# ARTICLE

# PUNITIVE DAMAGES: HOW JURORS FAIL TO PROMOTE EFFICIENCY

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*Evidence of corporate risk-cost balancing often leads to inefficient punitive damages awards, suggesting that jurors fail to base their decision-making on principles of economic efficiency. In this Article, Professor Viscusi presents the results of two experiments regarding jury behavior and punitive damages. In the first experiment, Professor Viscusi found that mock jurors punish companies for balancing risk against cost, although award levels vary depending on how the economic analysis is presented at trial. The results of the second experiment suggested that mock jurors are unwilling or unable to follow a set of model jury instructions designed to generate efficient damages awards. Professor Viscusi concludes that neither risk-cost analysis nor this particular set of instructions can encourage jurors to behave efficiently. As a result, damages awards may create undesirable incentives for companies making choices about safety.*

## I. INTRODUCTION

The challenges associated with determining punitive damages loom among the greatest difficulties juries face in our civil justice system.[1] It is well known that juries may fail in some respects. The more interesting issue is whether jury performance can be improved, or whether jury failings can be eliminated altogether.

What do we mean by juror performance being a success or failure? Three different reference points will be used in this Article. The first and most rigorous reference point is that punitive damages should be efficiency-enhancing. Jurors should set levels of punitive damages so as to create efficient incentives for deterring reckless behavior. Firms consequently should have financial incentives to take the appropriate degree of care and manufacture sufficiently safe products.

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[1] For an analysis of jurors' inability to translate their outrage into dollar awards, see Cass R. Sunstein, Daniel Kahneman & David Schkade, *Assessing Punitive Damages (with Notes on Cognition and Valuation in Law)*, 107 YALE L.J. 2071 (1998). Punitive damages' failure to produce beneficial safety effects is the focus of W. Kip Viscusi, *Why There Is No Defense of Punitive Damages*, 87 GEO. L.J. 381 (1998). *See also* W. Kip Viscusi, *The Social Costs of Punitive Damages Against Corporations in Environmental and Safety Torts*, 87 GEO. L.J. 285 (1998).

A second test is more limited. Suppose one does not accept economic efficiency as the goal of punitive damages. Nevertheless, firms should be punished less for greater efforts to promote safety. The more a firm invests in safety, the more unlikely it is that the firm should be judged reckless for displaying a conscious disregard for safety. Holding constant other aspects of the firm's behavior, as the level of investment in safety increases, the frequency and level of punitive damages should fall.

The third and final test is still more limited. Do jurors properly implement formal instructions when setting punitive damages levels? Wholly apart from broader law and economics norms, do jurors adhere to specific instructions from the judge telling them how to make efficient awards?[2]

Unfortunately, jury damages awards tend to discourage safe corporate behavior by punishing careful decision-making, even when jurors have been explicitly instructed to act efficiently. This Article examines two efforts directed at improving jury performance in balancing risk and cost and in adhering to jury instructions. The first set of results pertains to jury judgments of recklessness when a defendant company performed a risk-cost analysis.[3] Mock jurors considered case scenarios and were asked to assess whether the company's behavior was reckless and warranted punitive damages. Ideally, companies should undertake systematic risk analyses to achieve the appropriate balance of risk and cost in their decision-making.[4] In fact, corporate risk analyses have been associated with many of the most prominent punitive damages awards, particularly with respect to the automobile industry.[5] This suggests that jurors interpret risk-cost analyses as worthy of punishment rather than as praiseworthy efforts to improve safety. Part III of this Article explores how different case contexts affect the likelihood and level of punitive damages. Building on results from an earlier series of experiments, I found that jurors fail to make efficient punitive damages awards and are vulnerable to dollar values that are suggested as anchor values at trial.[6]

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[2] Whether punitive damages should be set by a judge or eliminated for many classes of cases involves judgments beyond the scope of this paper.

[3] In the usual policy analysis case, there is a benefit-cost comparison. Preventive steps are taken if the value of the benefit exceeds the costs of attaining that benefit. For policy choices involving risk, the benefit is risk reduction, leading to a tradeoff between risk reduction and cost, or a risk-cost tradeoff.

[4] The approach I take here is the standard policy analysis perspective. *See* W. KIP VISCUSI, FATAL TRADEOFFS: PUBLIC & PRIVATE RESPONSIBILITIES FOR RISK 4–6 (1992) [hereinafter VISCUSI, FATAL TRADEOFFS]. Judge Frank Easterbrook describes the desirability of corporations using their expertise to make safety decisions in *Carroll v. Otis Elevator Co.*, 896 F.2d 210, 215 (7th Cir. 1990).

[5] *See, e.g.*, Jimenez v. Chrysler Corp., 74 F. Supp. 2d 548 (D.S.C. 1999), *vacated by* 2001 U.S. App. LEXIS 22562 (5th Cir. Oct. 19, 2001); General Motors Corp. v. Moseley, 447 S.E.2d 302, 311 (Ga. Ct. App. 1994).

[6] The results of the initial series of experiments were published in W. Kip Viscusi, *Corporate Risk Analysis: A Reckless Act?*, 52 STAN. L. REV. 547, 553 (2000) [hereinafter Viscusi, *Corporate Risk Analysis*]. Additional analysis of the results may be found in *Ju-*

Part IV presents the results of a study on the effectiveness of jury instructions developed by Polinsky and Shavell in an effort to ground the determination of punitive damages in sound law and economics principles.[7] Typical punitive damages instructions ask jurors to determine whether the defendant's conduct was reckless, i.e., whether the defendant was conscious of grave danger, whether that risk eventuated, whether the defendant disregarded the risk, and whether the defendant's conduct was a gross deviation from the level of care an ordinary person would select.[8] If these criteria are met, the jury may award punitive damages to punish and deter the defendant. Armed with the Polinsky-Shavell instructions, however, the determination of punitive damages should be a straightforward mathematical exercise involving little more than simple multiplication and addition.[9] By reducing the task of setting punitive damages to the implementation of a formula, the Polinsky-Shavell approach ideally should eliminate the random element of punitive damages and ground them in important principles of efficiency.[10] In practice, the instructions do not appear to improve the efficiency of damages awards.

My assessment of juror reactions to corporate risk analyses and to the Polinsky-Shavell punitive damages instructions was based on controlled experimental results involving hundreds of jury-eligible citizens. The experimental findings do not bode well for the possibility of remedying perceived inadequacies in jury performance. Jurors do not seem receptive to risk-cost balancing and also fail to implement the guidance offered by the Polinsky-Shavell formulas. Jurors are vulnerable to suggestions made at trial regarding appropriate awards, even when they have been directed to use a different method for determining damages. Furthermore, the damages awards made in the studies penalized companies that made efficient decisions about risk. It appears that instead of deterring risky conduct, damages often discourage companies from taking efficient steps to make their operations safer.

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*rors, Judges, and the Mistreatment of Risk by the Courts*, 30 J. LEGAL STUD. 107, 119–27 (2001) [hereinafter Viscusi, *Jurors*].

[7] *See* A. Mitchell Polinsky & Steven Shavell, *Punitive Damages: An Economic Analysis*, 111 HARV. L. REV. 869, 957–62 (1998). Results from this study also are analyzed in W. Kip Viscusi, *The Challenge of Punitive Damages Mathematics*, 30 J. LEGAL STUD. 313 (2001) [hereinafter Viscusi, *Challenge of Punitive Damages*]

[8] *See* Jardel Co., Inc. v. Hughes, 523 A.2d 518, 527–31 (Del. 1987).

[9] See Polinsky & Shavell, *supra* note 7, at 960–62 for their formula for setting punitive damages for firms.

[10] While Polinsky and Shavell stress the importance of the formula in providing "guidance" to jurors with respect to punitive damages levels, as a practical matter the variability of awards should be reduced as well. *See id.* at 954–56. For example, the calculation of the deterrence value of punitive damages has only one correct answer for any particular case. If jurors follow the formula, then their damages awards should not vary from this figure. *See id.* at 960–61.

## II. THE PRACTICAL CONSEQUENCES OF CORPORATE RISK ANALYSES[11]

In order for businesses to make efficient decisions about safety, risk-cost balancing must be an explicit concern of corporate risk decision-making. Such balancing lies at the heart of standard negligence tests, particularly those that are framed within the context of a law and economics approach, such as the Learned Hand rule.[12] Risk-cost tradeoffs are central to the commonly used risk-utility test for assessing liability, which balances a product's usefulness and safety characteristics to determine whether the company has attained the correct balance of cost and risk.[13]

Similarly, risk-cost tradeoffs play a central role in government regulatory policy in the risk and environmental area, because a regulation's stringency is reflected in the cost expended by regulated companies per life saved.[14] For any given regulatory policy, it is usually the case that the costs of the regulation become increasingly greater as the regulation is tightened.[15] These tradeoffs are incurred as the government seeks to induce regulated industries to achieve desired levels of safety.[16] It should be noted, however, that the decision-making processes of regulators and juries are not identical. The government sets regulatory levels and businesses set care levels in anticipation of a certain number of future accidents. At the time the lifesaving decisions are made, the potential victims who would be the beneficiaries of additional safety precautions generally are not known. In contrast, juries consider accident cases in which there is an identified victim. Jurors may find it difficult to evaluate the business's conduct from an *ex ante* perspective once there is a specific, human victim in addition to a statistical probability of harm.[17]

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[11] The discussion in Part II draws extensively on Viscusi, *Corporate Risk Analysis*, *supra* note 6, at 548–52, 567–78. For additional analysis, see Viscusi, *Jurors*, *supra* note 6, at 117–18.

[12] *See* A. MITCHELL POLINSKY, AN INTRODUCTION TO LAW AND ECONOMICS 41–42 (2d ed. 1989); RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 179–83 (5th ed. 1998). The Learned Hand formula parallels the risk-cost tradeoff in cost-benefit analysis. A firm is negligent if the cost of the precaution is less than the probability of an accident multiplied by the size of the loss incurred when the accident does occur. *See* POSNER at 180.

[13] *See* John W. Wade, *On the Nature of Strict Tort Liability for Products*, 44 MISS. L.J. 825, 837–38 (1973); W. KIP VISCUSI, REFORMING PRODUCTS LIABILITY 70–81 (1991). I discuss this issue in greater detail in Viscusi, *Corporate Risk Analysis*, *supra* note 6, at 549.

[14] *See* VISCUSI, FATAL TRADEOFFS, *supra* note 4, at 4–6.

[15] *See* W. KIP VISCUSI, RISK BY CHOICE: REGULATING HEALTH AND SAFETY IN THE WORKPLACE 114–15 (1983). Justice Breyer refers to the escalation of costs as regulations are tightened as "the problem of the last 10 percent." In other words, such stringent regulations impose "high costs without achieving additional safety benefits." *See* STEPHEN BREYER, BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE RISK REGULATION 10–19 (1993).

[16] *See* BREYER, *supra* note 15, at 9–10. For a more detailed discussion, see Viscusi, *Corporate Risk Analysis*, *supra* note 6, at 561–62.

[17] *See* Carroll v. Otis Elevator Co., 896 F.2d 210, 215–16 (7th Cir. 1990).

Because of the central role played by risk-cost tradeoffs in attaining desired levels of care, a recent preliminary draft of the Restatement (Third) of Torts explicitly recognized the importance of undertaking such an analysis as well as the fact that doing an analysis in and of itself should not be a basis for finding negligence:

> Under § 4, negligence is defined in terms of the failure to exercise reasonable care, and reasonable care is explained primarily in terms of the balance between the magnitude of the foreseeable risk and the burden of precautions that can eliminate the risk. If the burden is greater than the risk, the actor who declines to adopt that precaution is not negligent. But if the magnitude of the risk is somewhat greater than the burden, the actor is negligent for failing to adopt the precaution.
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> From this evaluation, two points follow that relate to the meaning of recklessness. The first point is a negative one: the fact that the actor, because of the burden entailed by a particular precaution, has made a deliberate choice to omit a precaution and hence to tolerate a risk by no means signifies that the person has behaved recklessly. Indeed, the fact that such a choice has been made does not even show that the actor has behaved negligently. Rather, the actor is negligent only for making an unwise choice. In a sense, the very objective of negligence law is to encourage actors to acknowledge and confront such choices, and to render these choices wisely rather than unwisely.[18]

The practical experience with corporate risk analysis has not followed the Restatement guidelines, and plaintiffs often use the fact that the defendant conducted a risk analysis to infer that behavior was negligent or reckless. Indeed, as the discussion below explains, the analysis in and of itself can become a source of controversy and lead jurors to impose punitive sanctions on the company.[19]

In some cases, these corporate risk analyses occur after the fact, as the company attempts to determine the causes of a major accident. After airplane crashes, for example, companies should make a frank and critical assessment of the causes so as to prevent such accidents in the future.[20] Because jurors respond to these analyses by awarding higher dam-

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[18] RESTATEMENT (THIRD) OF TORTS § 2, cmt. d (Discussion Draft 1999).

[19] Perhaps the most noteworthy instance was a General Motors case involving burn victims in a rear-ended Chevrolet Malibu, which will be discussed in detail below. *See infra* notes 31–36 and accompanying text.

[20] For a discussion of the tensions involved with post-crash investigations, see Donald S. Skupsky, *Legal Requirements for Records Prepared for Internal Investigations and Audits*, REC. MGMT. Q., Apr. 1992, at 34–36. I discuss the same issue in greater detail in Viscusi, *Corporate Risk Analysis*, *supra* note 6, at 567–68.

ages, an investigation may jeopardize the company's prospects in court when the families of the accident victims seek compensation.[21] Defendants also may be concerned that a truly critical report could trigger punitive damages.[22] As a result, the frankness and thoroughness of the report could be compromised if the company were forced to release its own assessment of the accident.

Risk analysis following airline crashes was a central issue in the legal battle involving the 1979 American Airlines DC-10 crash near O'Hare Airport.[23] American Airlines had undertaken a detailed post-crash investigation, but later destroyed the report, claiming that it was covered by attorney-client privilege.[24] The court suggested that the failure to release the report did not necessarily imply that the report itself would have been damaging.[25] Nonetheless, one can speculate that American Airlines' decision to destroy the report may have been influenced by fear that jurors would view the analysis in a negative light.

An airline must make a difficult decision after a plane crash.[26] If it chooses not to undertake an accident investigation, surely that would be a sign of recklessness. The accident gave the company knowledge of a risk, and the company has a duty to investigate and determine how to reduce that risk in the future.[27] Undertaking some kind of post-accident assessment certainly would appear to be the more desirable course for preventing future harm.[28] Nonetheless, when the company realizes the punitive damages consequences of making such an analysis, it may choose to either forgo a thorough investigation or keep any resulting report secret.

In situations in which the corporate risk analysis occurs before the accident, the very act of undertaking the analysis often becomes a negative feature rather than a positive one in jury determinations of punitive damages.[29] Suppose the company makes a detailed risk assessment and then proceeds with a level of safety that is efficient, but that does not result in zero risk. Jurors often view the risk analysis as a negative aspect of corporate behavior, reasoning that the company knew of a way to make the product safer, but chose instead to endanger its customers.[30]

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[21] *See* Skupsky, *supra* note 20, at 34–36.

[22] *See id.*

[23] *See In re* Air Crash Disaster near Chicago, Illinois on May 25, 1979, 90 F.R.D. 613 (N.D. Ill. 1981).

[24] *See id.*

[25] *See id.* at 621.

[26] This discussion draws extensively on Viscusi, *Corporate Risk Analysis*, *supra* note 6, at 567.

[27] *See id.* Following any accident, one can analyze whether human or mechanical failure were contributory factors and whether changes in either would have affected the likelihood of an accident.

[28] *See* Skupsky, *supra* note 20, at 34.

[29] The cases discussed below will document this relationship. See *infra* notes 31–41 and accompanying text.

[30] *Id.*

A noteworthy case was that brought against General Motors ("G.M.") in Los Angeles, in which a Chevrolet Malibu was rear-ended on Christmas Eve, 1993. The driver, her four children, and a friend of the family were riding in the car, and all were seriously burned as a result of the accident.[31] During the trial, a memo by G.M. engineer Edward Ivey played a critical role leading to the $4.8 billion punitive damages award.[32] That memo analyzed the costs of fuel-fed, fire-related fatalities in cars and the costs of preventing these deaths.[33] Ivey valued fatalities at $200,000 each, which is the same value that Ford used in its analysis of risks associated with the Ford Pinto.[34] The Pinto analysis had used a number that paralleled the level of compensatory damages awards in fatality cases, which can be traced to the present value of lost earnings due to the accident.[35] This value was consistent with punitive damages awards in product-related fatality cases during that time period.[36]

Whether such an amount would be an appropriate yardstick to use when valuing life from the standpoint of preventing deaths in automobile crashes is more problematic. Two factors should be considered: the value from the standpoint of prevention, and the value from the standpoint of compensation.[37] In terms of preventing accidents, the appropriate economic measure is the value of a statistical life, or the risk-money tradeoff involving small risks.[38] For compensation purposes, looking at the income loss may be a reasonable measure of damages, but it will understate how much it is worth to prevent the death. People value their lives at more than their income level and they generally are not willing to accept certain death in return for compensation for future income loss.[39] Ivey's memo did not pursue these issues, but did conclude on a cautionary note:

> This analysis indicates that for G.M. it would be worth approximately $2.20 per new model auto to prevent a fuel fed fire

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[31] For a description of this case, see Andrew Pollack, *Paper Trail Haunts GM After it Loses Injury Suit: An Old Memo Hinted at the Price of Safety*, N.Y. TIMES, July 12, 1999, at A12; Andrew Pollack, *$4.9 Billion Jury Verdict in GM Fuel Tank Case: Penalty Highlights Cracks in Legal System*, N.Y. TIMES, July 10, 1999, at A8 [hereinafter Pollack, *Jury Verdict*]; Ann W. O'Neill et al., *GM Ordered to Pay $4.9 Billion in Crash Verdict Liability*, L.A. TIMES, July 10, 1999, at A1.

[32] See Pollack, *Jury Verdict*, *supra* note 31, at A8.

[33] Memorandum from E. C. Ivey, to General Motors, Value Analysis of Auto Fuel Fed Fire Related Fatalities (June 29, 1973). Also see my earlier discussion of the Ivey memorandum in Viscusi, *Corporate Risk Analysis*, *supra* note 6, at 574–76.

[34] *See* VISCUSI, REFORMING PRODUCTS LIABILITY, *supra* note 13, at 111. For further discussion of the Pinto case, see *infra* notes 44–51 and accompanying text.

[35] *See* VISCUSI, REFORMING PRODUCTS LIABILITY, *supra* note 13, at 111.

[36] *See id.*

[37] *See* W. Kip Viscusi, *Misuses and Proper Uses of Hedonic Values of Life*, 13(2) J. FORENSIC ECON. 111 (2000) [hereinafter Viscusi, *Misuses*].

[38] *See id.* at 112.

[39] *See* Viscusi, FATAL TRADEOFFS, *supra* note 4, at 39–40.

> in *all* accidents .... This analysis must be tempered with two thoughts. First, it is really impossible to put a value on human life. This analysis tried to do so in an objective manner but a human fatality is really beyond value, subjectively. Secondly, it is impossible to design an automobile where fuel fed fires can be prevented in all accidents unless the automobile has a non-flammable fuel.[40]

Was undertaking such an engineering analysis viewed as an honest attempt at risk-cost balancing? The attorney representing the plaintiffs argued just the opposite, claiming that this analysis showed that G.M. was "caught red-handed."[41] The company was aware of the risk and the potential for reducing it, yet proceeded with the original design. After the trial, one of the lawyers for the plaintiff observed that the large punitive damages award was, in effect, a critique of this approach to examining risk-cost tradeoffs: "The jurors wanted to send a message to General Motors that human life is more important than profits."[42] Jurors likewise highlighted the corporate risk analysis as significant in the decision-making process: "Jurors told reporters that they felt the company had valued life too lightly. 'We're just like numbers I feel, to them,' one juror, Carl Vangelisti, told Reuters. 'Statistics. That's something that is wrong.'"[43] These comments suggest that the large award reflected the jurors' belief that the very act of performing a risk-cost analysis merited punitive damages.

There are several ways for jurors to infer from a risk-cost analysis that punitive damages should be awarded. By conducting an analysis, the company demonstrates awareness of the risk. If it chooses not to adopt the safety measure, it will have demonstrated willingness to proceed with a design knowing that it would cost lives. The very act of undertaking an analysis may appear cold-hearted, and making an explicit tradeoff of lives for money may appear to be a gross deviation from proper care. At the time of the analysis, the tradeoff is between expensive across-the-board safety measures and a small expected loss to any particular individual. After an accident, the comparison is between a modest safety investment that would have prevented the specific fatality and an identifiable life, a trade-off that jurors may find reckless.

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[40] Ivey, *supra* note 33 (emphasis added). Ivey's suggestion that it is impossible to obtain zero risk may run counter to jurors' intuition. From an efficiency perspective, however, the relevant issue is not whether the risk of the current design is greater than zero, but whether the risk of the current design is desirable when compared against the costs of risk reduction.

[41] *Jury Awards $4.9 Billion to Crash Victims, Finds GM Bargained Away Passenger Safety*, PROD. SAFETY & LIAB. REP., July 16, 1999, at 721.

[42] Pollack, *Jury Verdict*, *supra* note 31, at A8.

[43] *Id.*

In many respects, the experience with the Ivey analysis paralleled the earlier press treatment of the Ford analysis relating to the Pinto.[44] *Grimshaw v. Ford Motor Company*[45] focused on the safety aspects of the design of the Pinto and, in particular, the placement of the gas tank in the rear of the vehicle.[46] What was particularly noteworthy about *Grimshaw*, which led to a $125 million punitive damages award that was subsequently reduced to $3.5 million, was the role of corporate risk analysis in the media coverage of the case.[47] *Mother Jones* magazine published an article documenting that a Ford engineer had done a safety analysis on the Pinto assessing the benefits and costs of preventing fire-related deaths.[48] This article was released at a press conference featuring Ralph Nader and led to the awarding of a Pulitzer Prize to the magazine.[49] Ford's analysis was construed by *Mother Jones* as pertaining to the Pinto rear impact risks.[50] Although Ford was criticized for having analyzed the risks associated with rear-end impact fires, the document at issue was in fact an economic analysis prepared for the National Highway Traffic Safety Administration in opposition to a proposed regulation regarding fires associated with rollover risks.[51]

Similar issues arose with respect to the Chrysler minivan case, in which a six year-old, Sergio Jimenez, was thrown from the vehicle after his mother ran a red light and the minivan was struck on its side.[52] This case, which led to a $250 million punitive damages award against the Chrysler Corporation, was noteworthy in that the company had undertaken a post-accident analysis of the cost of fixing the allegedly defective rear-door latch that opened when the minivan rolled over after being hit

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[44] *See* Mark Dowie, *Pinto Madness*, MOTHER JONES, Sept.-Oct. 1977, at 18.

[45] 174 Cal. Rptr. 348 (Cal. Ct. App. 1981).

[46] This case also receives extensive analysis in Viscusi, *Corporate Risk Analysis*, *supra* note 6, at 568–70.

[47] *See* Gary T. Schwartz, *The Myth of the Ford Pinto Case*, 43 RUTGERS L. REV. 1013, 1020–21 (1991).

[48] *See* Dowie, *supra* note 44, at 18.

[49] *See* STUART M. SPEISER, LAWSUIT 357 (1980).

[50] *See* Dowie, *supra* note 44, at 24.

[51] *See* Schwartz, *supra* note 47, at 1020–21 & n.21. This mismatch between the *Mother Jones* report and *Grimshaw* is a central theme in Schwartz's article. *See also* BRENT FISSE & JOHN BRAITHWAITE, THE IMPACT OF PUBLICITY ON CORPORATE OFFENDERS 54 (1983), observing:

> In the absence of an offense defined in terms of manufacturing an unjustifiably dangerous product, questions of acceptable risk of the kind raised by the Pinto Papers will rarely be the central subject of inquiry in the context of corporate offenses against the person. This is unsatisfactory, not only because of the danger of a serious underlying risk being concealed from society, but also because it may do more harm than good not to face up to the need for studies of the costs of improving product safety in matters such as that for which Ford was pilloried.

[52] *See* Jimenez v. Chrysler Corp., 74 F. Supp. 2d 548 (D.S.C. 1999), *vacated by* 2001 U.S. App. LEXIS 22562 (5th Cir. Oct. 19, 2001). *See also* Viscusi, *Corporate Risk Analysis*, *supra* note 6, at 551.

on the side.[53] The analysis concluded that the design did not pose a significant risk and that it would have cost $100,000 in fixed retooling costs as well as an additional $0.50 per vehicle to change the latch design.[54] After the trial, the plaintiff's attorney observed that "Chrysler officials at the highest level cold-bloodedly calculated that acknowledging the problem and fixing it would be more expensive, in terms of bad publicity and lost sales, than concealing the defect and litigating the wrongful death suits that inevitably would result."[55]

The 1984 case of *Ford Motor Co. v. Stubblefield*[56] involved a Ford Mustang II that caught fire after a rear impact.[57] The fire killed Terri Stubblefield, the passenger riding in the rear seat of the car. The jury awarded $8 million in punitive damages. The plaintiff's argument referred to a risk analysis undertaken by Ford and criticized the company for engaging in "safety science management":[58]

> The evidence here was sufficient to authorize the jury to find that the sum of $8 million was an amount necessary to deter Ford from repeating its conduct; that is, its conscious decision to defer implementation of safety devices in order to protect its profits. One internal memo estimated that "the total financial effect of the Fuel System Integrity program [would] reduce Company profits over the 1973–1976 cycle by $(109) million," and recommended that Ford "defer adoption of the [safety measures] on all affected cars until 1976 to realize a design cost savings of $20.9 million compared to 1974." Another Ford document referred to a $2 million cost differential as "marginal."[59]

The difficulties encountered by Ford with respect to its engineering risk analyses have not been limited to rear impact cases. In *Miles v. Ford Motor Co.*,[60] the company came under fire for its risk analysis done with respect to tension eliminator spools for lap belts.[61] In this particular case, the passenger, Willie Miles, leaned over to pick up some trash from the floor of the car, causing the shoulder harness to spool out and leaving a

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[53] *See* Jimenez, 74 F. Supp. 2d at 560.

[54] *See* Donald C. Dilworth, *Jurors Punish Chrysler for Hiding Deadly Defect*, TRIAL, Feb. 1998, at 14, 16.

[55] *Id.* at 14.

[56] 319 S.E.2d 470 (Ga. Ct. App. 1984).

[57] For additional analysis of this case, see Viscusi, *Corporate Risk Analysis*, *supra* note 6, at 572–73.

[58] 319 S.E.2d at 475.

[59] *Id.* at 481.

[60] 922 S.W.2d 572 (Tex. App. 1996), *remanded for procedural errors to* Ford Motor Co. v. Miles, 967 S.W.2d 377 (Tex. 1998).

[61] This case also is discussed in Viscusi, *Corporate Risk Analysis*, *supra* note 6, at 572–73.

slack.[62] The tension eliminator spool did not rewind the belt.[63] The car was involved in a collision, and Miles slid through his lapbelt, catching his head and sustaining spinal injuries.[64]

Once again, the fact that Ford had conducted an analysis of this class of issues proved to be consequential in the arguments at trial.[65] Indeed, not only had Ford explored the issue, but it had undertaken an economic cost-benefit analysis.[66] Although such an analysis is necessary to achieve an efficient result, Ford's caution was presented in a negative light in court:

> Syson [the plaintiff's accident reconstruction expert] testified that he was familiar, during the relevant time period, with the corporate policies of Ford Motor Company as they related to potentially defective products. Syson testified that when Ford identified what it believed was a defective product it would first run a "cost benefit" analysis to see what the cost would be to fix or repair the defect. Next, Ford would assign arbitrary values to each death or serious injury and would predict the number of occurrences which would involve either death or serious injury. Finally, Ford would determine the cost to litigate such deaths and injuries. Syson testified that if the cost to repair the defect exceeded the other costs, Ford would not correct the defect.[67]

As described here, the procedure undertaken by Ford has all the earmarks of a standard economic analysis. In particular, the decision came down to an explicit comparison of the benefits of risk reduction and costs.[68] The task from a cost-benefit standpoint is to assess the cost of the safety improvement and to compare these costs to the benefits.[69] The benefits equal the expected number of injuries or deaths, multiplied by a dollar valuation of the adverse health outcomes. This also is the approach taken in the Learned Hand negligence formula. Although there can be disagreement regarding the dollar values attached to the benefit levels, the overall steps in the analysis are not controversial and follow standard economic blueprints for risk analysis. The valuation amounts are not, however, ideal, and I will examine their influence in the empirical study.

These examples illustrate my hypothesis that as a practical matter, once the accident has taken place, the jury may compare the small costs

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[62] 922 S.W.2d at 579.
[63] *Id.*
[64] *Id.*
[65] *Id.* at 588–89.
[66] *Id.*
[67] *Id.*
[68] For an overview of how economists conduct cost-benefit analyses, see EDITH STOKEY & RICHARD ZECKHAUSER, A PRIMER FOR POLICY ANALYSIS 134–58 (1978).
[69] *Id.*; *see also* VISCUSI, FATAL TRADEOFFS, *supra* note 4, at 4–6.

associated with fixing an automobile with the catastrophic injury to the victim and find that they are not commensurable. The difficulty is that jurors are often unable to conceive of the pre-accident situation, where the tradeoff is not between the small cost of a design change to one vehicle and an identified life, but rather between costs of the design change across an entire model and a statistical expectation of possible fatalities that is based on engineering models rather than concrete evidence. The failure of jurors to view the accident from the situation of the company beforehand is a reflection of the more general phenomenon of hindsight bias. In effect, jurors may use the information conveyed by an accident in judging behavior as if they knew all along that a particular activity was risky, even though this had not been evident before the accident occurred.[70]

The issue that I will examine below using experimental evidence is whether risk analyses can be presented to jurors in a way that will make them better understand the importance of risk-cost tradeoffs. In doing so, I will examine not only different kinds of analyses the company might undertake but also different ways in which these analyses might be positioned within the context of litigation. Do jurors respond to the economic soundness of the analysis? Do they respond to the contextual setting of the analysis?

## III. Experimental Results on Corporate Risk Analysis

To better understand how jurors respond to risk analysis evidence, I undertook a series of experiments involving jury-eligible citizens. Subjects for these experiments were recruited by a survey research firm. The test site used was Phoenix, Arizona for the first five scenarios considered.[71] I also examine additional, new results based on a sample from Austin, Texas.[72] In each instance, the samples were broadly representative of the adult population and were similar in terms of attributes such as educational background. Because the scenarios presented were identical except for the controlled manipulations, one would not expect different results because of the difference in locales.

The study participants were divided into different groups, each of which considered one case scenario involving an automobile accident. The scenarios differed in terms of whether the company performed an

[70] *See, e.g.*, Reid Hastie et al., *Juror Judgments in Civil Cases: Hindsight Effects on Judgments of Liability for Punitive Damages*, 23 Law & Hum. Behav. 597 (1999).

[71] The results for Scenarios 1 through 5 are discussed in Viscusi, *Corporate Risk Analysis*, *supra* note 6, at 552–559. Additional statistical analysis appears in Viscusi, *Jurors*, *supra* note 6, at 115–27.

[72] The reason two survey waves were run was that the initial survey results indicated widespread resistance to corporate risk analysis. The sequel was intended to explore whether such biases could be reduced.

analysis, the character of the analysis, and other analysis-related aspects of the case. By making comparisons across different subject groups that considered different scenarios, it was possible to see whether juror acceptance of risk-cost studies could be increased by changing the character of the analysis or pertinent facts of the case. Other aspects of the scenarios were held constant in order to isolate the effects of these influences.

The basic case scenario, Scenario 1, involved an automobile company that manufactured cars. The defective vehicles resulted in a number of burn deaths:[73]

> A major auto company with annual profits of $7 billion made a line of cars with a defective electrical system design. This failure has led to a series of fires in these vehicles that caused 4 burn deaths per year. Changing the design to prevent these deaths would cost $16 million for the 40,000 vehicles affected per year. This safety design change would raise the price of cars $400 each. The company thought that there might be some risk from the current design, but did not believe that it would be significant. The company notes that even with these injuries, the vehicle had one of the best safety records in its class.
>
> The courts have awarded each of the victims' families $800,000 in damages to compensate them for the income loss and pain and suffering that resulted. After these lawsuits, the company altered future designs to eliminate the problem.

Thus in Scenario 1, the company did not conduct a risk-cost analysis. In Scenario 2, the company also failed to perform an analysis, but the cost per life saved was only $1 million. This information can be found in Table 1, which summarizes the seven different scenarios. In Scenario 2, the company could have prevented the deaths at a cost of $1 million each. The other scenarios had the higher cost per life saved of $4 million. At this higher cost, it becomes more difficult for the company to prevent the burn deaths. As a consequence, juries that are trying to attain an efficient result should be less likely to find fault with the company's safety decision.

Unlike Scenarios 1 and 2, Scenarios 3 through 7 all involved the company undertaking a risk analysis that compared the benefits and costs

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[73] Some scenarios were run with a different number of deaths, but responses were not sensitive to this manipulation. The total lives lost took on values of 4 and 10. Apparently, this range of the number of deaths was not sufficiently great to affect respondents' assessments given the other aspects of the scenario. There were no statistically significant differences in the responses to the scenarios when the number of deaths was 10 rather than 4.

of the safety improvement. The risk analysis for Scenario 3 used the value of compensatory awards as the reference point:

> The company did a detailed analysis of the risk and estimated that 4 people would die each year. However, the company estimated that the liability cost would only be $800,000 per death based on the median award all industries pay for product-related fatalities. The company's estimate of the total court awards for the design problem was $3.2 million per year. As a result, the company estimated that the $4 million annual cost of making the change exceeded the estimated value of the court awards. The company concluded that it was cheaper not to adopt the safer design. The company notes that even with these injuries, the vehicle had one of the best safety records in its class.

For Scenario 4, the basis for valuing expected lives lost was the value of a statistical life used by the government:

> The company did a detailed analysis of the risk and estimated that 4 people would die on average per year. However, the cost to eliminate the risk was $4 million per fatality prevented. To determine whether the safety improvement was worthwhile, the company used a value of $3 million per accidental death, which is the value used by the National Highway Traffic Safety Administration in setting auto safety standards. The company estimated that the annual safety benefits of the safer design would be $12 million (4 expected deaths at $3 million per death), while the costs would be $16 million. As a result, the company believed that other safety improvements might save more lives at less cost. The company notes that even with these injuries, the vehicle had one of the best safety records in its class.

In each instance, the company presented with these figures realized that the costs exceeded the benefits, and as a consequence, chose not to make the safety improvement.

The risk-cost analysis in Scenario 3 valued the benefits of saving lives in the same manner as the various analyses undertaken by Ford and General Motors.[74] It used the value of compensatory damages for fatalities, which was set at $800,000. This particular figure was selected as a measure of the present value of the decedent's lost earnings, less the decedent's consumption share, plus compensation for pain and suffering.[75]

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[74] *See supra* notes 31–36, 44–51 and accompanying text.

[75] For example, if wage growth is at the rate of interest, then a person earning $40,000 per year for an additional twenty years would earn a total of $800,000. If pain and suffer-

The company found that the added safety costs of $4 million per life exceeded these expected court awards. As a consequence, the company chose not to make the safety investment.

Using the value of court awards as a proxy for the benefits from lives saved has superficial appeal, particularly if one's focus is solely on the expected consequences in the judicial system. In particular, if past judicial outcomes provide a reliable measure of other companies' prospects in court, then a company assessing the prospective legal costs of dangerous products could use this value as a cost measure. It should be kept in mind, however, that this index ignores whatever value consumers attach to avoiding risks even if they expect that a well-functioning legal system will compensate them fully for their losses. In addition, the value of the compensatory award based on income loss alone surely will not compensate for non-pecuniary losses due to death or serious disability, because people value their own lives by more than the value of their income.[76]

Furthermore, the compensatory amount does not reflect the full value that potential victims place on preventing risks to life.[77] The court awards reflect compensation for the family of the deceased that is intended to meet some of the income losses resulting from the death.[78] From the standpoint of proper design of automobiles, the appropriate question is not what the company must pay out to compensate the survivors, but rather how valuable it is to the prospective accident victims to reduce the risks of death to themselves.[79] In particular, what is their willingness to pay for reduced risk, where this translates into a value of a statistical life that is generally substantially greater than the present value of lost earnings? For example, if people are willing to pay $300 to avoid a risk of 1/10,000, the value of the statistical life is $3 million, even though compensatory damages to a particular victim likely would fall below this figure.

To capture the higher, willing-to-pay value, the risk analysis in Scenario 4 used a $3 million value of life rather than the $800,000 value in Scenario 3. The $3 million figure was comparable to the highest values

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ing compensation equals the deduction for the decedent's consumption, then the total compensatory award would be $800,000.

[76] *See surpa* note 39 and accompanying text.

[77] The discussion below draws on VISCUSI, FATAL TRADEOFFS, *supra* note 4, at 17–23, and VISCUSI, RATIONAL RISK POLICY 45–68 (1998).

[78] *See* Viscusi, *Misuses, supra* note 37, at 116–17.

[79] This willingness-to-pay principle is a basic component of benefit-cost frameworks. *See* Stokey & Zeckhauser, *supra* note 68. Indeed, the United States Office of Management and Budget recommends this approach for regulations throughout the federal government. *See* U.S. OFFICE OF MANAGEMENT AND BUDGET, REGULATORY PROGRAM OF THE UNITED STATES GOVERNMENT, APR. 1, 1992–MAR. 31, 1993 634 (1992). The Bush administration indicated that the same guidelines that were pertinent from 1992 through 1993 (Exec. Order No. 12,866, 50 Fed. Reg. 51735 (Oct. 4, 1993)) would be implemented under the current administration. *See* Memorandum from John D. Graham, to the President's Management Council, Presidential Review of Agency Rulemaking by OIRA (Sept. 20, 2001).

used by the United States Department of Transportation.[80] Moreover, the scenario stated that in adopting this value and in carrying out the analysis, the company followed the same procedure used by the United States government when setting automobile safety regulations. In this instance, the benefit value for saving lives was $3 million per life, and the cost per expected life saved was $4 million, so that on an efficiency basis it still was not worthwhile to adopt the safety improvement.[81] Because the company concluded that the annual benefits of $30 million would be less than the annual costs of $40 million, it chose not to make the safety improvement.

The next series of scenarios focused on how the company used the analysis. Scenarios 5 through 7 involved situations in which the company conducted the risk analysis as in Scenario 4, and the costs and benefits were the same as in Scenario 4. In Scenario 5, the company made a miscalculation and failed to realize that the benefits of risk reduction exceeded the costs.

> The company estimated that the safety benefits of the safer design would be $6 million (2 expected deaths at $3 million per death), while the costs would be $8 million. As a result, the company did not adopt a safer design since it believed that other safety improvements might save more lives at less cost. If, however, the company had assessed the risk accurately, the benefits of the safer design would have been $12 million, which exceeds the costs of the design change. The company notes that even with these injuries, the vehicle had one of the best safety records in its class.

If the company had not made this error, it would have fixed the car design defect because it would have realized that this was the efficient course of action. In Scenario 5, the company erred in concluding that improvements in safety were not warranted, whereas in Scenario 4 the company correctly concluded that the changes were not warranted on an efficiency basis.

Scenario 6 focused on the degree to which the company actually used the analysis in designing the automobile. In this scenario, the analysis was undertaken by a staff engineer, but the company claimed that the analysis did not play any role in the design of the car.

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[80] *See* Matthew D. Adler & Eric A. Posner, *Implementing Cost-Benefit Analysis When Preferences Are Distorted*, 29 J. L. STUDIES 1105 app. at 1146 (2000).

[81] The point of view I advocate is that prospective lives saved should be given the value of a statistical life derived from people's willingness to pay for risk reduction. Thus, it is the values determined by the beneficiaries of the government policy that should count.

> The study indicated that other safety improvements might save more lives at less cost. The company said it never used the study in the design of the vehicle. It was an analysis by a staff engineer that did not play any role in the design decision.

This could occur in a large enterprise if the analyst was working in a division not responsible for the automobile design, or if the analysis appeared in a memorandum by a low-level employee that simply never made it to the corporate decision-makers. The question posed by this scenario was whether the fact that the analysis took place at all would influence juror behavior, as opposed to the situation where the company actually incorporated the analysis in its decision-making process. It should be noted that even if jurors are told that the company did not use the analysis in designing the car, they may not find this claim credible. Jurors might hypothesize that the company is attempting to minimize the role of the analysis for fear that jurors might penalize the company if they knew that it had based its decision to forego the safety improvement on risk-cost tradeoff considerations.

In an actual case situation, one would expect the company to mount an aggressive defense explaining why it conducted the analysis.[82] Scenario 7 examined whether the company could deflect some of the criticism of risk analyses by emphasizing the constructive role that such studies play. In Scenario 7, the respondents were told that the company had undertaken other such risk analyses in the past. These analyses had led to many major safety improvements in cars, but this particular modification did not pass muster on a risk-cost basis.

> The company had undertaken a series of similar risk analyses for other safety measures. These studies led to improved structural reinforcements in the doors, stability controls, and other improvements. But in this instance the company concluded that the extra costs to consumers were too great in comparison to the safety benefits. The company chose instead to make other design changes that might save more lives at less cost. The company notes that even with these injuries, the vehicle had one of the best safety records in its class.

The issue to be explored in this scenario was whether detailed articulation of the rationale underlying corporate risk analysis could reduce juror resistance to accepting the approach's legitimacy.

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[82] This hypothesis is based on the apparent importance of analysis in influencing jury decisions. A responsible defense attorney presumably would attempt to explain the rationale for the analysis and how it played a constructive role in corporate decisions rather than accept the existence of an analysis as indicating that the firm displayed a reckless disregard for life.

Table 2 presents the results of respondents' assessments of the different scenarios. Each respondent considered only one of the seven scenarios. The number of respondents ranged from 96 for Scenario 5 to 104 for Scenario 6, or roughly 100 subjects each. Overall, 695 jury-eligible adults participated in the experiments.

In each case, respondents considered the corporate risk analysis scenario as well as other questions pertaining to their risk beliefs and attitudes. Focusing on the detailed written scenario description is, of course, a more limited exposure to a case than would occur in a trial context. Because this aspect of the study was common across all scenarios, any effect should be consistent across the results and only the differing aspects of the case descriptions should influence juror decisions. Actual trial experiences would provide a less effective experimental structure because differences in attorney presentation or other "live" factors would make it impossible to isolate the effects of the variables being studied.

The first question facing respondents after reading the scenario was whether they would award punitive damages. Each case scenario indicated that compensatory damages already had been awarded to the plaintiff. For the first two scenarios, in which no analysis was undertaken, the percentage awarding punitive damages was 85% for Scenario 1 and 92% for Scenario 2, a difference that was not statistically significant.

The appropriate reference point for judging the subsequent scenarios will continue to be how they differed from Scenario 1 as described above. Scenarios 3 through 7 each paralleled Scenario 1 in that the cost per life saved was $4 million, while they differed in terms of whether a risk analysis was undertaken and if so, what it entailed. The results for Scenarios 3, 4, and 5 with respect to whether punitive damages were awarded ranged from 93% to 95%, levels similar to the figures for Scenarios 1 and 2. It is noteworthy that when, in Scenario 6, the company did not use the analysis as part of its corporate decision-making, the percent favoring punitive damages dropped to 89%. Although this 89% figure still exceeds the 85% who would have awarded punitive damages for Scenario 1, the difference is not statistically significant. Remember that Scenario 1 was identical to Scenario 6, except that in the former, the company did no analysis whatsoever. This suggests that jurors cannot differentiate between the situation where a company disregards its risk analysis, and the situation where the company does not conduct a risk analysis at all.

Perhaps the most interesting results are those for Scenario 7, which suggest that it may be possible to communicate the usefulness of risk analysis to jurors. In that scenario, the percent favoring punitive damages dropped to 76%, which was the lowest for any scenario and was 9% below the value for Scenario 1.

What is striking about all of these results is that they indicate a very high willingness to impose punitive damages. When an automobile had a known defect and the company chose not to repair the car, jurors had a substantial willingness to impose punitive damages irrespective of whether the safety measure had been subjected to a rigorous economic analysis. In fact, undertaking an analysis justifying the decision tended to slightly increase the percentage of jurors awarding punitive damages. The exception was Scenario 7, in which a very strong effort was made to convey the fact that such risk analyses had led to substantial safety improvements in the past. Irrespective of the different variations in the cases, at least three-fourths of all respondents favored punitive damages. When companies feasibly could have reduced known risks for a fairly reasonable cost, the respondents generally viewed the failure to do so as reckless behavior.

Whereas there was not a great deal of difference in the frequency with which the jury-eligible citizens awarded punitive damages for the different scenarios, the levels of the awards exhibited more variation. The last two columns of Table 2 provide information on the geometric mean and the median award for the different scenarios.[83] The first two scenarios—in which no analysis was performed at all—had similar results with respect to the award level: roughly $3 million for the geometric mean and $1 million for the median award. Underlying modest differences in the cost of promoting safety seem to have little effect on the level of punitive damages awards. In contrast, undertaking a risk analysis using an $800,000 value of life as in Scenario 3 boosted the geometric mean award to $4 million and the median award to $3.5 million. Thus, the risk analysis led to higher levels of punitive damages awards.

What happened when the company conducted its analysis with the $3 million value of life used by the National Highway Traffic Safety Administration to evaluate the effectiveness of regulations? The results for Scenario 4 indicate that doing so did not dampen jurors' concerns with the analysis, but rather increased both the geometric mean award level and the median award level, with the median reaching a high value of $10 million. It therefore appears that rather than making risk analyses more acceptable to jurors, use of a high value of life that reflects greater concern for safety on the part of the company serves as an anchor that boosts jury awards to a higher level.[84] Often in punitive damages contexts, jury verdicts are influenced by the desire to send the defendant company a message.[85] In order to encourage companies to change their

[83] The median values are more representative and less distorted by outliers than the mean award levels. If, for example, a respondent were awarded $1 billion in punitive damages, that amount would greatly influence the average across all respondents and would distort a measure of how the typical juror would perform. The median is also the measure of how the critical individual in a majority rule context would value the damages, which also may be important as a prediction of jury behavior.

[84] For similar conclusions based on analysis of Scenarios 1 through 5, see Viscusi, *Corporate Risk Analysis*, *supra* note 6, at 558–59.

[85] *See supra* note 42 and accompanying text.

policies, respondents may have reasoned that they had to assess a higher punitive damages value than the amount warranted by the value of life that the corporation used in its own decision-making. Otherwise, they would not be sending the company a message that the risk-cost analysis had undervalued human life. The high anchor value also may make jurors more reluctant to see the company make a sensitive tradeoff between risk to life and costs.

The results for Scenario 5, in which the company overestimated the costs, were similar to those for Scenario 4. From an economic standpoint, the company was actually more remiss in Scenario 5 than in Scenario 4 because the safety improvements in Scenario 5 were efficient on an economic basis. Nevertheless, there seems to be no evidence that the jurors want to punish the company for these errors in the cost estimates. There was no apparent effect on the frequency of punitive damages awards that could be traced to this difference. Rather, the jurors awarded damages similar to those awarded when the company took the efficient course of action. The jurors also awarded damages with similar frequency.

The final two scenarios directed at ameliorating the jurors' concerns each appeared to be somewhat successful in diminishing the damages awards. If the company did not in fact use the analysis in its automobile design, the geometric mean award dropped to $2.5 million, and the median award was $3 million. These results were similar in character to the results for the no-analysis Scenario 1. The difference between the two was that in Scenario 6, the company actually conducted a risk analysis, although that analysis never entered the decision-making process. Interestingly, the median award in Scenario 6 is above the median award in Scenarios 1 and 2, so it appears that doing an analysis that is not used affects the distribution of punitive damages awards adversely when compared against not doing an analysis at all.

Scenario 7 represented the attempt to decrease the punitive sanctions by elaborating on the constructive role that other analyses had played in car design decisions. This led to somewhat lower values for the geometric mean award than any of the other scenarios, as well as a median award level of $1 million that equaled those for Scenarios 1 and 2. It therefore appears that undertaking a responsible corporate risk analysis consistent with government regulatory practices may have a modest effect both on the frequency of punitive damages awards and on the value of the geometric mean award, reducing both figures. Still, the frequency and level of the sanctions remained quite substantial even when efforts were made to explain the nature of the analysis to the jury. Perhaps a company that successfully justifies its risk analysis as a safety-enhancing exercise can reduce the likely punitive damage sanctions. The effect is, however, modest, as jurors still remain willing to award damages. Despite the value of risk-cost analyses for obtaining efficient safety outcomes, even well-educated jurors fail to reward companies for such efforts.

## IV. Rules for Setting Punitive Damages[86]

The results above suggest that jurors may be more likely to award punitive damages against companies that perform risk analyses. Given jurors' failure to use risk analysis evidence constructively, one might ask whether a much tighter structure imposed on punitive damages awards could change their behavior. In particular, what if jurors were given explicit mathematical formulas for setting punitive damages? Such guidelines have, in fact, already been proposed in a set of model jury instructions by Polinsky and Shavell.[87] In this Part of the Article, I report on results of a study in which I gave subjects a case scenario and asked them to apply the Polinsky and Shavell damages formulas.

The essence of the Polinsky-Shavell damages approach is that the total damages should equal the amount of harm divided by the probability that this harm will be detected.[88] If there is a fifty percent chance that the harm will be detected, the total penalty should be twice the value of the damages incurred so that the expected damages borne by the offending company will equal the level of the harm inflicted. If the harm will be detected with certainty, then the amount of total damages should equal the amount of harm, or the compensatory damages amount. Punitive damages should equal zero. With the Polinsky-Shavell instructions, the court does not give the jurors the probability of detection; rather, the jury must assess this parameter. My experimental design simplifies this task by giving jurors the probability of detection. The basic case scenario involved toxic waste disposal. In order to link this behavior with the Polinsky-Shavell formula, the case included an explicit indication of the probability that the violation would be detected.

In the typical case scenario, the study participant was told that the Toxic Chemical Research Institute had twelve steel drums of dangerous chemicals to dispose of before a major production run. The shift manager was worried about the accumulating chemicals and wanted to find an easy way to dispose of them. The probabilities of detection of illegal disposal are summarized in the middle column of Table 3. In the first scenario, the company disposed of the chemicals in a nearby stream behind the plant, realizing that there was a twenty-five percent chance that the EPA inspector was going to be visiting the plant. Consequently, there was a seventy-five percent chance that the EPA inspector would not visit the

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[86] See Viscusi, *Challenge of Punitive Damages*, *supra* note 7 for further discussion of these experimental results.

[87] *See* Polinsky & Shavell, *supra* note 7.

[88] *Id.* at 889.

plant, and that the company would not be caught. The scenario indicated that the EPA inspector did identify the spill and that the company was fined $100,000 to cover water treatment costs. The question was whether there should be punitive damages and, if so, what amount should be levied. Under the Polinsky-Shavell approach, the total damages should equal the total harm divided by the probability of detection, or $100,000 divided by 25%, or four times the economic loss, for a total of $400,000.

Scenario 2 was identical to Scenario 1 except that the detection probability was 1%. Thus, there was a 99% chance of escaping any penalty. Under the formula, the total damages levied for Scenario 2 should have been 100 times the economic loss. It should be noted that in Scenario 2, the detection probability is fixed by EPA inspection practices and cannot be manipulated by the polluter.[89]

Scenario 3 modified Scenario 2 in terms of the character of the company's behavior. The company loaded the chemical drums onto unmarked trucks and dumped the chemicals in a rural stream at 3 a.m. The manager did this because he hoped that this late-night dumping would reduce the risk of getting caught. Whereas the company in Scenario 2 also deliberately dumped chemicals in a stream that it knew might be inspected by the EPA, the low 1% probability of detection was outside of the control of the polluter. In contrast, in Scenario 3 the low probability of detection arose because the company engaged in stealthy behavior with the intention of decreasing the probability of detection. One therefore might expect the jurors to award higher penalties to punish the polluter's stealth.

Scenario 4 maintained the stealthy disposal assumption from Scenario 3 but added an anchoring factor. The study participants were told by the plaintiff's attorney that in order to send the company an appropriate signal to be more responsible, there should be a penalty of $50 million, or about 20% of the company's net worth. The attorney further argued that the minimum penalty should be $25 million, and, as a consequence, the penalty range to be considered by the jury should be between $25 million and $50 million.[90]

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[89] Because full enforcement is costly, agencies generally do not have the resources to monitor every potential offender on a continuing basis, and detection probabilities will be less than one.

[90] Scenario 4 quoted the plaintiff's attorney:

> Your job as jurors is to impose a penalty which will make this corporation, and others, conduct their business in a way which protects the defenseless citizens of Texas who have no other way of getting the company to be responsible. This is your job. A penalty against this company has to be one that they will notice. It would not destroy this company or even cause them long term financial harm to impose a penalty on them of $50 million, about 20% of their net worth, or about two and one-half times their annual profit. Certainly a minimum penalty should be one year's profit, about $25 million, so the range you may want to consider is between $25 million, about one year's profit, and $50 million. I don't think that anything less than $25 million would have much effect as far as deterring them

Scenario 5 provided similar anchors, though in this case the quoted damages amount came from a newspaper article indicating that in a similar case in California, there had been a jury award of $50 million in punitive damages. The newspaper article also told the jurors that the appeals court reduced this award to $25 million.[91]

As in the case of the corporate risk analysis experiment, subjects considered only one of these different scenarios. The total number of participants in this experiment was 353. Each of the participants was given the Polinsky-Shavell jury instructions, which ask people to calculate three dollar amounts.[92] The first is the deterrence amount, which is inversely related to the probability of detection.[93] To assist in calculating this figure, Polinsky and Shavell provide a table so that jurors can determine the damages without any mathematical computation.[94] All participants in the study received a copy of this table.

The second portion of the instructions tells jurors to calculate a punishment amount to penalize blameworthy employees at the firm.[95] Qualitative guidelines are provided for considering this question, but the instructions do not give the jurors a punishment formula.[96] Jurors are then asked what amount of punitive damages should be awarded from the standpoint of punishment. Thus, this formula couples one subjective element with other objective components. Moreover, the subjective component is firmly grounded in detailed criteria for setting the punishment value.

The third component of the damages calculation involves finding the final size of the punitive damages award.[97] The instructions indicate that "[p]unitive damages should be an amount between the amount that you found appropriate for the purpose of deterrence and the amount that you found appropriate for the purpose of punishment."[98] Thus, the final num-

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and getting them to be more careful in their operations.

[91] Scenario 5 stated:

> Before being placed on the jury you read about a similar case that took place in California. A jury there fined the company $50 million in punitive damages. However, the company appealed claiming the award was excessive. The punitive damages amount was reduced to $25 million by the appeals court in California. The company claimed that this amount was still too high and that it would continue to fight the award in court.

[92] Polinsky & Shavell, *supra* note 7, at 960.
[93] *See id.* at 960–61.
[94] *See id.* at 962.
[95] *Id.* at 961.
[96] For example, the instructions direct jurors to base the punishment amount on whether the defendant can identify blameworthy employees and whether shareholders or customers will be impacted negatively by punitive damaged levied on the defendant. *Id.*
[97] *See id.* at 962.
[98] *Id.*

ber for the punitive damages should fall between the deterrence value, which is governed by an explicit mathematical formula, and the punishment value, which is governed by a less precise set of standards.

How well did the jurors adhere to the instructions? The final column of Table 3 indicates the percentage of respondents who calculated the deterrence value of punitive damages correctly in view of the Polinsky-Shavell formula. For Scenario 1, 20% of the respondents correctly applied the formula, while 80% were unwilling or unable to do so. In the second scenario, in which the probability of detection was lower and the total value of damages consequently was boosted substantially according to the formula, the mock jurors appeared to be less willing to impose the substantial sanctions. The percentage of jurors who assessed a correct deterrence value for this scenario dropped to 11%. In contrast, if the behavior of the company was described as stealthy, people were more willing to impose the high deterrence punitive damage amounts prescribed by the formula. The results for Scenario 3 indicate that 21% of the respondents assessed a correct deterrence value.

If the instructions are to be effective, in the real world people must follow these guidelines rather than extraneous information presented as part of the case. Scenarios 4 and 5 considered the role of anchoring through statements by the plaintiff's attorney and information in newspaper articles on similar litigation. What we find is that once given these convenient anchors to latch onto, jurors tended to disregard the Polinsky-Shavell instructions to an even greater extent than before. Indeed, for Scenario 4, in which the plaintiff's attorney suggested an anchoring figure, only 7% of all respondents calculated the deterrence value correctly. This low statistic is particularly noteworthy because the computation required only minimal mathematical skills to execute.[99] This suggests that factors other than lack of mathematical ability led jurors to abandon the formula.[100]

The levels of damages awarded by the participants in the study are summarized in Table 4. For the first three scenarios, the damages from the standpoint of deterrence averaged approximately \$3 million to \$4 million, while the punishment values ranged between approximately \$1 million and \$6 million. Final award levels for these scenarios were approximately between \$3 million and \$6 million.[101]

[99] The damages amount was \$100,000 in the case, and with a probability of escaping liability of 99%, the appropriate multiplier for punitive damages from the Polinsky-Shavell table is 99, leading to an optimal deterrence value of \$9.9 million. Despite the simplicity of this calculation, 93% of the subjects reported deterrence values other than this correct amount.

[100] Controlling for personal characteristics and differences in the scenarios, only Scenario 4 exhibits statistically significant differences in terms of the probability of answering the deterrence questions correctly. See Viscusi, *Challenge of Punitive Damges*, *supra* note 7, at 339.

[101] The fact that Scenario 1 has a higher punishment value than Scenarios 2 and 3 and a

Matters change substantially when we examine Scenario 4, in which there was a plaintiff anchoring effect. These anchors increased the deterrence value by roughly an order of magnitude from the previous scenarios. Indeed, Scenario 3 was identical to Scenario 4 except for the presence of the plaintiff's anchor information. Yet, for the deterrence value, the punishment value, and the final punitive award, the responses for Scenario 4 were approximately 10 times greater than for Scenario 3. These effects were almost as strong, but not to the same extent, for Scenario 5.

What these results indicate is that not only do people fail to apply the deterrence value formula from the Polinsky-Shavell instructions correctly, but when presented with extraneous information, they do not appear constrained by the discipline offered by the formula and instead rely on more convenient anchors that may be either more compelling or easier to execute. These conclusions do not bode well for the Polinsky-Shavell instructions' potential to alter juror performance.

The role of anchoring raises the broader issue of whether anchors should or should not be provided to jurors. Meaningful anchors, such as those tied to the Polinsky-Shavell formulas, would be more useful than arbitrary anchors that have the appearance of rigor, but in fact are completely unrelated to how damages values should be set.

A final pertinent measure of the extent to which the damages instructions will be effective is whether people follow the third part of the instructions. That task is fairly simple, as respondents only have to find a final punitive damages award between the deterrence value and the punishment value. If jurors are willing to be disciplined at all by instructions, then presumably they should be able to follow such simple directions. Notwithstanding the simplicity of this mathematical task, an average of only 76% of the respondents were able to come up with a final award amount that was between their deterrence amount and their punishment value. The high percentage of jurors who failed in their task suggests that they may have been straying deliberately from the formula, rather than failing in its application due to poor math skills.

## V. Conclusion

These studies send a bleak message to those with the objective of bringing about more efficient damages awards, because they suggest that jurors punish careful corporate decision-making on safety issues. Instead of interpreting risk analyses as evidence that defendants tried to meet their duty of care, jurors view such studies negatively when awarding punitive damages. Undertaking a risk analysis may both increase juror

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punishment value in excess of the deterrence value seems largely due to the influence of outliers rather than systematic factors.

willingness to impose damages and also increase the size of the damages award. Jurors are unwilling to recognize that corporate risk analyses have a legitimate role to play and should not subject defendants to additional sanctions.

Explicit mathematical formulas also fail to induce efficient damages awards. Despite the straightforward nature of the Polinsky-Shavell instructions, most jurors failed to implement them correctly. In fact, many of the respondents disregarded even the most fundamental aspects of the instructions, such as the guidance that the total award should lie between the deterrence and punishment values.

A common theme of these results is that anchoring effects are often operative. If companies use higher values of life in their risk analyses, jurors seek to impose even higher levels of damages so as to send a signal to the corporation regarding their valuation of safety. Thus, companies that use a higher value of life that reflects a greater concern with safety may suffer the perverse consequence of increasing rather than decreasing their liability.

Not even explicit instructions or mathematical formulas can eliminate anchoring effects. When the plaintiff's attorney or a newspaper account suggested dollar amounts, the respondents based their damages awards on these values even though they had been told to follow the punitive damages instructions. These results highlight the dangers of attorneys naming dollar values that may anchor damages assessments on arbitrary amounts.

These findings suggest that there is no simple remedy for changing juror performance with respect to the award of punitive damages. These disappointing results do not imply that no effective solution exists. Perhaps, for example, one could rewrite the jury instructions in such a way that people would in fact choose to apply them when making their determination of the damages levels. Whether different sets of instructions could be implemented properly and would in fact be used by jurors cannot be determined without testing their performance in an experimental setting. What we can conclude at this juncture is that the current formulation is ineffective. Neither the Polinsky-Shavell instructions nor evidence of risk analysis enables jurors to focus on the efficiency of damages awards.

Table 1
Summary of Corporate Risk Analysis Case Scenarios

| Scenario | Risk-Cost Analysis | Risk Value of Life | Cost per Life Saved | Other Case Components |
|---|---|---|---|---|
| 1 | No | N/A | $4 million | - |
| 2 | No | N/A | $1 million | - |
| 3 | Yes | $800,000 | $4 million | - |
| 4 | Yes | $3 million | $4 million | - |
| 5 | Yes | $3 million | $4 million | Actual benefits exceeded |
| 6 | Yes | $3 million | $4 million | Company did not use analysis |
| 7 | Yes | $3 million | $4 million | Company based past improvements on analysis |

TABLE 2
CORPORATE RISK ANALYSIS CASE RESULTS

| Scenario | Summary Description | Sample Size | Percent Favoring Punitive Damages | Geometric Mean Award ($ millions) | Median Award ($ millions) |
|---|---|---|---|---|---|
| 1 | No analysis, $4 million cost per life | 97 | 85 | 3.0 | 1.0 |
| 2 | No Analysis, $1 million cost per life | 97 | 92 | 2.9 | 1.0 |
| 3 | Analysis, $800,000 value of life | 97 | 93 | 4.0 | 3.5 |
| 4 | Analysis, $3 million value of life | 102 | 93 | 5.3 | 10.0 |
| 5 | Analysis, costs over-estimated | 96 | 95 | 4.5 | 10.0 |
| 6 | Analysis, did not use | 104 | 89 | 2.5 | 3.0 |
| 7 | Analysis, past im-provements noted | 102 | 76 | 2.1 | 1.0 |

TABLE 3
PUNITIVE DAMAGES SCENARIOS

| Scenario | Description | Sample Size | Percent Correct Deterrence Value |
|---|---|---|---|
| 1 | .25 detection probability | 70 | 20 |
| 2 | .01 detection probability | 72 | 11 |
| 3 | .01 probability, stealthy | 72 | 21 |
| 4 | .01 probability, stealthy, plaintiff anchoring | 70 | 7 |
| 5 | .01 probability, stealthy, newspaper anchoring | 69 | 14 |

TABLE 4
AVERAGE DAMAGES VALUES FOR SCENARIOS
($ MILLIONS)

| Survey Version | Deterrence Value | Punishment Value | Final Punitive Award |
|---|---|---|---|
| 1 | 2.9 | 5.6 | 5.7 |
| 2 | 3.8 | 1.4 | 3.5 |
| 3* | 3.7 | 2.4 | 3.2 |
| 4 | 34.1 | 29.2 | 34.8 |
| 5 | 20.1 | 16.4 | 22.3 |

* This sample is trimmed of one outlier who awarded damages in the billions.