. After examining the milieu in which affirmative tort defenses operate, he concluded that "economics furnishes no persuasive rationale for any contributory negligence defense rule; indeed, it suggests if anything the unwisdom of the rule in its traditional form." An examination of the efficiency implications of the various tort rules will, however, aid in assessing the societal costs of selecting a rule for traditionally noneconomic reasons.

The nature of economic goals and the identification of economic costs are analyzed in Section I of this Article. Section II applies this analysis to present tort rules using Learned Hand's formulation of negligence and evaluates alternative standards of liability designed to influence individual conduct. Section III, after examining the *Galena* rule in light of past and

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2. 20 Ill. 478 (1858).  
3. Vilfredo Pareto established criteria for positive economic analysis designed to test whether a proposed policy change is an improvement. See W.J. BAUMOL, ECONOMIC THEORY AND OPERATIONS ANALYSIS 400 (1972); V. PARETO, MANUEL D'ECONOMIE POLITIQUE 617-18 (1927). See also infra notes 9-12 and accompanying text.  
4. Schwartz, Contributory and Comparative Negligence: A Reappraisal, 87 YALE L.J. 697, 705-10 (1978) [hereinafter cited as Contributory and Comparative Negligence].  
5. Id. at 721.
present criticisms, concludes that this rule significantly out performs the present tort rules in achieving a variety of economic goals. Because economic analysis identifies the implications of choosing a rule, this analysis is applied to other goals—compensation, fairness, and safety—in Section IV.

I. THE NATURE OF ECONOMIC GOALS

Economic analysis of legal rules focuses on how alternative legal rules affect the costs of carrying out a variety of activities. Some analysts have focused on maximizing the value of economic resources. For example, according to Richard Posner, efficiency explicitly means maximizing this value. Maximizing the value of economic resources can be expressed equivalently as minimizing costs arising from the misallocation of resources. That is, efficiency is maximized by eliminating as often as possible those situations where resources are not devoted to their highest valued use. Focusing on economic costs allows economists to distinguish economic goals from other societal goals such as equitable distribution, fairness, and justice. Achieving these other goals, however, also creates costs to society which might be termed psychic costs. Although psychic costs may be more difficult to measure than economic costs, they are as real and, theoretically, might be subjected to the same minimization analysis. Economic analysis, however, traditionally has not focused on these costs.


7. Posner, supra note 6, at 10. Posner defines "value" as "human satisfaction as measured by aggregate consumer willingness to pay for goods and services." Id.

8. For discussions criticizing economic analysis or suggesting other goals in tort law, see Buchanan, Good Economics—Bad Law, 60 VA. L. REV. 483 (1974) (Posner's efficiency norm may compromise primary legal function of maintaining social order for the sake of economic efficiency per se); Epstein, A Theory of Strict Liability, 2 J. LEGAL STUD. 151 (1973) (suggests that in addition to economic theory, a system of tort law includes notions of fairness in fixing legal responsibility); Fletcher, Fairness and Utility in Tort Theory, 85 HARV. L. REV. 537 (1972) (suggests an approach for liability and compensation based on reciprocity of risks created between the parties); Leff, Economic Analysis of Law: Some Realism About
Professor Calabresi focuses on a portion of misallocation costs by explicitly adopting a goal of minimizing the costs of accidents. Minimizing accident costs is defined as minimizing the sum of the costs of having accidents and the costs of preventing accidents. A tort rule is Pareto superior to another rule if it minimizes accident costs in one situation without increasing accident costs in any other situation. A rule is Pareto optimal if it minimizes accident costs to the fullest extent. Applying this concept to tort law, the economic goal is to find a rule or set of rules that is Pareto optimal in reducing accident costs. Although Professor Schwartz asserts that no efficient rule exists and that no one negligence defense appears to be Pareto optimal, this Article contends that the Galena rule is Pareto superior to all other rules and, except in a few instances, is an efficient rule.

For the purposes of this Article, an accident will be viewed as imposing two types of costs on the parties to an accident. First, there exist the intangible or discounted costs incurred every time the risk of a particular accident is assumed. For example, every time a person drives his car, he subjects himself to the risk of an accident. Many of the costs of this risk are paid directly through automobile insurance premiums. Other costs of risk assumption, however, are not covered by insurance premiums. To demonstrate, medical insurance may not fully cover the risk of a meteorite hitting someone on the head, although one could insure against this risk by earmarking a portion of his funds every time he walks outside as a


10. Id. This approach of minimizing the sum of two alternative costs is used in a variety of areas of legal analysis. See, e.g., Becker, Crime and Punishment: An Economic Approach, 76 J. POL. ECON. 169 (1968) (author suggests that the social goal with respect to establishing criminal law penalties is one of minimizing sum of costs associated with violations of individual's property rights and with enforcement of those rights); Dowing & Watson, The Economics of Enforcing Air Pollution Controls, 1 J. ENVTL. ECON. & MGMT. 219 (1974) (polluting firm's goal with respect to adherence to environmental regulations presented as one of minimizing sum of costs associated with choices of compliance and noncompliance). In all examples of this approach, it is concluded that some mixture of accident prevention and accident occurrence, compliance and noncompliance, or enforcement and violation will usually minimize the costs associated with cost generating activities.

11. See supra note 3 and accompanying text.

12. Contributory and Comparative Negligence, supra note 4, at 710. Schwartz asserts, however, that a comparative negligence rule that apportions liability is the proper rule. His foundation for this assertion is a fairness criterion supported, in part, by psychological considerations. Id. at 727.

13. These are identical to what Professor Calabresi identified as the "primary" accident costs, see THE COSTS OF ACCIDENTS, supra note 6, at 26-27, and to those costs considered by Schwartz, see Contributory and Comparative Negligence, supra note 4, at 705-06. Other costs included in Calabresi's analysis are "secondary" costs, which measure the impact on society in absorbing the costs, and "tertiary" costs, the costs associated with administering the cost minimization rule. See THE COSTS OF ACCIDENTS, supra note 6, at 27-31.
premium against this risk. Mathematically, the aggregate of earmarked funds would cover any meteorite injuries that occur. Most of us do not maintain a separate meteorite injury risk fund, but nevertheless incur the same risk every time we step outside. The discounted risk assumption cost reflects the potential cost or risk of an injury resulting from an activity. Whether a particular individual ultimately will be injured is uncertain. Therefore, this cost is discounted by the probability that the accident will occur.

The second type of accident cost is the cost of taking measures to prevent accident risks. One accident risk prevention measure might entail wearing a pith helmet to protect the head from stray meteorites. The cost of this prevention measure would be the purchase price of the helmet plus the humiliation and inconvenience of wearing the helmet. The efficiency goal of the economic analysis, then, is to minimize the sum of accident risk assumption costs and accident risk prevention costs.

II. ECONOMIC ANALYSIS OF THE PRESENT TORT RULES

Negligence is defined by the Restatement (Second) of Torts as "conduct which falls below the standard established by law for the protection of others against unreasonable risk of harm."14 Traditionally, in an economic analysis of tort law, Learned Hand's description of negligent behavior as the creation of an unreasonable risk is adopted.15 Essentially, under Hand's


The degree of care demanded of a person by an occasion is the resultant of three factors: the likelihood that his conduct will injure others, taken with the seriousness of the injury if it happens, and balanced against the interest which he must sacrifice to avoid the risk. All these are practically not susceptible of any quantitative estimate, and the second two are generally not so, even theoretically. For this reason a solution always involves some preference, or choice between incommensurables, and it is consigned to a jury because their decision is thought most likely to accord with commonly accepted standards, real or fancied. Id. at 612. In United States v. Carroll Towing, 159 F.2d 169 (2d Cir. 1947), Hand gave this intuitive notion of unreasonableness in behavior its algebraic interpretation.

[T]he owner's duty [with respect to those endangered by risk of the owner's barge breaking away from its moorings], as in other similar situations, to provide against resulting injuries is a function of three variables: (1) the probability that she will break away; (2) the gravity of the resulting injury, if she does; (3) the burden of adequate precautions. Possibly it serves to bring this notion into relief to state it in algebraic terms: if the probability be called P; the injury L; and the burden B; liability depends on whether B is less than L multiplied by P: i.e., whether B < PL.

Id. at 173. For an early example of reliance on the theory later used in the Hand formula, see Blyth v. Birmingham Waterworks Co., 156 Eng. Rep. 1047, 1049 (Ex. 1856) (water company not negligent in burying pipes too near surface since probability of their bursting was minimal while cost of burying them deeper was substantial). See also Terry, Negligence, 29 HARV. L. REV. 40, 42-44 (1915) (one need not take precautions against every foreseeable danger but only against probable dangers).
analysis, negligence can be defined as conduct that creates a discounted accident risk assumption cost exceeding the accident risk prevention cost. Algebraically expressed, if the probability of an accident occurring is labeled \( P \) and the magnitude of the loss arising from an accident is labeled \( L \), then the discounted accident risk assumption cost is \( P \times L \). If the accident risk prevention cost is labeled \( B \), then by Learned Hand's formulation, the conduct of any person is negligent if \( P \times L > B \). Intuitively, negligent behavior is conduct creating risks which have an expected or discounted risk assumption cost greater than a prevention cost. This formulation is designed to identify inappropriate conduct in a society concerned with minimizing accident costs.

By placing liability on a party who engages in such "inappropriate" social behavior, the rule encourages actors to avoid liability by preventing accident risks. If this deterrent is effective, the prospect of liability will encourage the actor to prevent the accident risk whenever it costs less than risk assumption. A society of actors each individually minimizing costs in this way minimizes accident costs in the aggregate. Ultimately, minimizing accident costs frees resources which can be expended in other ways.

In the simple two-party accident, two accident risk prevention costs must be measured: the victim's cost of prevention, labeled \( B_v \), and the injurer's cost of prevention, labeled \( B_i \). Assuming that the accident risk assumption cost is the same to both parties, an and that the costs of prevention are not equal to each other or to the accident risk assumption costs, a maximum of six possible relationships exist between \( P \times L, B_v, \) and \( B_i \):

16. If each party has a different risk assumption cost, rather than equal risk assumption cost, the \( (P \times L)_v, (P \times L)_i, B_i, \) and \( B_v \) can be compared in six similar relationships that produce the same results as when \( P \times L \) is the same for both parties. Hand's rule of negligence would be expressed as follows: An actor, \( a, \) is negligent if \( 1 > B_a/(P \times L)_a \). For the two parties, victim \((v)\) and injurer \((i)\), the six situations where \( P \times L \) is not the same for both parties can be expressed as:

17. If two or all three of the costs are equal, a maximum of seven relationships may exist between \( P \times L, B_v, \) and \( B_i \). The possible combinations include:

16. See infra notes 54-57 and accompanying text. The case where multiple parties are involved in an accident and each has a different cost of risk prevention can be represented by assigning a prevention cost to each party. As the number of parties increases, the permutations of relationships increase beyond the six described in the text. Cost minimization is still served by encouraging the conduct represented by the right-most variable.
In each of these six situations, the choice represented by the variable in the right-most position is the most efficient choice of conduct because it represents the lowest cost to society. Conversely, the variable in the left-most position is the most inefficient choice of conduct because it represents the highest cost to society given our efficiency goal. The right-most variable represents an allocation of accident related resources Pareto superior to either of the other choices. The left-most variable represents a Pareto inferior choice relative to the other options. The allocation that results from choosing the option represented by the center position is Pareto inferior to the right-most choice and Pareto superior to the left-most choice. An accident cost minimizing rule would encourage future victims and injurers to engage in the conduct symbolized by the right-most variable. Examples from well-known tort cases illustrate the efficiency of various tort rules in each of these six situations.

**Situations 1 and 2**

In situations 1 and 2, $P \times L$ is less than either $B_v$ or $B_i$; thus risk assumption represents cost-minimizing conduct. An efficient tort rule in these situations would discourage both parties from preventing the accident risk because both of their individual prevention costs are greater than the cost of risk assumption.

An example of either situation 1 or 2 can be drawn from *Palsgraf v.*
Long Island Railroad,\textsuperscript{19} in which Judge Cardozo held that the railroad conductor had no duty to Mrs. Palsgraf to prevent the freak explosion which caused scales on the train station platform to fall on her. In economic terms, the cost to the railroad of foreseeing and preventing the accident, $B_i$, was greater than the probability of the accident occurring multiplied by the magnitude of the injury, $P \times L$.

Suppose the trial court had determined that Mrs. Palsgraf could have prevented the accident by wearing sneakers and taking a class in dodging scales, and that these measures would have cost one dollar per day, $B_y = \$1$. Suppose further that the trial court had determined that the railroad could have prevented the accident by refusing to assist passengers boarding a moving train and that the only cost to the railroad associated with this measure would have been two dollars per day in lost revenues from dissatisfied customers, $B_i = \$2$. Finally, suppose the accident risk assumption cost was fifty cents, $P \times L = \$.50$.\textsuperscript{20}

These findings of fact create an example of situation 1: $B_i > B_y > P \times L$. In Palsgraf, the court held that the railroad had no duty to prevent the accident risk.\textsuperscript{21} When the risk materialized, the railroad was absolved from liability and Mrs. Paslgraf was not compensated for her injury. Even though an accident actually occurred, under these factual assumptions, the court reached an efficient result because the accident risk was assumed rather than prevented and the risk assumption cost was the lowest cost. Potential victims in Mrs. Palsgraf’s position would not purchase sneakers or register for classes in dodging scales because the risk assumption cost of a similar accident is fifty cents while the prevention methods cost one dollar. Because assuming the accident risk is a lower cost choice, potential victims will continue to choose this alternative. Having escaped liability, the railroad has no incentive to prevent similar accidents in the future and also will assume the accident risk.\textsuperscript{22}

Suppose that the trial court had found that the price of sneakers was much greater and that Mrs. Palsgraf’s prevention cost was three dollars rather than one dollar. This finding of fact would create an example of situation 2: $B_y (\$3) > B_i (\$2) > P \times L (\$.50)$. Because $P \times L$ is less than $B_i$, the railroad would still not be considered negligent. As in situation 1, Mrs. Palsgraf would continue to assume the risk of losing fifty cents and this is the most efficient alternative.

From a cost minimizing perspective, whether Mrs. Palsgraf or the

\textsuperscript{19} 248 N.Y. 339, 162 N.E. 99 (1928).
\textsuperscript{20} This accident risk assumption cost is not unrealistic. An accident of this sort does not occur to one person out of every million. But even assuming that the probability was one out of a million, if Mrs. Palsgraf’s injuries amounted to $500,000, the risk would amount to only $.50.
\textsuperscript{21} 248 N.Y. at 341, 162 N.E. at 99.
\textsuperscript{22} This assumes, of course, that people and railroad corporations are neutral with respect to risk, that is, they do not choose to avoid risk for its own sake.
railroad pays for her injuries is immaterial because an efficient result always occurs. Had the court found the railroad liable in either situation 1 or 2, the railroad, rather than Mrs. Palsgraf, would have assumed the fifty cent risk, and thus, Mrs. Paslgraf would have been reimbursed for her injuries. Faced with a risk prevention cost in excess of the risk assumption cost, she too would take no steps to prevent the risk of another accident. In short, placement of liability upon either party in situations 1 or 2 would be efficient.23

Situations 3 and 4

In situations 3 and 4, efficient conduct prevails when the defendant-injurer prevents the accident risk. An efficient rule would thus encourage the defendant to incur this prevention cost. A rule of pure negligence with no defenses is an example of an efficient rule in these two situations.

*Vaughn v. Menlove*24 illustrates a situation in which only the negligence of the defendant-injurer was considered. In *Vaughn*, the defendant built a hay rick on his property dangerously close to the plaintiff's buildings. The plaintiff, worried that the rick might ignite, asked the defendant to remove it. This removal would have caused the defendant to incur costs, $B_r$. The defendant replied that he would "chance it."25 In other words, he chose to assume the cost of the risk, $P \times L$. Presumably the plaintiff could not have removed the rick himself without being liable for trespass—a high $B_v$.

The plaintiff brought suit after the rick spontaneously ignited and burned his cottages. Responding to the trial judge's instruction to determine whether the defendant had failed "to proceed with such reasonable caution as a prudent man would have exercised under such circumstances," the jury found the defendant liable.26 This finding is consistent with an intuitive conclusion by the jury that the facts were identical to those in situation 3: $B_v > P \times L > B_r$.

If the jury in *Vaughn v. Menlove* had determined that the plaintiff had a duty to remove the rick without regard to his potential liability for trespass,

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23. This type of analysis seems to suggest that individuals and corporations are lightning calculators of pleasure and pain, with full information about costs and alternatives at their fingertips. This suggestion is discussed and specifically applied to legal principals in *Posner*, supra note 5, at 20-22; Malclulp, *Marginal Analysis and Empirical Research*, 36 AMER. ECON. REV. 519, 521-22 (1946); and Williamson, *Managerial Discretion and Business Behavior*, 53 AMER. ECON. REV. 1032 (1963). The thrust of these articles is that it is not crucial to an economic analysis that all actors actually make appropriate calculations of the type discussed here on the basis of full knowledge. Economic theory suggests that there is a general tendency to act in the manner described on the basis of available information, or alternatively, that actors behave as if they were performing the calculations imputed to them. Learned Hand recognized this intuitive ability of people to balance "immeasurables" in *Conway v. O'Brien*, 111 F.2d 611, 612 (2d Cir. 1940), rev'd on other grounds, 312 U.S. 492 (1941).


25. *Id.* at 491.

26. *Id.* at 492.
the finding would be in accord with factual circumstances consistent with situation 4, $P \times L > B_v > B_p$. Under a pure negligence rule with no affirmative defenses, the plaintiff would still prevail and an efficient result would be obtained because the defendant's risk prevention cost remains the cost-minimizing alternative and potential injurers are appropriately encouraged to prevent the accident risk. Conversely, a contributory negligence rule barring recovery on a showing of any degree of causally related negligent behavior by the victim in situation 4 would lead to inefficient future behavior because someone other than the least cost preventer would be encouraged to engage in preventive activity.

**Situations 5 and 6**

In situations 5 and 6, prevention of the accident risk by the plaintiff represents efficient conduct. The rule of negligence with an affirmative defense of contributory negligence is efficient in these two situations because it encourages the plaintiff to engage in accident risk prevention.

Situation 6, $P \times L > B_i > B_v$, is illustrated by the case often cited as the origin of the contributory negligence defense, *Butterfield v. Forrester.* In *Butterfield*, the plaintiff was thrown from his horse when he collided with a pole that the defendant had placed across a portion of the road while repairing his house. At the time of *Butterfield*, an individual could be held liable for obstructing a public highway. The defendant, however, proved that if the plaintiff had used ordinary care rather than riding his horse as fast as possible at dusk, he would have seen the pole. The court, therefore, concluded that despite the defendant's negligence, the plaintiff also was at fault. Placing liability on the plaintiff is efficient in this situation because his cost of prevention, riding more slowly, is less than the risk assumption cost and less than the defendant's cost of prevention.

If the jury had applied the same reasonably prudent person standard to judge the defendant's action but found that the defendant had not been negligent in obstructing the road, then an example of situation 5, $B_i > P \times L > B_v$, would exist. This finding also would be efficient because it would place liability on the plaintiff thereby encouraging individuals in the plaintiff's position to prevent similar accidents.

**A Guide to the Efficiency of Existing Tort Rules**

The preceding discussion illustrates the relative efficiency of present tort rules in various situations. In situations 1 and 2, placement of liability on either the victim or the injurer was found to be efficient because the accident

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28. Id. at 927. "If a man lay logs of wood across a highway; though a person may with care ride safely by, yet if by means thereof my horse stumble and fling me, I may bring an action." Id.
29. Id.
risk will be assumed no matter which party ultimately pays the accident cost. In situations 3 and 4, the rule of pure negligence with no affirmative defenses is efficient because the injurer is held responsible for minimizing accident costs, thus providing an incentive to prevent the accident risk. Finally, in situations 5 and 6, the rule of negligence with a defense of contributory negligence is efficient because the victim is held responsible for minimizing accident costs, thus providing incentive to prevent the accident risk.

The table on the following page illustrates the situations in which each of the present tort rules is efficient or inefficient in reaching the goal of minimizing accident costs. In each case, the rule of liability is applied to the factual situation and the resulting incentive is examined to determine whether it encourages cost minimizing behavior.

Generally, an inefficient result is obtained when the party encouraged to take accident preventive measures faces the higher prevention cost. Comparative negligence with apportionment of liability is potentially inefficient in situations where both parties are encouraged to prevent the accident or where both parties are inappropriately encouraged to assume the risk of the accident.

Before generalizing about the factual circumstances that give rise to inefficient behavior under comparative negligence, consider a number of examples. Assume in each example that the jury apportions liability by comparing each party’s prevention cost to his risk assumption cost, that is, for each party the jury compares \( B \) to \( P \times L \). Because comparative negligence applies only when both parties were negligent, the jury does not apportion liability unless both parties’ risk prevention costs, \( B_i \) and \( B_v \), were less than the risk assumption costs, \( P \times L \). One intuitive method of comparing \( B \) and \( P \times L \) is to determine how much larger is \( P \times L \) than \( B \). In cases where the risk assumption cost is greater than the risk prevention cost, an algebraic representation of this intuitive comparison, the negligence ratio, \( B/(P \times L) \), will be very small. Essentially, this small fraction indicates that the risk assumption cost is much greater than the risk prevention cost. As the ratio approaches zero, the cost of preventing the risk becomes relatively small. This is equivalent to a high degree of negligence. The intuition underlying the representation is made clear by considering when the fraction approaches the value one. As the negligence ratio, \( B/(P \times L) \), hovers around one, the values \( B \) and \( P \times L \) are very close to each other, and the factfinder may be less certain that the party under consideration was negligent. Consequently, as the fraction varies between zero and one, the factfinder intuitively will associate a greater or lesser degree of negligence, respectively, with the party whose conduct is being considered.

For example, if a situation 4 case arises, the jury might find a risk assumption cost, \( P \times L \), of $600, victim’s prevention cost, \( B_v \), of $400, and injurer’s prevention cost, \( B_i \), of $200. The negligence ratio approach suggests that the victim was less negligent than the injurer because \( B_v/(P \times L) = 400/600 \) or \( 2/3 \), which is closer to one than is
## TABLE I
Comparative Efficiency of Tort Rules

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**Abbreviations:**

- **E** = Efficient in minimizing primary accident costs.
- **I** = Inefficient in minimizing primary accident costs.
- **I*** = Sometimes inefficient.
- **= Victim.**
- **i** = Alleged injurer.
- **B** = Risk prevention cost.
- **$P \times L$** = Risk assumption cost.

1. i is liable if $P \times L > B_i$.
2. i is liable if $P \times L > B_i$ and $P \times L < B_v$.
3. i is always liable.
4. i is liable unless $P \times L > B_v$.
5. like pure negligence except apportion liability if $P \times L > B_i$ and $B_v$.
6. i liable only when $B_i > P \times L$ and $B_v$. 
Each party's relative degree of negligence conveniently can be expressed as a percentage that increases to 100% as the disparity between the victim's and the injurer's negligent causal contribution to the accident increases. For each party, this percentage can be calculated by dividing the other party's prevention cost by the sum of both parties' prevention costs. In the present example, the injurer's relative degree of negligence is $B/(B_v + B) = 400/600$ or 67%. In terms of relative degrees of negligence, the victim's negligence, 200/600 or 33%, was only half as great as the injurer's. Thus, under the rule of strict apportionment of liability, the injurer's share would be twice as great as the victim's share. Accordingly, 67%, or $400, of liability would be apportioned to the injurer and 33%, or $200, to the victim.

Similarly situated parties, facing potential liability, presumably will compare their cost of prevention to their potential share of liability. Those in the injurer's position will reasonably choose to prevent the risk for $200 rather than to bear an anticipated $400 liability from risk assumption. Those in the victim's position will reasonably choose an anticipated $200 liability rather than a $400 prevention cost. The outcome is cost minimizing, and hence, efficient because the injurer alone bears the risk prevention cost, the lowest cost variable in situation 4. If the risk prevention costs of the victim and the injurer in this example were switched, the scenario would be that arising in situation 6.

An intuitive sense, sharpened by an understanding of the algebraic relationships, would recognize a potential for inefficient results whenever the risk prevention costs for both parties are high, but less than $P \times L$. It is reasonable to expect the parties to take greater preventive measures when prevention costs are low, and fewer when prevention costs are high. Numerical examples verify this conclusion.

Consider situation 4 where the risk prevention costs are relatively high, $P \times L \ ($600) > B ($500) > B ($450). As in the previous example, liability will be apportioned under any of the comparative negligence rules. The injurer is 53% at fault and bears a liability of $316 while the victim is 47% at fault and bears a liability of $284. People engaging in the injurer's activity in the future will not take measures to prevent the accident, however, because expected liability, $316, is less than the prevention cost, $450. Nor will people engaging in the victim's activity take measures to prevent the accident because expected liability of $284 is less than a $500 prevention cost.

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30. An equivalent, more complicated, but perhaps intuitively more appealing computation is as follows: Defendant's negligence ratio is $450/600$ or 3/4 while plaintiff's is $500/600$ or 5/6. Dividing plaintiff's ratio by defendant's ratio gives defendant's apportionment share, i.e., 5/6 [divided by] 3/4 = 1.11. For every dollar of liability plaintiff bears, defendant pays $1.11. For the $600 total liability, plaintiff's share is (Total Liability)/(Total Dollar Share) = $600/($1 + $1.11) = $600/2.11 = $284. Defendant's share is $600 - $284 = $316. This is equivalent to computing defendant's relative degree of negligence as $B_v/(B_v + B) = 500/(500 + 450) = 500/950 = .526%. Thus, defendant's liability is .526 \times $600 or $316 and plaintiff's liability is $600-$316 = $284.
Because neither party will take preventive measures in this example, the risk will be assumed for $600, the more costly and inefficient option. The preferred result is for the injurer to avoid the accident at a cost of $450. Switching the values for $B_i$ and $B_v$ in situation 6 gives a comparably inefficient result.

On the other hand, when prevention costs are relatively small, duplication of prevention measures may occur. If situation 4 arises where $P \times L ($600) > B_v ($50) > B_i ($30), liability would be apportioned at a cost of $375 to the injurer and $225 to the victim. Both the victim and the injurer will choose to prevent the risk and $80 will be expended on prevention even though the injurer alone can prevent the risk for $30. Again, switching the values of $B_i$ and $B_v$ in situation 6 gives a comparably inefficient result.

Generally, inefficiency will result in situations 4 and 6 whenever the relative degree of negligence of the least cost preventer of accident risk is greater than the ratio of his prevention cost to the total risk cost, or whenever the relative degree of negligence of the party that is not the least cost preventer of the accidents is less than the ratio of his prevention cost to the total risk.

The first inefficiency arises because both parties assume the accident risk when the least cost preventer should have taken measures to prevent the accident. The second arises because risk prevention measures are wastefully duplicated. Both are caused by the parties identifying their accident costs with their respective shares of liability resulting from apportionment.

31. The computation is as follows: Defendant's negligence ratio is $30/$600 or 1/20 while plaintiff's is $50/$600 = 1/12. Defendant's apportionment share is 1/12 [divided by] 1/20 or 1.67. For the $600 total liability plaintiff's share is $600/(1 + 1.67) = $600/2.67 = $225. Defendant's share is $600-$225 = $375. Defendant's liability computed from relative degrees of negligence is $50/$80 x $600 = $375.

32. This assumes no awareness of the other party's efforts at prevention as by communications between the parties.

33. The proof of this assertion is as follows: the least cost preventer of accident risk (alleged injurer in situation (4), victim in situation (6)), will inefficiently prefer to bear the liability rather than prevent the accident risk whenever the expected share of liability is less than the prevention cost, e.g., for situation (4), when $B_i / (B_i + B) \times (P \times L) < B_i$. This is algebraically equivalent to $B_i / (B_i + B) < B_i / (P \times L)$. The left hand side of the equation is the least cost preventer's (here, the injurer's degree of negligence), while the right side is the ratio of his prevention to risk cost.

34. The party that is not the least cost preventer will invest in prevention methods whenever the prospective liability share exceeds the prevention cost to him, whenever $B_i / (B_i + B) \times (P \times L) > B_i$ or, equivalently, whenever $B_i / (B_i + B) > B_i / (P \times L)$, Q.E.D.

35. It can be proved that of the four logical outcomes for apportionment of liability, i.e.,

(a) the least cost preventer avoids the accident risk,
(b) both prevent the risk,
(c) neither prevents the risk,
(d) the high cost preventer avoids the accident risk,
only the first three are practical possibilities. Apportionment occurs only where $B > P \times L$ for both parties. This occurs in situations (4) and (6). Both situations can be generalized by referring to the lower prevention cost party as "lc" and the higher as "hc". Situations (4) and (6) are then examples of:
Summary

Table I illustrates those situations in which present tort rules are inefficient. Pure negligence is inefficient in situation 6 because the injurer is held liable for the victim's injuries when the victim could have prevented the accident at a lower cost. The contributory negligence defense may correct the inefficiency in situation 6, but creates its own inefficiency in situation 4 by encouraging the victim, rather than the injurer, to take preventive measures. Strict liability is potentially the least efficient rule because the injurer is held liable without regard to the cost minimization criterion. If contributory negligence is a defense to strict liability, then the same inefficiencies result as when contributory negligence is a defense to pure negligence. Finally, conventional comparative negligence can be inefficient in situations 4 and 6 because the apportionment process encourages either both or neither of the parties to take preventive measures despite the fact that one party can do so at the least cost.

III. THE GALENA RULE

The Galena rule, interpreted as nonapportioned comparative negligence, avoids the inefficiencies that the present tort rules create. The rule is applied much like conventional comparative negligence in that the jury compares the relative degrees of negligence of each party and assigns a percentage of the total negligence to each party. It cures the inefficiencies of conventional comparative negligence, however, by eliminating the apportionment of liability. Once the jury has determined which party is most negligent, that party is assigned full liability for the accident. When parties choose how to act, they need not fear being assigned partial liability for an accident which could have been more inexpensively prevented by another party acting alone. If this Article's expression of a jury's intuition of the relative degrees of negligence is correct, the jury considers whether the parties were negligent and which could have prevented the accident at the lowest cost. The individual who could have prevented the accident for the least cost is

\[ P \times L > B_{hc} > B_h. \]

In an example of (d) above, where the high cost preventer avoids the accident risk, two conditions must simultaneously occur. First, the higher cost party's prevention cost must be less than anticipated liability,

\[ (i) \quad B_h < (P \times L) \times \left(\frac{B_{lc}}{B_{hc} + B_h}\right), \]

or

\[ (ii) \quad B_h < (P \times L) \times (B_{hc} + B_h). \]

Second, the lower cost party's prevention cost must be greater than anticipated liability,

\[ (iv) \quad B_{hc} > (P \times L) \times \left(\frac{B_{hc} + B_h}{B_{hc} + B_h}\right), \]

or

\[ (v) \quad B_{hc} > (P \times L) \times \left(\frac{B_{hc} + B_h}{B_{hc} + B_h}\right). \]

Combining (iii) and (v) yields

\[ (vi) \quad B_{hc} / B_h < (P \times L) / (B_{hc} + B_h), \]

or, more to the point,

\[ (vii) \quad B_{hc} / B_h < B_{hc} / B_h, \]

which can be true only if \( B_h > B_{hc} \). This formulation, however, is contrary to fact, as shown in inequality (i) above. For examples of outcomes (a), (b), and (c), see supra text accompanying notes 11-25.
the most negligent, and by being assigned full liability, is encouraged to avoid the accident efficiently.\textsuperscript{36} Illinois courts had applied the \textit{Galena} rule in varying forms for approximately thirty years during the 1800's. This section examines the factors leading to its rejection. The failure to minimize accident costs was not one of these factors.

\textit{The History of Galena}

\textit{Galena & Chicago Union R.R. v. Jacobs}\textsuperscript{37} involved a young child who was run over by the defendant's train. The accident occurred at a location where the residents of the area crossed the tracks, but was not designated a public crossing. The railroad claimed the child had been contributorily negligent in trespassing on railroad property. The trial court refused to allow the railroad to escape liability on this technicality and instructed the jury to treat the case as one of implied consent.\textsuperscript{38}

The Supreme Court of Illinois reversed the lower court finding of implied consent, but nevertheless allowed the child to recover by holding that contributory negligence is not a defense where the negligence of the plaintiff is slight and that of the defendant is gross.\textsuperscript{39} The distinction between slight and gross negligence was borrowed from the "degrees of negligence" rule which flourished in some states and in Europe during that period.\textsuperscript{40} The court went beyond the degrees of negligence rule, however, by requiring that the defendant's negligence be compared to the degree of care required of the plaintiff.\textsuperscript{41} The court stated that "the more gross the negligence manifested by the defendant, the less degree of care will be required of the plaintiff to enable him to recover."\textsuperscript{42}

By allowing the jury to balance the negligence of one party against the negligence of the other, the \textit{Galena} court created one of the first modern comparative negligence rules. Because apportionment of liability was not yet widely accepted, the jury assigned full liability to the party whose negligence was greater. That party's negligence usually was characterized as gross, while the exonerated party's negligence was characterized as relatively slight.

\begin{itemize}
\item \textsuperscript{36} Note that accident cost minimization can also be achieved by placing the liability on the least cost preventer regardless of negligence. Thus, in situations (1) and (2), the least cost preventer, victim or alleged injurer, respectively, would be liable. There would be no incentive in either case to prevent the accident risk and an efficient result would occur. The distributional result discussed in Section IV of this Article, however, would be different from that in any of the rules considered above. This line of reasoning is suggested in Calabresi & Hirschoff, \textit{Toward a Test for Strict Liability in Torts}, 81 \textit{Yale L.J.} 1055, 1076-84 (1972).
\item \textsuperscript{37} 20 Ill. 478 (1858).
\item \textsuperscript{38} \textit{Id.} at 481.
\item \textsuperscript{39} \textit{Id.} at 497.
\item \textsuperscript{40} \textit{See generally}, W. PROSSER, \textsc{Handbook of the Law of Torts} § 34, at 180-87 (4th ed. 1971) [hereinafter cited as \textsc{Prosser}]; Elliott, \textit{Degrees of Negligence}, 6 \textit{S. Cal. L. Rev.} 91, 114-24 (1933).
\item \textsuperscript{41} 20 Ill. at 497.
\item \textsuperscript{42} \textit{Id.}.
\end{itemize}
For approximately thirty years following Galena, the lower courts in Illinois attempted to apply the comparative negligence rule derived in that decision but their efforts resulted in a deluge of appeals and considerable confusion.\textsuperscript{3} The rule gradually evolved into a contributory negligence rule\textsuperscript{4} and was finally abandoned in 1894.\textsuperscript{41}

The rejection of the Galena rule has been attributed to four factors: (1) the morality of the fault principle; (2) a pro-industrial defendant bias on the part of the judiciary; (3) the confusion caused at the trial court level concerning the proper procedures for implementing the new rule and defining relative degrees of negligence; and (4) the pressure from other jurisdictions to adopt contributory negligence as a defense.\textsuperscript{42}

The fault principle was the prevalent theory underlying tort law during the Galena era. Although fault remains an important theory in tort law today, the notion of fault at the time of Galena was thought to require that the negligent defendant be absolved of all liability if the plaintiff was also tainted with negligence rather than to allow the plaintiff to recover damages from the defendant. One commentator noted that "[s]trict morality would not permit a litigant to profit by his own wrong."\textsuperscript{7} Because the Galena rule permitted a negligent plaintiff to recover damages when the defendant was grossly negligent, the rule ran against the grain of contemporary ethics, and thus was severely criticized by legal scholars of that day.\textsuperscript{8}

The Galena rule also conflicted with the general judicial bias in favor of the industrialization of America at the expense of individual rights.\textsuperscript{9} When


44. \textit{See} Calumet Iron & Steel Co. v. Martin, 115 Ill. 358, 368, 3 N.E. 456, 460 (1885) (to recover for injuries under negligence theory, injured party must plead and prove that he observed ordinary or due care).

45. \textit{See} City of Lanark v. Dougherty, 153 Ill. 163, 38 N.E. 892 (1894); Lake Shore & Mich. S. Ry. v. Hessions, 150 Ill. 546, 37 N.E. 905 (1894). In \textit{Dougherty}, the City of Lanark appealed from a jury verdict in favor of plaintiff in a negligence action, claiming the jury instructions given ignored the rule of comparative negligence. 153 Ill. at 165, 38 N.E. at 893. Rejecting the city's claim, the court stated:

\begin{quote}
The doctrine of comparative negligence is no longer the law of this Court. The instructions in the present case require the jury to find that the plaintiff was exercising ordinary care, and that the defendant was guilty of such negligence as produced the injury. This was sufficient, without calling the attention of the jury to any nice distinctions between different degrees of care or of negligence.
\end{quote}

\textit{Id.} at 165-66, 38 N.E. at 893.


47. \textit{Id.} at 48.

48. \textit{See}, e.g., T. COOLEY, \textit{A TREATISE ON THE LAW OF TORTS} § 323, at 644-45 (A. Throckmorton ed. 1930) (rule criticized for failure to realize that ordinary care may include some want of care); 1 S. THOMPSON, \textit{COMMENTARIES OF THE LAW OF NEGLIGENCE} §§ 259-86, at 242-70 (1901) (rule of Galena actually less favorable to plaintiff than the rule of contributory negligence).

a train hit a plaintiff or a plaintiff’s possession, the judges sought some means of influencing the jury to protect the railroad from liability. The fault principle provided some shelter, and the defense of contributory negligence enabled an appellate court to reverse a verdict for the plaintiff upon discovering from the trial record an iota of negligence by the plaintiff. To overturn a jury finding under the *Galena* rule, however, the appellate court would have to dig much deeper into the trial record to justify a finding that the plaintiff’s negligence had been greater than the defendant’s negligence. Because the *Galena* rule limited judicial control over juries, the appellate courts pressed for its rejection.  

The third factor leading to the demise of the *Galena* rule was the confusion it caused at the trial court level. The *Galena* court failed to specify a procedure for applying the new rule and the courts failed to develop a procedure of their own. This failure lead to a flood of appeals. The temptation to return to the simplicity of contributory negligence proved too great and the *Galena* rule was rejected.  

Another source of confusion arose from the language of the *Galena* court when it stated: ‘‘whenever it shall appear that the plaintiff’s negligence is comparatively slight, and that of the defendant gross, he shall not be deprived of his action.” Although the value of the *Galena* rule arises from the comparative aspect of the rule and not from its degrees of negligence aspect, courts failed to distinguish these two aspects. Under the degrees of negligence rule, negligence is categorized into one of three areas: slight, ordinary, or gross, with a different rule of liability assigned to each area. Confusion arose, however, in attempting to define more explicitly each category and in attempting to instruct the jury how to pigeonhole a particular act into one of the categories. The *Galena* rule appeared unworkable and was rejected by most states except in bailment and aggravated negligence cases.

50. *Id.* at 164-69.  
52. See APPENDIX.  
53. See *supra* note 45.  
54. 20 Ill. at 497. While it might be inferred that this standard still permits an affirmative defense of ordinary or gross contributory negligence by a plaintiff, no such defense would be included in the efficient comparative negligence rule described in this Article.  
56. Wabash St. L. & P.R.R. v. Moran, 13 Ill. App. 72, 76-77 (1883). ‘‘Negligence . . . may be of three degrees, viz.: ’slight negligence,’ which is defined to be the want of great care and diligence, ‘ordinary negligence,’ which is the want of ordinary care and diligence, and ’gross negligence,’ which is the want of even slight care and diligence.” *Id.*  
57. See *supra* notes 39-42 and accompanying text.  
58. See Chicago, R.I. Pac. Ry. v. Hamler, 215 Ill. 525, 536, 74 N.E. 705, 709 (1905) (negligence cannot be divided into slight, ordinary, and gross by definite lines so that a jury can understand the limits of each and assign each case to its own department).  
59. See *PROSSER,* supra note 40, § 34, at 182.
The final factor leading to the rejection of the Galena rule was the isolation Illinois experienced from pioneering in comparative negligence. Kansas and Tennessee were the only other states to experiment with comparative negligence, but they quickly abandoned their efforts. Surrounding, criticized, and influenced by those who espoused contributory negligence, Illinois finally surrendered. One scholar remarked in retrospect, "[w]hat was happening here is clear. The doctrines of other courts were infiltrating the negligence doctrines of the Illinois court and supplanting the home-grown product."

The pressure towards uniformity of tort rules, especially when interstate carriers were involved, eventually put the Galena rule to rest.

The Galena rule was not rejected for reasons related to inefficiency in minimizing accident costs. Although the factors which led to Galena's demise—the fault principle, a sympathetic attitude toward corporate defendants, and the need for uniformity of rules—are factors the courts or legislature might consider when adopting a new rule of law, they are immaterial to the goal of primary accident cost reduction. A reconsideration of these factors also reveals that they no longer necessarily lead to the rejection of the Galena rule.

With respect to the fault principle, the notion that a negligent plaintiff should not recover from a negligent defendant has been expressly rejected by a majority of the states. Comparative negligence, as currently applied, permits a plaintiff to recover for the portion of his injuries corresponding to the percentage of negligence attributable to the defendant. If assessing liability according to fault is the goal, then at the very least nonapportioned liability under the Galena comparative negligence rule is Pareto superior to contributory negligence in that, under this Article's interpretation of the Galena rule, full liability never rests on the less negligent party.

Further, corporate defendants are no longer afforded a clear judicial preference. The wave of consumer protection laws and the re-emergence of strict products liability indicate a preference today for plaintiffs rather than for corporate defendants. If the Galena rule was adopted to replace the defense of contributory negligence it would provide plaintiffs with another avenue of recovery. This rule also would increase the plaintiff's amount of recovery in conventional comparative negligence jurisdictions. On the other hand, the Galena rule protects the defendant from liability where the plaintiff has the lower accident prevention cost.

60. Versions of the Galena rule were adopted in Union Pac. Ry. v. Rollins, 5 Kan. 98, 108 (1869) and Whirley v. Whiteman, 38 Tenn. 610, 622-23 (1858), but were subsequently rejected in Atchison, Topeka & Santa Fe R.R. v. Morgan, 31 Kan. 77, 80, 1 P. 298, 300 (1883) and East Tenn., Va. & Ga. R.R. v. Gurley, 80 Tenn. 46, 55-56 (1883).

61. See Elliott, Degrees of Negligence, 6 S. CAL. L. REV. 91, 135-37 (1933).


63. At least 38 states, either by statute or by case law, have adopted a comparative negligence system. For a complete listing of these states, see C.R. Heft, & C.J. Heft, COMPARATIVE NEGLIGENCE MANUAL 118-19 app. II (Supp. 1982).
The factor most relevant to the cost minimization goal is the confusion the *Galena* decision created at the trial court level. A rule leading to numerous appeals can hardly be said to be cost effective. A review of those appeals reveals that it was not only the novel nonapportioned comparative negligence feature that troubled the trial courts, but also that the Illinois appellate courts seemed unwilling to apply the *Galena* rule to corporate defendants, particularly railroads.

In the thirty-six years during which the *Galena* rule existed, fifty-nine cases applying the *Galena* rule were reported from the Illinois appellate courts. The great frequency of corporate, business, or municipal defendants in these appeals, especially railroads, permits one to test the theory that appellate courts found juries treating corporate defendants too harshly. It may have been appellate court leniency toward corporate defendants that encouraged the frequent appeals and appellate court attempts to limit the jury's ability to find for individual plaintiffs that caused the confusion.

Corporate, business, and municipal appellants had a success rate of almost seventy percent at the appeals level. Railroads were even more successful, prevailing in 74.4% of their appeals. Of the eighteen victories for individuals who were plaintiff-appellees, three were against municipal-appellants, which arguably would not receive as much protection from a pro-industrial bench as a corporation. Ten of the remaining fifteen plaintiff-appellee victories were suits by employees against employers for work-related injuries. These also might be eliminated from the determination of the success rate because the effect of any pro-industrial bias would not be as powerful in such a case. Eliminating the three municipal and ten employee-employer cases reveals a success rate for corporate appellants of eighty-three percent.

Even in cases of death or personal injury where a pro-industrial bench might have been sympathetic to the plaintiff, only

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64. The expenses of administering a rule designed to minimize primary accident costs are described by Calabresi as "tertiary" costs. See THE COSTS OF ACCIDENTS, supra note 6, at 28.

65. The 36 year period referred to extends from 1858 when *Galena* was decided to 1894 when Lake Shore & Mich. S. Ry. v. Hessions, 150 Ill. 546, 37 N.E. 905 (1894) and City of Lanark v. Dougherty, 153 Ill. 163, 38 N.E. 892 (1894), clearly discarded the *Galena* rule. See supra note 45. The change back to contributory negligence took place gradually throughout this time period and it might be argued that by the time Calumet Iron & Steel v. Martin, 115 Ill. 358, 3 N.E. 456 (1885) (evolution of contributory negligence rule), was decided, the Supreme Court of Illinois effectively had eliminated the impact of *Galena*. Some indication exists, however, that the court views the 1894 date as the end of the *Galena* rule, and the authors also assumed this position. See Maki v. Frelk, 40 Ill. 2d 193, 199-200, 239 N.E.2d 445, 448-49 (1968) (Ward, J., dissenting). Pertinent characteristics of the 59 cases are discussed in the APPENDIX.

66. Fifty-seven of the 59 defendants (96.6%) and 56 of the 59 appellants (94.9%) were corporations, businesses, or municipalities.

67. Forty-four of the 59 defendants (74.5%) were railroads. In 43 of these 44 cases the railroads were appellants.

68. Thirty-nine of 56 corporate and 32 of 43 railroad appeals were successful.

69. Thirty-four victories for corporations appeared in 41 appeals from jury verdicts in favor of non-employee plaintiffs.
seven plaintiff victories appear—a corporate success rate of eighty-one percent.

Note that in each of three cases in which an individual appealed, he was successful. In one of these cases appellee was another individual which would not cause a pro-industrialist bench conflict; but in a second case decided for an individual appellant, appellee was a railroad.

These statistics demonstrate the success of corporate defendants in appellate courts. The percentages themselves do not establish a pro-industrial bias on the part of appellate courts, but they do corroborate one author’s conclusion that, ""[u]ppermost in the minds of both judges and lawyers of the time was a seething, although somewhat covert, dissatisfaction over the part they felt the jury was destined to play in these cases against corporate defendants."

Although this history suggests a motive for the rejection of the Galena rule, it does not reveal the methods by which confusion was sown in the lower courts. The justification for reversal depended on the grounds on which the corporate appeal was based. The two means of corporate attack on a jury verdict in favor of an individual plaintiff were to allege that the jury was instructed improperly as to comparing the relative degrees of negligence between the negligent plaintiff and the negligent defendant, or that the verdict was not supported by the evidence. It was more difficult for an appellate court to justify a reversal on the basis of insufficient evidence because it had to examine the trial record closely and make its own comparison of the relative degrees of negligence. Perhaps because of this difficulty, only eight of the fifty-nine appeals proceeded on this ground. When the court reversed a verdict on the basis that the verdict was not supported by the evidence, it found in every case that the plaintiff’s negligence was more than "slight."

This form of reversal allowed the court to reverse a plaintiff’s verdict in much the same manner as a contributory negligence court would reverse a plaintiff’s verdict. The characterization of the plaintiff’s negligence as slight was founded in the "degrees of negligence" rule. As mentioned earlier, the Galena rule was not a pure form of comparative negligence in that it was

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70. Thirty of 37 appeals by corporations against plaintiffs suffering death or personal injury were successful.

71. The third individual appellant was a surgeon defendant who won a reversal against a patient.


73. See, e.g., Village of Kewanee v. Depew, 80 Ill. 119, 121 (1875) (plaintiff guilty of more than slight negligence for not looking where he was walking); Grand Tower Mfg. & Transp. Co. v. Hawkins, 72 Ill. 386, 389 (1874) (plaintiff guilty of high degree of negligence for entering portion of wharf boat not intended for passenger traffic); Illinois Cent. R.R. v. Hall, 72 Ill. 222, 226 (1874) (plaintiff negligent for walking on railroad tracks when there was a path running alongside the tracks); Chicago & A.R.R. v. Gretzner, 46 Ill. 74, 83 (1867) (plaintiff guilty of high degree of negligence for crossing railroad tracks without looking or slowing down); Chicago, B. & Q.R.R. v. Hazzard, 26 Ill. 373, 386-87 (1861) (plaintiff guilty of more than slight negligence for not exercising ordinary care when alighting from train).
clouded by this degrees of negligence rule. Rather than merely comparing the relative negligence of the plaintiff and the defendant, juries instructed under the Galena rule were forced to pigeonhole each party's negligence into one of three categories: slight negligence, ordinary negligence, or gross negligence. The Galena rule permitted a negligent plaintiff to recover only if the plaintiff's negligence was slight and the defendant's negligence gross. In applying this form of comparative negligence, however, the Illinois appellate courts twisted the definition of slight negligence to include a lack of ordinary care by the plaintiff.74

By equating slight negligence with lack of ordinary care by the plaintiff, an appellate court easily could overturn a plaintiff's verdict by finding any want of ordinary care by the plaintiff in the trial record. This reduced comparative negligence to the same standard of care required of the plaintiff under contributory negligence. Once this sleight of hand trick had been performed, the appellate courts centered their attention on reviewing jury instructions to ensure that they informed the jury that the plaintiff had to act with ordinary care. Fifty-two of the fifty-nine cases reviewing the Galena rule at the appellate level involved questions of proper jury instructions.75

The fifty-two cases appealed on the basis of jury instructions created confusion for the trial courts because the rule of nonapportioned comparative negligence was gradually being converted to the traditional contributory negligence rule. With no constant standard to apply, it is not surprising that confusion reigned among lower courts.

There is no reason to believe that confusion would remain if the rule of nonapportioned comparative negligence was adopted today. The degrees of negligence rule has been rejected in most jurisdictions76 and courts in con-

74. See, e.g., Coursen v. Ely, 37 Ill. 338 (1865). In Coursen the court stated:

The jury are instructed that in determining the question of negligence, they are
to take into consideration the situation of both parties, and that if they believe
from the evidence that the injury was caused by the negligence or fault of defen-
dant's driver, without any greater want of skill or care on the part of plaintiff's
driver, than could reasonably be expected of a person of ordinary prudence and
skill, in such a situation as he was, that the plaintiff is entitled to recover.

We see no objection to these instructions. If, in cases of this character, the
defendant has been guilty of negligence, and the plaintiff has shown all the care
and skill which can be expected from men of ordinary prudence in like cir-
cumstances, then the plaintiff is entitled to recover. . . . [T]his court has held in
Galena & C.R.R. v. Jacobs . . . that although the plaintiff may be guilty of some
degree of negligence, yet if it is but slight as compared with that of the defendant,
the plaintiff shall be allowed to recover.

Id. at 340-41 (citation omitted).

75. See, e.g., Calumet Iron & Steel v. Martin, 115 Ill. 358, 3 N.E. 456 (1885) (upholding
jury instruction which dictated recovery for plaintiff if jury found he had exercised ordinary
care); Illinois Central R.R. v. Trowbridge, 31 Ill. App. 190 (1888) (erroneous to instruct jury
that plaintiff might recover if negligence of defendant was of a higher degree than that of
plaintiff and to instruct jury that defendant was required to prove plaintiff did not exercise ordinary
care). For a listing of the 52 cases reviewed on the basis of jury instructions, see APPENDIX.

76. PROSSER, supra note 40, § 34, at 182.
ventional comparative negligence jurisdictions have become familiar with instructing juries to compare the relative negligence of the parties. This Article's interpretation of the Galena rule simplifies present comparative negligence instructions by removing the apportionment process. Rather than assigning a percentage value to each party's negligence, the jury must only determine which party was the more negligent. The Galena rule would not be a source of confusion today as it was in Illinois during the late 1800's.

Finally, the lack of uniformity between the Galena rule in Illinois and the rules in neighboring states is more of an historical explanation than a theoretical or practical judgment on the rule's social utility. The deterrent value of any rule might be weakened by the uncertainty generated by a lack of uniformity. However, if uniformity is a goal, uniform adoption of a superior rule is preferred.

*Contemporary Criticism of Galena*

The Galena rule has been criticized as being no more efficient than present tort rules. The three reasons underlying this criticism are: (1) the Galena rule does not account for complementary methods of accident risk prevention that might be less costly than independent prevention by either party; (2) the Galena rule does not resolve the inefficiencies created by the doctrine of last clear chance; and (3) the ignorance of relevant information needed to assess and act on incentives provided by the Galena rule is likely to diminish the deterrent value of the rule. In addressing these criticisms, it should be recognized that the lack of perfect information on the part of the parties and juries, as well as personal preferences for laxity in compliance with safety standards over maximizing dollar wealth, may result in behavior that does not minimize accident costs. However, given such universal problems, a liability rule that is superior to all other rules should be sought and defended.

*Complementary Measures*

Previous discussion has demonstrated the inefficiency of apportioned comparative negligence in some cases where independent prevention methods are appropriate. Professor Schwartz suggests that nonapportioned

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77. See *Contributory and Comparative Negligence,* supra note 4, at 704-10 (1978). Criticism characterizing comparative negligence as a game-playing strategy between parties does not apply to the Galena rules. Schwartz maintains that the low cost party has an incentive to "bluff" inaction so as to persuade the high cost party that it is in his economic interest to incur the safety expenditure. *Id.* at 706-07. This economic interest arises out of the apportionment of liability under traditional comparative negligence, however, which is not a feature of the Galena rule.

78. This is one implication of Professor Schwartz's discussion of the psychological aspects of contributorily negligent behavior. *Id.* at 713.

79. See *supra* notes 30-35 and accompanying text, which articulate the precise conditions under which an inefficient result will occur. See generally, *Contributory and Comparative Negligence,* supra note 4, at 707.
comparative negligence also may produce an inefficient result when complementary prevention measures are the least cost alternative. His example is one in which independent measures to prevent a $100 risk would cost the injurer and the victim sixty dollars and sixty-five dollars respectively while complementary measures would cost nine dollars and ten dollars respectively. The combined cost of nineteen dollars is the least cost alternative. Schwartz argues that the victim has no incentive to participate in complementary measures because he can save ten dollars by forcing the injurer to prevent the accident risk independently.\textsuperscript{80}

The distinction between independent and complementary prevention measures is illusory. Complementary measures involve either contractual relationships between the parties which describe a coordinated approach to the prevention of accidents or uncoordinated but parallel acts by the parties which, when completed by each party, result in the prevention of accidents. Whether the cooperation is coordinated and contractual or uncoordinated but parallel, the complementary measures become an alternative to independent prevention methods.

Consider the contractual perspective. As in any contract, the parties must tender consideration. In the above example, the potential injurer's consideration is nine dollars and the potential victim's consideration is ten dollars. Tendering consideration, like any independent prevention measure, is a unilateral act. Consequently, the injurer's prevention costs is not sixty-five dollars but merely the nine dollar consideration tendered to the victim for the complementary measure. If the injurer has tendered his nine dollars, his alternative prevention cost is the sixty-five dollar measure. The victim now has the least cost prevention method, a ten dollar consideration for the complementary measure, and he will incur this cost rather than assume the $100 risk. Properly viewed, the \textit{Galena} rule, by assigning liability to the party with the lower cost of prevention, encourages entering into the contract, which is necessary to carry out prevention methods that require coordination.

Complementary prevention measures requiring coordination will be efficient only when the costs of transactions are low. To determine whether it actually is the lowest accident risk prevention cost, costs of contracting and negotiating with potential victims and of enforcing agreements must be included in the costs of executing the complementary measure.

Prevention methods exist that do not require independent or coordinated action to eliminate the risk completely, but that do require each party to take unilateral and parallel steps to decrease the probability that the accident will occur. If both actions occur, the accident will be prevented by unconscious parallel behavior rather than teamwork. An example is suggested by John Prather Brown who criticizes contemporary tort rules for not encouraging incremental accident prevention—less than complete prevention by each party that combines to eliminate the accident risk.\textsuperscript{81} The least cost

\textsuperscript{80} \textit{Id.} at 705.

method of eliminating falls on slippery sidewalks is for the sidewalk owner to remove most of the ice and for pedestrians to walk fairly carefully. Neither acting alone would eliminate all accidents but it can be assumed that acting together they will. If the least cost portion of the complementary measure is removing the ice and the second least cost complementary measure is walking carefully, then we have a situation similar to the contractual hypothetical. The owner has "tendered his consideration" by the unilateral act of shoveling the walk. The walker can either "accept" and "tender his careful walking," or he may pay more for complete independent prevention such as wearing spiked snowshoes or assume the accident risk cost.  

No explicit coordination is necessary, yet complementary acts are required and encouraged by the Galena rule.

Interpreting all prevention methods as beginning with a unilateral act converts them into independent acts. The unilateral act is either a tender of consideration where coordination is required, or in what is probably the more likely case, an initial performance by the party whose portion of the measure is less costly. In either case, the Galena rule encourages the least cost method of preventing accidents.

**Last Clear Chance**

The notion behind the last clear chance doctrine is essentially temporal in nature. The injurer is assumed to be acting with due care until such time as the victim fails to extricate himself, either because of inattention or helplessness, from a perilous situation. In cost minimization terms, the victim is the least cost avoider until it is too late for him to prevent the accident. At that point his prevention costs become infinite. If the injurer knew or should have known of the danger to the victim created by the injurer's activity and had a chance to prevent the accident risk at a cost less than the cost of assuming the risk, the injurer will be held liable if he fails to prevent the risk. The injurer's behavior is not negligent until the victim's predicament is such that an accident is likely to occur and the injurer fails to prevent it.  

It is important from a cost minimization viewpoint to encourage the victim to

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82. In such a hypothetical, the equations get more complicated. The sidewalk hypothetical assumes \((P \times L) > B^1_i > B^2_i > B^1_w > B^2_w\) and \((B^1_i + B^1_w) < B^2_i\), where the superscripts 1 and 2 describe the complementary and independent prevention measures respectively. In the slippery sidewalk case, \(B^1_i\) would be removing most of the ice; \(B^1_w\) would be walking carefully; \(B^2_i\) would be cleaning the sidewalk of all ice, snow, and water; and \(B^2_w\) would be finding an alternative to walking. \(B^1_i\) in this case is the least cost alternative but alone will not prevent all accidents. The Galena rule encourages the least cost preventer to initiate the complementary method and then encourages the second least cost preventer to contribute his share.

83. The situation where the victim rather than the injurer has the last clear chance collapses to the basic defense of contributory negligence with a temporal element. Here, the victim is presumed to have been reasonably able to escape the effects of injurer's negligence but failed to do so. Although rules which consider this type of contributory negligence as falling within the last clear chance doctrine are in great disrepute, see PROSSER, supra note 40, § 66, at 429, the textual analysis would also apply to these rules.
prevent the accident initially. If that fails and the victim's prevention cost becomes infinite, the injurer should be encouraged to prevent the accident. The difficulty arises when the victim knows the injurer will be held liable for the victim's failure to act. Under this circumstance, the victim has no incentive to prevent the accident. The victim could be provided with the necessary incentive by decreasing his recovery by the amount of his initial prevention cost. This, however, would require assigning a quantitatively difficult task to the factfinder. Without a cure for the disincentive provided by last clear chance, the doctrine creates a difficulty for the Galena rule as for other tort rules. The difficulty arises, of course, only when the victim is indifferent between preventing the accident and being fully compensated for the injuries that might result from the accident.

Although the last clear chance doctrine theoretically poses a problem to the Galena rule, economic analysis need not be abandoned. A determination of whether the Galena rule would be more efficient with or without the last clear chance doctrine can still be made. The decision whether to accept or reject the doctrine boils down to a choice of the lesser of two evils. The Galena rule without the doctrine of last clear chance appears to minimize accident costs better because it provides the victim, who is the least cost preventer of the accident, with incentives to prevent accident risks when appropriate. If the victim foregoes his prevention opportunity, the loss to society is the difference between the risk assumption cost and the victim's prevention cost. When last clear chance doctrine is applied, the victim theoretically never has an incentive to prevent the accident. The loss to society is the difference between the victim's and the injurer's costs of prevention. The social choice is between the occasional larger loss associated with the absence of the doctrine of last clear chance and the assured smaller losses associated with utilizing the doctrine. For either loss to occur, the temporal element of last clear chance must be present. The temporal element, however, is not always present in tort situations. Of the set of situations where the temporal element exists, those situations in which the victim errs are a subset. It is difficult to know a priori whether the infrequent larger losses will outweigh the assured smaller losses. At the least, this dilemma arises in the same magnitude under all liability rules. Without the adoption of the last clear chance doctrine, however, the Galena rule always produces a cost minimizing result when the parties correctly assess and act on the incentives provided. No other liability rule can claim as much.

The Problem of Ignorance

Schwartz alleges that the informational requirements of the Galena rule are so high that parties will be unable to assess and act properly on the incentive provided. This same criticism is directed toward the ability of the jury to

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84. See Contributory and Comparative Negligence, supra note 4, at 709.
weigh accurately the information so as to provide correct incentives.\(^5\) Schwartz notes that any type of contributory negligence rule adds to the number of quantifications the parties and a jury must make.\(^6\) For optimal deterrence under *Galena*, he asserts that each party must be able to compare the risk assumption cost with both parties’ prevention costs. Under apportioned comparative negligence, the parties also must determine the relative prevention costs. Indeed, the informational requirements under the rule of apportioned comparative negligence are likely to be higher than those under the *Galena* rule.

Apportionment of liability is, relatively speaking, an informational nightmare. If liability is not apportioned, the parties before the fact and juries after the fact merely are required to determine whose behavior has more egregiously violated societal standards of reasonable care. The development of precedents in various areas aid each party in this evaluation process. The design of the *Galena* rule is such that in cases where the jury and the parties are least liable to determine who was more negligent, the impact of error on cost minimization is least important. If each party's costs of prevention are close and are less than the cost of the accident risk, the placement of liability is not a major concern. When both costs are widely divergent, the jury and the parties clearly will know who was more negligent.

When costs of prevention are close and inaccurary is a problem, greater danger to cost minimization exists under the *Galena* rule from duplication or total neglect of efficient prevention by the parties. This same danger to cost minimization is also present with traditional contributory negligence and negligence without a contributory negligence defense whenever prevention costs are close to the risk assumption costs. Fortunately, under a negligence rule without a contributory negligence defense, it is relatively unimportant whether the defendant is found to be negligent because the cost to society is the same.\(^7\) When contributory negligence is applied, an uncertainty as to the negligence of the plaintiff is of societal significance because the result of any error may be to encourage the plaintiff to prevent the accident even though the defendant might do so at a much lower cost.

Little can be said about the comparative costs of error under the alternative defenses without determining in which categories of cases inaccuracies are likely to arise. The approach to such an inquiry would be similar to that of Calabresi and Hirschoff\(^8\) who, in analyzing the comparative advantages of strict liability, recommend the application of strict liability to those categor-

\(^5\) Id. at 709 n.52.

\(^6\) Id.

\(^7\) The potential for inefficiency still exists in a rule of negligence without the defense of contributory negligence, but it is due to the nature of the rule and not to the error in jury evaluation.

ies of cases where the likelihood of associated errors is smallest. Following this approach, a detailed category-by-category analysis of the likely cost of error would be required to reach a firm conclusion. There is, however, no reason to believe a priori that any other liability rule is superior to the Galena rule in reducing the cost of errors.

IV. OTHER GOALS OF THE TORT SYSTEM

The ability of the rule of nonapportioned comparative negligence to achieve the goal of minimizing the costs arising from accidents and the prevention of accidents has been evaluated in this Article. The goal of cost minimization, however, is not the only goal that can be analyzed using the six situations earlier developed. By a similar analysis, the ability of alternative tort rules to achieve compensation, safety, and fairness goals, among multitudinous others, can be inferred.

For instance, if the predominant societal goal is safety, then the superior rule deters the most accidents. In discussing the safety inducing characteristics of a rule, a rule may be viewed as effective in a particular factual situation if accident avoidance is encouraged by the assignment of liability. In Table II, (next page) $E^S$ denotes an effective, accident avoiding rule from the safety perspective, while $F$ denotes an accident inducing application of each rule. In situations 1, 2, and 3, all of the rules are equivalent in that accidents are not deterred in situations 1 and 2 and are deterred in 3 regardless of the liability rule chosen. When situations 4 and 6 are considered, the rule of apportioned comparative negligence is inferior to the other five rules. Apportioning liability will fail to deter accidents in situations 4 and 6 where accident prevention costs are high for both parties. The pure strict liability rule does not deter accidents in situation 5. Thus, although with respect to safety, apportioned comparative negligence and pure strict liability are inefficient, society may be indifferent about the other four rules. No rule analyzed prevents more accidents than the rule of nonapportioned comparative negligence.

If the compensation goal is interpreted as preferring a rule which always fully compensates an injured party, then pure strict liability is the superior rule. Pure negligence and strict liability with contributory negligence offers the second best alternative with the compensation goal unreached in half of the six situations. In the six situations analyzed, each of the remaining rules fails to reach the compensation goal more often than it succeeds.

Compensation of injured parties is an unusual goal to consider alone because the compensating party, after having paid, seems to have become a victim of the accident. Fortunately, this analytical method is not restricted to examining one goal at a time. It is presumptuous in an article such as this to define fairness. For the purpose of demonstrating the methodology, however, consider the following possibility. If “fairness” is interpreted as combining the compensation goal with both the revenge motive and the fault principle, society’s goal might be to punish the party more at fault by requiring full compensation of the less faulty party for injuries suffered.
<table>
<thead>
<tr>
<th>TORT RULE</th>
<th>(1) ( B_i \Box B_j \Box P xL )</th>
<th>(2) ( B_j \Box B_i \Box P xL )</th>
<th>(3) ( B_j \Box P xL \Box B_i )</th>
<th>(4) ( P xL \Box B_j \Box B_i )</th>
<th>(5) ( B_j \Box P xL \Box B_i )</th>
<th>(6) ( P xL \Box B_j \Box B_i )</th>
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<tr>
<td>Pure Negligence</td>
<td>( I^s, I^c, E^f )</td>
<td>( I^s, I^c, E^f )</td>
<td>( E^s, E^c, E^f )</td>
<td>( E^s, E^c, E^f )</td>
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<td>Contributory Negligence</td>
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<tr>
<td>Pure Strict Liability</td>
<td>( I^s, E^c, I^f )</td>
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<tr>
<td>Strict Liability with Contributory Negligence</td>
<td>( I^s, E^c, I^f )</td>
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<td>Nonapportioned Comparative Negligence</td>
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\( E \) = Effective in reaching safety (\( E^s \)), compensation (\( E^c \)), or fairness (\( E^f \)) goals.
\( I \) = Ineffective in reaching these goals.
\( I^* \) = Partially or sometimes ineffective in reaching goals.
Table II reveals that the rule of nonapportioned comparative negligence is the only rule effective in reaching this goal in all six logical situations. The designations for the fairness goal assume that no compensation is paid by a party not at fault. Other goals or definitions of fairness are possible, of course, where the rule of nonapportioned comparative negligence is not clearly superior.

This analytic framework is not the only utility of economic analysis. This approach also demonstrates exactly what society sacrifices when it chooses a liability rule. Strict liability without contributory negligence may satisfy distributional concerns by forcing corporate defendants in products liability cases to compensate consumers. There is a cost to society, however, of achieving the distribution through such a rule. That cost may be an increase in the number of accidents, an increase in the cost of preventing accidents, or an increase in the price of the product. Distributional questions can be distinguished from the efficiency issues discussed by comparing the former to deciding how to divide up the pie, and the latter to determining how big the pie is to be. Placing liability on a party other than the least cost preventer of accidents, who is characterized as the most negligent, results in a smaller pie to divide. Not only does economic analysis provide no persuasive rational for choosing a particular rule, but this analysis also reveals the implications of choosing any rule.

CONCLUSION

The Galena rule of nonapportioned comparative negligence achieves goals traditionally considered economic in nature better than any contemporary tort rule. It provides parties engaged in activities that are associated with injuries, incentives to prevent accidents whenever it is economically feasible. It never encourages prevention at a cost higher than that minimally necessary even when the least cost prevention method requires complementary efforts by the parties. In practice, it is easier to implement than the apportioned comparative negligence because it requires less complicated information and mathematical calculations by the parties and juries involved. This implies an increased likelihood of appropriate decisions by juries and appropriate behavior by individual parties. No tort rule other than non-apportioned comparative negligence can make such extravagant claims. Moreover, the Galena rule operates on the basis of fault, thereby providing a moral basis for its acceptance.
APPENDIX

Key for Appendix
1. "*" indicates appellant.
2. "+" indicates winner on appeal.
4. "J.I." indicates that a challenged jury instruction was the basis for the appeal.
5. "P.I." indicates that plaintiff suffered personal injuries.
6. "Negligence not slight" indicates that the basis of the appeal was defendant's contention that plaintiff's negligence was greater than "slight".
7. "D" indicates that the victim died as a result of defendant's alleged negligence.

<table>
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<th>INJURY</th>
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