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Punitive Damages: How Judges and Juries Perform

Joni Hersch and W. Kip Viscusi

ABSTRACT

This paper presents the first empirical analysis that demonstrates that juries differ from judges in awarding punitive damages. Our review of punitive damages awards of $100 million or more identified 63 such awards, of which juries made 95 percent. These jury awards are highly unpredictable and are not significantly correlated with compensatory damages. Using data on jury and bench verdicts from the *Civil Justice Survey of State Courts, 1996,* we find that juries are significantly more likely to award punitive damages than are judges and award higher levels of punitive damages. Jury awards are also less strongly related to compensatory damages. The differential effect of juries is most pronounced among the largest awards. Juries also tend to award higher levels of compensatory damages, which in turn boost the punitive damages award. The findings are robust with respect to controlling for self-selection of jury or bench trial.

1. INTRODUCTION

Runaway liability costs and highly publicized punitive damages awards led to a call among policy makers and legal scholars for tort reform starting in the 1980s. Notwithstanding the enactment of a variety of restraints on punitive damages awards, large awards still occur. For example, in 1999, a Los Angeles County jury awarded $4.8 billion in punitive damages against General Motors to a group of six burn victims whose Chevrolet Malibu was rear ended, causing it to catch fire (*An-*

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derson v. General Motors Corporation, 120 S. Ct. 424 [Mem.], 528 U.S. 976 [1999]). In 2000, a Dade County (Florida) jury awarded $145 billion in punitive damages in a class action case involving the tobacco industry (*Engle v. R. J. Reynolds Tobacco Co.,* No. 94-08273 CA 22 [Fl. Cir. Ct., 11th Jud. Dist., Dade Cty., November 6, 2000]).

Some reform advocates have hypothesized that punitive damages awards would be lower and more predictable if authority over these awards were transferred from jurors to judges. This view stems from the observation that very large punitive damages awards are typically reduced on appeal. Indeed, defenders of punitive damages often note that the appeals process greatly diminishes the influence of awards that may be regarded as outliers. Additional support derives from experimental research that shows that judges award lower levels of punitive damages than jurors when confronting the same case scenario.[1]

There is no firm empirical evidence in support of the widespread perception that juries are largely responsible for the major punitive damages awards. This paper provides empirical evidence on the comparative roles of judges and juries in awarding punitive damages by taking two approaches. First, we systematically searched for punitive damages awards of at least $100 million. We identified 63 such awards over the period January 1985–June 2003. Only three of these blockbuster awards were set by a judge rather than by a jury. This tendency of large punitive awards to be the result of jury decisions is consistent with the experimental evidence as well as popular perceptions. Analysis of these very large awards indicates that they bear no statistical relation to the compensatory awards.

We follow this analysis of extremely large awards with empirical evidence from the *Civil Justice Survey of State Courts, 1996.* The Civil Justice Survey of State Courts provides information on over 9,000 cases tried to a verdict in 1996 in 45 state courts. This data set provides a representative sample of trial outcomes rather than a selection of trials that result in extreme awards. We find that, controlling for compensatory damages, case mix, and other characteristics, juries are more likely to make punitive awards and make larger awards. These findings are robust with respect to alternative empirical specifications and estimating procedures, including recognition of self-selection of trial forum. We also find that juries award greater compensatory damages than do judges for

1. For an overview, see Sunstein et al. (2002). Studies that provide a comparison of judges and juries are Viscusi (1999, 2001) and Hastie and Viscusi (1998).

any given case type. These higher compensatory damages awards in turn boost punitive damages awards.

Using the same data set, Eisenberg et al. (2002) found that juries and judges do not differ significantly in their awards of punitive damages or in the predictability of their punitive awards. We examine the reasons why our findings strongly contradict those in Eisenberg et al. Our analysis identifies two pivotal differences. First, their study undermined the potential influence of the jury effect by including two jury-related variables in their analysis, thus inducing multicollinearity. Second, differences across counties in judge and jury performance were ignored in their analysis but are significant influences that must be taken into account. All other variations between the two studies lead to results that are consistent with our general finding that juries have a greater tendency to award punitive damages than do judges.

2. THEORETICAL AND EMPIRICAL CONCERNS

In this section, we provide an overview of the law and economics of optimal punitive damages and discuss selection effects with respect to trial forum. Starting with optimal punitive damages, law and economics theory implies that for purposes of optimal deterrence, the total award should equal the economic value of the harm divided by the probability of being found liable.[2] If the compensatory damages amount equals the economic harm, then punitive damages should vary linearly with the value of compensatory damages for any given probability of being found liable. To see this relation, denote punitive damages by PD, compensatory damages by CD, and the probability of being found liable by s. Then the award leading to optimal deterrence is given by

$$\mathrm{PD} + \mathrm{CD} = \frac{\mathrm{CD}}{s}. \tag{1}$$

This equation can be rewritten as[3]

$$\mathrm{PD} = \left(\frac{1-s}{s}\right)\mathrm{CD}. \tag{2}$$

2. A recent review of the underpinnings for punitive damages is Polinsky and Shavell (1998). The intellectual origins of this approach can be traced back to Bentham (1962) and Becker (1968).

3. This equation is equivalent to that in footnote 51 of Polinsky and Shavell (1998) setting CD equal to the value of the harm.

Whether a particular ratio of punitive damages to compensatory damages is appropriate depends on the probability of being found liable. But irrespective of the value of this probability, there should be a linear relation between compensatory damages and punitive damages for any given value of s. The relation between punitive damages and compensatory damages does, however, vary with s, which differs across cases. Consequently, it is instructive to take logs of equation (2) and express the relation as

$$\ln \mathrm{PD} = \ln\left(\frac{1-s}{s}\right) + \ln \mathrm{CD}. \tag{3}$$

Thus, there is a linear relation between the log of punitive damages and the log of compensatory damages across cases with different probabilities of being found liable. We examine this linkage as an index of the degree to which punitive damages satisfy law and economics principles.

Selection arises from the choice of trial forum and the effect of trial forum on the probability of trial. Joni Hersch (2003) finds that plaintiffs demanding larger damages awards are more likely to demand a jury trial and that cases in which a jury trial is demanded are more likely to settle rather than continue to trial.[4] If, say, plaintiffs who expect to get a large punitive damages award also believe that they will get an even larger award if heard by a jury than by a judge, these plaintiffs may self-select into a jury trial. If these cases are likewise more likely to settle, the effect of jury trial among cases tried to verdict may be understated. The Civil Justice Survey of State Courts provides data only on cases tried to verdict, so we are not able to correct for selection effects that arise from differential probability of trial by trial forum. Using available data, we control for potential selection effects that remain after the settlement stage by estimating a first-stage regression of the choice of trial type followed by the estimate of our punitive damages equations controlling for the selectivity correction term.

3. BLOCKBUSTER AWARDS

To examine whether juries and judges differ in their tendency to make extremely large punitive damages awards, we undertook a detailed

4. The standard case selection model focuses on the settlement decision abstracting from the choice of trial forum. If the decision maker has a particular bias, parties will take these influences into account at the settlement stage. See Priest and Klein (1984).

search to identify all cases in which there were punitive damages of at least \$100 million. The search included Lexis Combined Jury Verdicts and Settlements (which includes bench trials as well as jury trials), several Westlaw databases, the Google search engine, major newspapers, and articles in *American Lawyer*. We identified 63 such awards for the period from January 1985 to June 2003. Although the resulting list may not be complete, it is an extensive and systematically compiled list of the largest punitive damages awards in U.S. court cases.

Our analysis of these blockbuster awards supplements the analysis of the 1996 state courts trials data that begins in the next section. Punitive awards in excess of \$100 million are quite rare. Despite their rarity, it is the large awards that figure prominently in discussions of civil justice reform. But given their rarity, any statistically based sample of trials, such as the state courts data, is unlikely to include many cases with large punitive damages awards.

Table 1 summarizes these punitive damages awards. The table is divided into two groups on the basis of whether the initial trial outcome resulted in a punitive damages award by a judge or by a jury. Within each category, cases are listed in order of increasing size of the punitive damages amount.[5] Notice that judges made only three of these large awards. *Avery v. State Farm Mutual Automobile Co.* was actually a jury trial in which the jury set compensatory damages of \$456 million for the breach-of-contract count. However, the judge set damages for the fraud count, setting the punitive damages award at \$600 million and the compensatory damages award at \$130 million.

Juries set the remaining 60 punitive awards of at least \$100 million, of which 11 were for at least a billion dollars. The largest punitive damages award is \$145 billion awarded for the Florida tobacco class action, *Engle v. R. J. Reynolds Tobacco Co.* An individual plaintiff cigarette case, *Bullock v. Philip Morris,* generated the second largest punitive damages award of \$28 billion. The environmental contamination suit for the Exxon *Valdez* oil spill led to \$5 billion in punitive damages, while the GM products liability burn case had a \$4.8 billion award. Four awards were in the \$3 billion range: a royalty payments fraud case against Exxon, a New Orleans tank car leakage products liability case, a products liability case against Texaco, and a cigarette products liability

5. Defendants often do not pay the punitive damages amounts listed in Table 1. Many awards have been overturned or reduced on appeal, and others have settled privately or are still under appeal.

Table 1. Summary of Punitive Damages Awards of at Least $100 Million

Case Name	Year of Decision	Punitive Damages Award ($ Millions)	Compensatory Damages Award ($ Millions)	Ratio of Punitive Damages to Compensatory Damages
Bench Punitive Awards:				
Clayton D. Smith et al. v. Delta TV Corporation, Don Acy, U.S. Electronics, American General Financial Center (Mississippi)	1995	167.00	.50	334.0
Avery v. State Farm Mutual Insurance Automobile Co. (Illinois)	1999	600.00	130.00	4.6
Miles v. Philip Morris Inc. (Illinois)	2003	3,100.00	7,100.00	.4
Jury Punitive Awards:				
Hedrick v. Sentry Insurance Co. (Texas)	1993	100.00	2.17	46.1
Forti v. General Dynamics Corp. (California)	1996	100.00	7.40	13.5
Hardy v. General Motors Corp. (Alabama)	1996	100.00	50.00	2.0
Aaron v. Abex Corp. (Texas)	1998	100.00	15.60	6.4
Aultman v. Duncan Manufacturing (Alabama)	1999	100.00	14.50	6.9
City of West Allis v. Wisconsin Electric Power Co. (Wisconsin)	1999	100.00	4.50	22.2
Dorman v. Bridgestone/Firestone Inc. (Missouri)	2000	100.00	5.00	20.0
Timely Adventures Inc. v. Coastal Mart Inc. (Texas)	2000	100.00	2.10	47.6
Moseley v. General Motors Corp. (Georgia)	1993	101.00	4.24	23.8
Tennessee Gas Pipeline Co. v. KCS Resources Inc. (Texas)	1996	114.09	29.00	3.9
Goodrich v. Aetna U.S. Healthcare of California Inc. (California)	1999	116.00	4.50	25.8
Robinson v. Ford Motor Co. (Mississippi)	1998	120.00	24.88	4.8
Alcorn v. National Railroad Passenger Corp. (Missouri)	1999	120.00	40.40	3.0
Carroll v. Interstate Brands Corp. (California)	2000	121.00	11.00	11.0
Proctor v. Davis and Upjohn Co. (Illinois)	1991	124.57	3.15	39.5
Micro/Vest v. ComputerLand (California)	1985	125.00	400.00	.3
Martin v. ServiceMaster Co. L.P. (Georgia)	1999	135.00	1.26	107.1
Martin v. Children's Advanced Medical Institutes (Texas)	2000	137.00	131.60	1.0

50-Off Stores Inc. v. Banque Paribas (Suisse) S.A. (Texas)	1997	138.00	12.90	10.7
Campbell v. State Farm Mutual Automobile Insurance Co. (Utah)	1996	145.00	2.60	55.8
In Re: Technical Equities Litigation (California)	1988	147.00	7.00	21.0
Coyne v. Celotex Corp. (Maryland)	1989	150.00	2.00	75.0
Broussard v. Meineke Discount Muffler Shops Inc. (North Carolina)	1996	150.00	196.96	.8
The Robert J. Bellott Insurance Agency Inc. v. State Farm Mutual Automobile Insurance Co. (Alaska)	1999	150.00	2.70	55.6
Schwarz v. Philip Morris Inc. (Oregon)	2002	150.00	.17	882.4
Claghorn v. Edsaco (California)	2002	165.00	5.70	28.9
Dominguez Energy L.P. v. Shell Oil Co. (California)	1993	173.00	46.88	3.7
Bartlett v. Mitchell Energy Corp. (Texas)	1996	200.00	4.05	49.4
MMAR. v. Dow Jones (Texas)	1997	200.00	22.70	8.8
City of Hope National Medical Center v. Genentech (California)	2002	200.00	300.10	.7
Steele Software Systems Corp. v. First Union (Maryland)	2002	200.00	76.00	2.6
Whittington v. U.S. Steel (Illinois)	2003	200.00	50.00	4.0
Houchens v. Rockwell International Corp. (Kentucky)	1996	210.00	7.70	27.3
Rubicon Petroleum Inc. v. Amoco Production Co. (Texas)	1993	250.00	125.00	2.0
Jimenez v. Chrysler Corp. (South Carolina)	1997	250.00	12.50	20.0
Six Flags Over Georgia L.L.C. v. Time Warner Entertainment Co. L.P. (Georgia)	1998	257.00	197.00	1.3
Romo v. Ford Motor Co. (California)	1999	290.00	5.30	54.7
Perez v. William Recht Co., Inc., dba Durex Industries Inc. (Florida)	1995	300.00	200.00	1.5
Fuqua v. Horizon/CMS Healthcare Corp. (Texas)	2001	310.00	2.71	114.4
Maryland Deposit Insurance Fund v. Seidel (Maryland)	1988	322.00	65.00	5.0
Pioneer Commercial Funding Corp. v. American Financial Mortgage Corp. (Pennsylvania)	2000	337.50	14.50	23.3
COC Services Ltd. v. CompUSA Inc. (Texas)	2001	364.50	90.00	4.1
Amoco Chemical Co. v. Certain Underwriters at Lloyd's of London (California)	1993	386.40	36.00	10.7
O'Keefe v. Loewen Group Inc. (Mississippi)	1995	400.00	100.00	4.0

Table 1. *continued*

Case Name	Year of Decision	Punitive Damages Award ($ Millions)	Compensatory Damages Award ($ Millions)	Ratio of Punitive Damages to Compensatory Damages
Cassoutt v. Cessna Aircraft Co. (Florida)	2001	400.00	80.00	5.0
IGEN International Inc. v. Roche Diagnostics GmbH (Maryland)	2002	400.00	105.00	3.8
Carlisle v. Whirlpool Financial National Bank (Alabama)	1999	580.00	.98	594.9
Maddux v. Einhorn (Pennsylvania)	1999	752.00	155.00	4.9
Lockheed Litigation Cases, Judicial Council Coordination Proceeding, 2967 (California)	1998	760.00	25.40	29.9
Cowart v. Johnson Kart Manufacturing Inc. (Wisconsin)	1999	1,000.00	24.00	41.7
Grefer v. Alpha Technical Services Inc. (Louisiana)	2001	1,000.00	56.13	17.8
Hayes v. Courtney (Missouri)	2002	2,000.00	225.00	8.9
Pennzoil Co. v. Texaco Inc. (Texas)	1985	3,000.00	7,530.00	.4
Boeken v. Philip Morris Inc. (California)	2001	3,000.00	5.54	541.6
In re New Orleans Tank Car Leakage Fire Litigation (Louisiana)	1997	3,365.00	2.00	1,682.5
Exxon Corp. v. Department of Conservation and Natural Resources (Alabama)	2000	3,420.00	87.70	39.0
Anderson v. General Motors Corp. (California)	1999	4,775.00	107.60	44.4
In re: The Exxon Valdez (Alaska)	1994	5,000.00	287.00	17.4
Bullock v. Philip Morris Inc. (California)	2002	28,000.00	.65	43,076.9
Engle v. R. J. Reynolds Tobacco Co. (Florida)	2000	145,000.00	12.70	11,417.3

Note. The list of cases was compiled by search of various sources as described in the text. The information for most cases is reported in *The National Law Journal*. Information for *Hayes v. Courtney*, *Maryland Deposit Insurance Fund v. Seidel*, and *Maddux v. Einhorn* is based on reports in the *New York Times*. Information on *Clayton Smith v. Delta* is reported in the American General Financial, Inc., 1999 10-K form. The compensatory damages amount in *Micro/Vest v. ComputerLand* is 20 percent of the value of the stock, which plaintiffs estimated to be worth $400 million. For *Bartlett v. Mitchell Energy Corp.*, we include the exemplary damages value of $200 million under the punitive damages heading.

case against Philip Morris. A case involving dilution of prescription drugs for a cancer patient led to a $2 billion award. At the $1 billion level were an environmental contamination suit against Alpha Technical Services, Inc., and a products liability case against Johnson Kart Manufacturing.

That juries account for 95 percent of these blockbuster awards is a notable statistic. Jury trials account for about 68 percent of all civil cases tried to verdict in state courts and federal district courts.[6] The difference between the observed 95 percent share of blockbuster awards by juries and the expected share of 68 percent jury awards is statistically significant and indicates that juries awarded a disproportionate share of the blockbuster awards.[7]

The year of the initial trial decision appears in the second column of Table 1. Although the era of $100 million-plus awards extends from January 1985 to June 2003, during the first half of this period there were only 11 such awards, while during the latter half there were 52 awards. The sum of punitive awards since 2000 accounts for 88 percent of the total dollar value of all 63 awards.

A widely cited barometer of whether a punitive damages award is out of line is the ratio of the punitive damages award to the compensatory award. This ratio has been a matter of concern in U.S. Supreme Court decisions, but only in 2003 did the Court offer guidance on what maximum ratio would usually be considered acceptable.[8] As Table 1 demonstrates, the ratio of punitive damages to compensatory damages varies considerably. Punitive damages are not always larger than compensatory damages. Sometimes, however, the ratio is extremely high. For

6. See U.S. Department of Justice (1999, p. 1), which reports that 10,616 of 15,638 cases disposed of by trial in 1996 in the 75 most populous counties were jury trials. Federal statistics on civil cases in which there was a court action during or after trial in U.S. district courts for the year ending June 30, 2001, indicate that there were 3,747 jury trials out of a total of 5,593 trials, or a jury share of .67. See http://www.uscourts.gov/judiciary2001/tables/c04jun01.pdf, table C-4.

7. The z-value is 4.6, which indicates the probability that the observed disparity occurred by chance is miniscule. There may, of course, be differences in case mix, as we address below using the state court data. Furthermore, we cannot rule out that these extremely large awards are made predominantly by juries precisely because the potential of a large jury award causes such cases to be sorted into a jury trial.

8. In *State Farm v. Campbell,* the Supreme Court stated, "[I]n practice, few awards exceeding a single-digit ratio between punitive and compensatory damages, to a significant degree, will satisfy due process. . . . When compensatory damages are substantial, then a lesser ratio, perhaps only equal to compensatory damages, can reach the outermost limit of the due process guarantee" (123 S. Ct. 1513 [2003]).

example, the ratio of punitive damages to compensatory damages in *Bullock v. Philip Morris* is 43,077.

Whether punitive damages are correlated with compensatory damages is a recurring question in the literature.[9] We estimate the relation between punitive damages and compensatory damages for the 60 jury awards listed in Table 1 using levels as well as logarithms of damages values. Taking the logarithm of both punitive and compensatory damages greatly compresses the range of values, particularly for large awards. Simple regression of these 60 punitive damages amounts against compensatory damages values indicates that these amounts have no statistically significant relation, whether the analysis is in terms of levels or logs of these damages awards. In the levels regression, the coefficient and standard error on compensatory damages are −.20 (2.57), with an adjusted R^2 of −.02. The corresponding values in the logs regression are .12 (.10), with an adjusted R^2 of .01. While punitive awards and compensatory awards are generally awarded to the same set of plaintiffs, in *Engle v. R. J. Reynolds Tobacco Co.,* compensatory damages were set for the class representatives, but punitive damages were set with respect to the entire class of smokers. Excluding *Engle,* the coefficient and standard error in the levels equation are .25 (.51), with an adjusted R^2 of −.01, and in the logs equation are .14 (.08), with an adjusted R^2 of .03. For the blockbuster award sample, the value of the compensatory award is not a significant predictor of the value of punitive damages.

4. DESCRIPTION OF THE *CIVIL JUSTICE SURVEY OF STATE COURTS, 1996* DATA SET

The *Civil Justice Survey of State Courts, 1996* is a sample of tort, contract, and real property rights cases that were disposed of by trial in calendar year 1996 (U.S. Department of Justice 2001).[10] The 1996 survey used the same sampling frame as a similar 1992 survey of jury trial cases but expanded the study to include both bench and jury trials. The in-

9. For assessments on the predictability of punitive damages or the lack thereof, see Eisenberg et al. (1997) and Polinsky (1997). Eisenberg et al. (1997) take a point of view outside the mainstream and claim that punitive damages are highly predictable and, in particular, that punitive damages can be reliably predicted by compensatory damages.

10. The data were collected by the National Center for State Courts under a grant from the U.S. Department of Justice, Bureau of Justice Statistics. Information on the data collection procedure and variable availability is provided in the computer file documentation.

formation reported for each trial includes type of trial (jury, judge, or other),[11] type of case (motor vehicle accident, fraud, employment discrimination, and so forth), type of litigant (individual, hospital, business, and so forth), the amount of compensatory and punitive damages if awarded, and county.

The sampling procedure used by the Civil Justice Survey of State Courts was a two-stage stratified sample. In the first stage, 45 counties were selected from the 75 most populous counties, with selection rates varying by the number of civil cases in that county in 1990. If there were fewer than approximately 300 bench or 300 jury trials in the county, all trials meeting the survey criteria were included in the study. In 36 counties, all trials were included in the data set. When there were more than 300 trials of either kind, a random sample of 275 cases of that trial type was selected. Any remaining cases of medical malpractice, professional malpractice, or products liability that were not in the initial random sample were also included in the sample. The number of trials varied considerably among the counties. At the low end, Honolulu, Hawaii, contributed only 25 jury trials and 21 bench trials to the sample, while Allegheny, Pennsylvania, contributed 201 jury trials and 202 bench trials. There were 10 or fewer bench trials in six of the counties.

The 1996 survey reports information on 9,025 trials in 45 state trial courts. Not all of the 9,025 cases are used in our analyses, mainly because of missing data. One case we exclude from our analyses is a jury-awarded compensatory damages award of over $40 billion, with no punitive damages, against Ferdinand and Imelda Marcos, which was reversed by the Hawaii Supreme Court (see U.S. Department of Justice 1999, p. 8). Of the remaining 9,024 trials, 227 were neither jury nor bench verdicts, 216 were missing data on the compensatory damages award,[12] and 85 had missing information on either case type or litigant pair. Thus, the full sample for the analyses is composed of 8,496 observations. Of these 8,496 observations, the plaintiff prevailed in 4,336 trials.[13]

Figure 1 summarizes the overall structure of the trials in the sample. Roughly three-fourths of the sample consists of jury trials, and one-

11. These included directed verdicts, judgments notwithstanding the verdict, and jury trials for defaulted defendants.

12. There are no cases in which compensatory damages are missing but punitive damages are reported, so there is no additional loss of observations due to missing data on the value of punitive damages.

13. There are 14 cases in the sample in which the defendant received a punitive damages award. These cases are not analyzed in this paper.

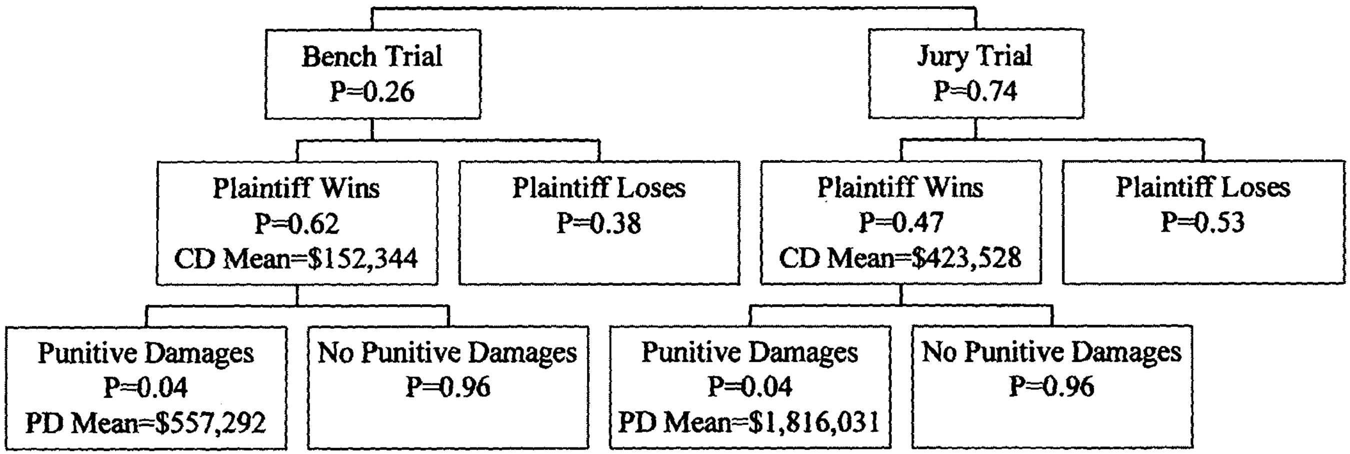

Figure 1. The structure of litigation in *Civil Justice Survey of State Courts, 1996*

Table 2. Characteristics of Damages Awards

	Jury	Bench	Combined
Number of trials	2,972	1,364	4,336
Number with PD > 0	119	54	173
Percent with PD > 0	4.00	3.96	3.99
PD characteristics if > 0:			
Mean ($)	1,816,031	557,292	1,423,130
Standard deviation	12,974,300	3,425,466	10,928,939
Median	50,000	33,000	40,000
Mean of log(PD)	10.69	10.16	10.53
CD characteristics:			
Mean ($)	423,528	152,344	338,220
Standard deviation	1,868,729	982,626	1,647,057
Median	45,000	25,000	36,159
Mean of log(CD)	10.80	10.01	10.55
Ratio of PD to CD if both > 0:			
Mean	4.60	1.25	3.56
Standard deviation	24.70	2.91	20.61
Median	.49	.60	.51
Percent with PD:			
$1–$9,999	22.69	22.22	22.54
$10,000–$99,999	36.97	53.70	42.20
$100,000–$299,999	14.29	18.52	15.61
$300,000–$999,999	18.49	1.85	13.29
$1 million–$138 million	7.56	3.70	6.36

Note. The sample is composed of jury and bench trials in which the plaintiff won. PD = punitive damages; CD = compensatory damages.

fourth are bench trials. The probability of plaintiff success is .62 for bench trials and .47 for jury trials. These plaintiff success rates do not necessarily imply that judges are more plaintiff oriented than are juries. As discussed earlier, the mix of cases heard in each venue will depend both on the routing of cases to judges and juries as well as on which cases are settled and which are not. While judges and juries each have a .04 probability of awarding punitive damages, on average, jury awards are higher than bench awards. The mean punitive damages award is $1,816,031 for juries and $557,292 for judges.

5. PUNITIVE AND COMPENSATORY DAMAGES AWARDS

Table 2 presents more detailed information on damages awards for the sample of 4,336 trials in which the plaintiff won. Juries decided 68.5 percent of these trials, with judges deciding the remaining 31.5 percent. Compensatory damages were awarded in almost all trials in which the plaintiff prevailed (although there are five exceptions in which compensatory damages were zero). Punitive damages were awarded in 173 of the 4,336 trials in which the plaintiff won. Of these 173 trials, 119 were jury trials and the remaining 54 were bench trials.

As Table 2 reports, the mean punitive damages award level for juries is 3.3 times that for judges, while the median award level for juries is 1.5 times that for judges. The ratio of the mean of the log values is 1.05.[14] The larger disparity in mean values between jury and bench trials compared with the median and with the log values suggests that jury trials result in more punitive damages awards with high values.

Over the full sample of cases in which the plaintiff won, the compensatory damages awards show a pattern similar to that of punitive awards, with the mean compensatory award made by juries being 2.8 times the mean level for judges, the median jury award 1.8 times that for judges, and the ratio of the mean of the log values equal to 1.08.

The mean of the ratio of punitive to compensatory awards in cases in which both types of awards were made is 4.6 for juries and 1.25 for judges. But the median of this ratio is actually lower for juries. Comparing the means and median by type of trial indicates that juries award large punitive damages relative to compensatory damages more frequently than do judges. The standard deviation of the ratio of punitive to compensatory damages for juries is 8.5 times the standard deviation for judges, which indicates greater variability.

Much of the concern with respect to punitive damages pertains to the large-award outliers that are in the hundreds of millions or even in the billions of dollars. The distribution of awards reported at the bottom of Table 2 and illustrated in Figure 2 demonstrates that there are fairly few dramatic awards in this sample. Most of the punitive damages awards were small. Twenty-three percent of the awards were for less than $10,000, with judges and juries almost equally likely to make awards of this size. When legal reformers express alarm regarding punitive damages, these are not the awards that have generated concern.

Consider the upper end of the awards spectrum. Of the cases in which the plaintiffs received punitive damages awards ranging from $300,000 to $999,999, 18 percent of the jury cases awarded punitive damages in this range, while only 2 percent of the bench punitive damages awards were at this level. Similarly, 8 percent of punitive damages awards set

14. Here and throughout the paper we add $1 to damages amounts before calculating the logarithm.

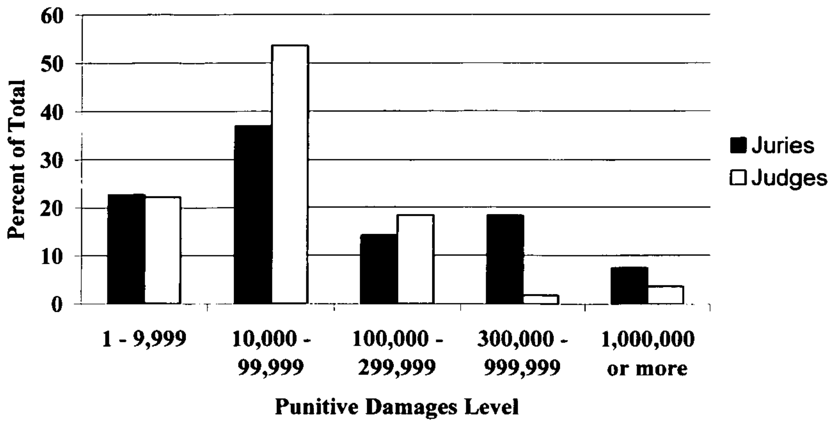

Figure 2. Distribution of jury and judge punitive damages awards

by juries were for at least $1 million, compared with 4 percent for judges. The largest punitive damages award in the state court sample is a jury verdict for $138 million. Thus, at the high end of awards, which are the main matter of concern, jury trials play a dominant role.

In our analysis of blockbuster awards, we estimated a simple regression of the relation between punitive and compensatory damages and found that jury punitive awards had no significant relation to compensatory awards. With only three bench awards in the blockbuster sample, we were not able to estimate the corresponding relation for judges' awards. The state courts data do allow us to estimate this relation for both jury trials and bench trials. Panel A of Table 3 presents regression results in levels, and panel B presents regression results in logs. As with the blockbuster sample, the only explanatory variable is the compensatory damages award. We find that compensatory awards are significantly related to punitive awards for both jury and bench trials. However, the explanatory power of the equations differs considerably between the two types of trials. The adjusted R^2 in panel A is .68 for judges but only .16 for juries, as differences in the compensatory award explain the roughly fourfold variation in punitive damages for judges compared with juries.

The log results in panel B compress much of the variation in damages levels. Punitive damages awards are again more predictable for bench trials than for jury trials, where the fraction of the log value of punitive

Table 3. Simple Regression Results for Punitive Damages Awards

	Jury	Bench
A. Punitive damages:[a]		
Compensatory damages	3.265**	.676**
	(.674)	(.063)
Constant	−137,796	−60,729
	(1,162,171)	(269,981)
Adjusted R^2	.16	.68
B. Log(punitive damages):[a]		
Log(compensatory damages)	.666**	.688**
	(.094)	(.082)
Constant	3.192**	2.879**
	(1.078)	(.886)
Adjusted R^2	.30	.57

Note. The sample is composed of jury (N = 119) and bench (N = 54) trials in which the plaintiff won and punitive damages were awarded. Standard errors are reported in parentheses.

[a] Dependent variable.

** The coefficient is significantly different from zero at the 1% level, two-sided tests.

damages explained by the regression is .57 for judges and .30 for juries. The practical consequence of using logarithms is to greatly compress the apparent variability of awards. The logarithm of punitive damages for the median award amount of $50,000 by juries is 10.8. Doubling the absolute value of the median award level increases it to $100,000. However, a doubling of the logarithm of the median punitive damages amount corresponds to an increase in the level of punitive damages to $2.4 billion. Analyzing the variability of awards when considering patterns of log values of punitive damages consequently may mask much of the variability of the level of punitive damages.

The log estimates in panel B of Table 3 provide a test of whether judges and juries perform in accordance with the optimal penalty model in Section 2. In each case, the slope coefficients are significantly less than the value of 1.0 that is predicted by equation (3).[15] Factors other than compensatory damages are influential.

While it is true that punitive damages award outliers contribute to greater unpredictability of jury awards, the existence of outliers that

15. If the coefficient on the log of compensatory damages had equaled 1.0, then the intercept term could be interpreted as providing an estimate of $\ln[(1-s)/s]$, where s is the probability of being found liable. The estimated intercepts imply a value for s of .04 for the jury cases and .05 for the bench trials. We thank the referee for calling these points to our attention.

cannot be predicted is precisely the matter of concern in debates over reform efforts to address the unpredictability of punitive damages. These findings indicate that unpredictable punitive damages for the sample of blockbuster jury awards are consistent with the pattern of jury behavior in a broader sample of cases.

6. EMPIRICAL SPECIFICATION AND DESCRIPTIVE STATISTICS

So far our analysis has examined the predictability of punitive awards from compensatory awards, conditional on a punitive award being made. We found that punitive awards are less reliably predicted from compensatory awards for awards made by juries than by judges. We now examine whether juries and judges differ in their propensity to make punitive awards and in the magnitude of these awards, controlling for differences in case mix and other characteristics. As before, we assume that punitive damages are awarded sequentially after compensatory damages rather than jointly. In Section 9, we examine whether juries and judges differ in their compensatory awards.

The Supreme Court has identified several factors that can be used to guide the level of punitive damages awards. These factors include the reprehensibility of defendant conduct, the ratio of compensatory to punitive damages awards, the defendant's financial status, and the legal environment, which includes civil and criminal penalties for similar conduct. In our analysis, we use proxies for these factors that are based on available data. The compensatory damages award is available within the data set. We proxy defendant conduct by case type. Intentional acts should have a greater likelihood of a punitive damages award than negligent acts. We use litigant pairs as a proxy for the defendant's financial status. Corporations typically have greater financial resources than do individuals. We control for county as a proxy for the legal environment. States differ in liability criteria and in damages rules, and counties differ in the demographic composition of juries and litigants.

Table 4 presents summary statistics for damages awards, litigant pairs, case types, and county. The columns present statistics for jury trials and bench trials for two groups: cases that the plaintiff won and cases that the plaintiff won and for which the plaintiff received a punitive damages award. For all cases in which the plaintiff won, the average compensatory damages award is $423,528 for jury trials and $152,344 for bench trials. Judges awarded higher compensatory awards than did

Table 4. Sample Characteristics of Jury and Bench Trials (Mean or Percent)

	Plaintiff Win		Plaintiff Win with Punitive Award	
	Jury	Bench	Jury	Bench
Damages ($):				
Punitive damages	72,715	22,063	1,816,031	557,292
	(2,610,079)	(684,167)	(12,974,300)	(3,425,466)
Compensatory damages	423,528	152,344	598,497	914,111
	(1,868,729)	(982,626)	(1,625,066)	(4,196,590)
Litigant pair (%):				
Individual versus individual	38.19	26.25	33.61	37.04
Individual versus hospital, corporation, or government	52.02	28.01	57.14	42.59
Individual and nonindividual versus hospital, corporation, government, or individual	3.20	4.40	3.36	5.56
Nonindividual versus hospital, corporation, government, or individual	6.59	41.35	5.88	14.81
Case type (%):				
Tort cases:				
Motor vehicle accident	46.47	10.12	9.24	1.85
Premises liability	14.74	4.62	4.20	12.96
Asbestos, breast implant, or other products liability	3.20	.88	3.36	1.85
Intentional act	3.77	3.01	20.17	18.52
Medical or professional malpractice	6.76	1.91	2.52	.00
Slander, libel, or defamation	.57	.37	2.52	.00
Other negligent act	4.85	2.27	2.52	1.85

Contracts and commercial cases:				
Fraud	3.33	6.89	12.61	22.22
Seller and buyer plaintiff	8.24	48.02	14.29	18.52
Employment discrimination or other employment dispute	3.67	3.81	17.65	9.26
Mortgage foreclosure, rental/lease agreement, intentional/tortious interference, or other contract dispute	4.07	16.72	8.40	11.11
Real property cases:				
Eminent domain/condemnation, title or boundary dispute, or other real property issue	.34	1.39	2.52	1.85
Counties (%):				
Bergen, New Jersey	2.49	2.79	4.20	3.70
Cuyahoga, Ohio	2.73	3.67	2.52	3.70
DuPage, Illinois	2.05	2.20	3.36	3.70
Harris, Texas	2.05	7.11	3.36	22.22
Los Angeles, California	4.07	5.35	13.45	3.70
Middlesex, New Jersey	2.05	1.25	1.68	5.56
Orange, California	3.06	7.11	7.56	12.96
Pima, Arizona	1.62	2.05	1.68	3.70
St. Louis, Missouri	2.09	2.05	2.52	5.56
Ventura, California	1.31	1.54	2.52	3.70
Other counties	76.48	64.88	57.14	31.48
Number of observations	2,972	1,364	119	54

Note. Standard deviations are reported in parentheses.

juries in cases in which punitive damages were awarded, with mean values of \$598,497 in jury trials and \$914,111 in bench trials.

The survey reports very narrowly defined litigant types for both plaintiffs and defendants, allowing 12 options for each plaintiff and defendant type for up to eight plaintiffs and eight defendants. Most pairs of litigant types have few observations, so we group cases into four major categories of individual versus individual; individual versus hospital, corporation, or government; individual and nonindividual versus hospital, corporation, government, or individual; and nonindividual versus hospital, corporation, government, or individual. As Table 4 indicates for the sample of cases in which the plaintiff won, 38 percent of cases heard by a jury involved individual plaintiffs suing other individuals and 52 percent involved individuals suing hospitals, corporations, or government. In contrast, only 26 percent of bench trials involve individuals suing individuals, and 28 percent involve individuals suing hospitals, corporations, or government. While 7 percent of jury cases dealt with lawsuits on behalf of nonindividuals, 41 percent of judges' cases involved disputes with nonindividual plaintiffs. Few cases had both individual and nonindividuals as plaintiffs and defendants for either bench or jury trials.

The survey allows reporting of 22 case type codes, which are grouped under the broader categories of tort, contract and commercial, and real property. As with litigant pairs, several of the codes have few observations, so we group cases into 12 broader categories. These groupings, reported in Table 4, include seven tort categories: motor vehicle accident; premises liability; asbestos, breast implant, or other products liability; intentional act; medical or professional malpractice; slander, libel, or defamation; and other negligent act. There are four contract and commercial case categories: fraud; seller and buyer plaintiff; employment discrimination or other employment dispute; and mortgage foreclosure, rental/lease agreement, intentional/tortious interference, or other contract dispute. The final grouping is the much smaller category of real property cases that includes eminent domain/condemnation, title or boundary dispute, and other real property issue.

As Table 4 demonstrates, among trials in which the plaintiff wins, the types of cases faced by juries and judges are distributed in a manner consistent with the types of litigants. To generalize, juries see a far larger share of tort cases, in which the plaintiff is usually an individual, and judges see a far larger share of contract and real property cases, which more often involve businesses. Juries are more likely to encounter cases involving motor vehicle accidents, premises liability, products liability, and medical malpractice cases. Almost half of all jury trials in which the plaintiff won are motor vehicle accident cases, compared with only 10 percent for judges. In contrast, bench trials play a dominant role for many of the financial transaction cases, such as those in which the buyer or seller is a plaintiff or there is a mortgage foreclosure. Nearly half of the bench trials in which the plaintiff won are cases involving either a buyer or seller plaintiff, compared with 8 percent for juries.

In order to control for possible county-specific effects, we define a set of indicator variables. Most of the 45 counties included in the data set had few cases in which there was a punitive damages award. Indeed, eight counties had no trials awarding punitive damages. In the main results presented in the tables, we defined indicator variables for each county that contributed at least two each of jury and bench trials to the sample with positive punitive damages. We thereby define 10 such indicator variables. The 10 counties account for 42.9 percent of the trials in which juries awarded punitive damages and 68.5 of the trials in which judges awarded punitive damages. We also estimate equations with indicator variables for all counties. As we discuss later, the results are sensitive to controlling for Harris County but are not substantially affected otherwise by the number of county indicator variables in the specification.

7. THE DETERMINANTS OF PUNITIVE DAMAGES AWARDS

It is evident from Table 4 that judges and juries see different types of cases. Our empirical analysis controls for many of these case characteristics and other factors that influence the type of trial. We initially treat the trial forum as exogenous to the punitive awards decision. We then test for potential self-selection effects in which the parties' choice of trial forum may bias the jury effect. Our analysis indicates that any bias that may arise from assuming the trial forum is exogenous is at most minor and gives credence to the assumption that trial forum is exogenous within the sample analyzed here. For that reason, we focus in this paper on the results without the selection correction.

Table 5 reports the results of estimating the determinants of punitive damages under two approaches. First, we present estimates of the magnitude of punitive awards.[16] Because of the large number of zero values

16. A recent analysis of punitive damages awards is Karpoff and Lott (1999), which uses a sample of cases compiled by searching for "punitive" in the LexisNexis library, restricted to publicly traded corporate defendants. The study does not distinguish between jury and judge trials.

Table 5. Tobit and Probit Estimates of Punitive Damages Awards

	Tobit (1)			Probit (2)		
	Coefficient	Standard Error	Marginal Effect[a]	Coefficient	Standard Error	Marginal Effect[a]
Explanatory variables:[b]						
Jury trial	4.777**	1.875	.090	.256**	.100	.011
Log(compensatory damages)	1.081**	.377	.023	.047*	.020	.002
Litigant pair:						
Individual versus individual	12.650**	2.825	.363	.666**	.145	.041
Individual versus hospital, corporation, or government	9.891**	2.702	.233	.515**	.141	.027
Individual and nonindividual versus hospital, corporation, government, or individual	6.357	4.351	.193	.325	.233	.021
Case type:						
Premises liability	8.435**	3.315	.269	.456**	.175	.031
Asbestos, breast implant, or other products liability	15.372**	4.690	.817	.806**	.247	.082
Intentional act	31.981**	3.582	4.081	1.740**	.160	.334
Medical or professional malpractice	1.630	4.861	.037	.096	.262	.005
Slander, libel, or defamation	26.330**	6.948	2.715	1.414**	.359	.237

Other negligent act	7.969	4.682	.266	.415	.251	.029
Fraud	28.073**	3.605	2.896	1.505**	.169	.250
Seller and buyer plaintiff	16.812**	3.105	.707	.882**	.157	.074
Employment discrimination or other employment dispute	28.841**	3.704	3.146	1.528**	.174	.260
Mortgage foreclosure, rental/lease agreement, intentional/ tortious interference, or other contract dispute	20.507**	3.529	1.319	1.073**	.176	.125
Eminent domain/condemnation, title or boundary dispute, or other real property issue	26.735**	6.313	2.807	1.409**	.329	.235
Constant	−75.958**	7.270		−3.900**	.284	
Log likelihood	−1,147			−578		

Note. The sample is composed of jury and bench trials in which the plaintiff won. $N = 4{,}336$.

[a] Marginal effect of a 1-unit change in each of the explanatory variables.

[b] Also included in the regression equations are 10 indicator variables that represent the counties listed in Table 3.

* The coefficient is significantly different from zero at the 5% level, two-sided tests.

** The coefficient is significantly different from zero at the 1% level, two-sided tests.

for punitive damages, we use tobit regression. Tobit regression simultaneously takes into account the likelihood of a nonzero punitive damages award and the magnitude of the award if positive. The dependent variable takes on the value of the punitive award if the award is positive and zero otherwise, and the estimating procedure adjusts for the probability of a zero award in calculating the regression coefficients. Second, we use probit regression to present estimates of whether there is a difference between juries and judges in the probability of making an award. The dependent variable is equal to one if a punitive award is made and is zero otherwise.

As Table 2 and Figure 2 made clear, the distributions of punitive awards and compensatory awards are highly skewed. Both tobit and probit regressions are highly sensitive to the assumption of normality. Tests on the levels of punitive and compensatory damages lead to a rejection of the assumption of normality. Tests on the logs of these damages values demonstrate that one cannot reject the assumption of normality of punitive damages in the tobit regression.[17] The results presented in the following tables use the logs of the damages awards, as in equation (3) of Section 2.

Table 5 reports both the original tobit or probit coefficients, associated standard errors, and estimates of the marginal effect of a 1-unit change in each of the explanatory variables. Both equations control for the same set of variables. Each equation includes an indicator variable equal to one for a jury trial, the log of compensatory damages, and indicator variables for three types of litigant pairs, 11 case types, and 10 counties. The omitted litigant pair category is nonindividual versus hospital, corporation, government, or individual. We expect cases with individual plaintiffs to fare better in terms of punitive awards relative to the omitted category, particularly when the defendant is not also an individual. The omitted case type category is motor vehicle accident. Because motor vehicle tort cases generally are routine insurance cases, we expect other case types to be associated with higher punitive awards, especially those involving intentional acts.[18]

17. A conditional moment test of the null hypothesis of normal errors yields a p-value of .09.

18. In alternative specifications, we controlled for whether the trial occurred in a state that had a punitive damages cap in place. The damages cap variable was never statistically significant and is consequently not included. We also estimated equations controlling for the year in which the case was filed. The year indicators were never statistically significant, either individually or jointly, and are likewise not included in the results reported here.

Before discussing the magnitude of the effects, it is useful to give an overview of the findings. Both equations demonstrate a positive effect of a jury trial on punitive awards, statistically significant at the 95 percent level in the tobit estimates and at the 99 percent level in the probit estimates. Cases with high compensatory awards are associated with greater punitive awards. Among the litigant pairs, cases with individual plaintiffs fare better relative to the omitted group of cases with nonindividual plaintiffs. Relative to motor vehicle cases, all case types except medical and professional malpractice and the catchall category of "other negligent acts" are associated with higher punitive damages awards.

To interpret the magnitude of the coefficients, it is useful to calculate the marginal effect of the variables evaluated at the mean values of the independent variables. For the tobit estimates, we report the marginal effects on log punitive awards for the entire sample including those in which a punitive award was not made. The marginal effect of a jury trial is .09, representing 21 percent of the mean value of the log of the punitive damages variable for the full sample, which is .42. The probit estimates indicate that jury trials have a .011 greater probability of a punitive award. Since the overall probability of a punitive award is .04, the magnitude of the jury effect on the probability of an award is 28 percent.

The expectation that intentional acts will have a greater impact on punitive damages is supported by the results. For example, the probit estimates indicate that relative to the omitted category of motor vehicle cases, the marginal effects of a punitive award being made are .33 for intentional acts, .26 for employment discrimination or other employment disputes, .25 for fraud, .24 for real property cases, and .24 for slander, libel, or defamation.

As we discussed in Section 2, Hersch (2003) shows that choice of trial forum influences the probability of trial, with cases demanding jury trial being more likely to settle. However, in addition to the effect of trial forum on settlement, there may be an additional effect of trial forum on punitive damages owing to selection of trial forum. To examine whether the estimated effects of a jury trial reported in Table 5 are biased because of sorting into trial type on the basis of expected outcomes, we estimate a treatment effects model to control for self-selection of type of trial (see, for example, Greene 2003, pp. 787–89). This procedure is an extension of the standard Heckman selection model. In the basic Heckman model, the dependent variable is observed only for the self-selected subsample. In the current situation, there is selection in the choice of forum, but the trial outcome is observed for both bench trials and jury trials. As in the standard Heckman selection model, the treatment effects procedure includes in the punitive damages equation a selection correction term (inverse Mills ratio) calculated from a probit for choice of forum.

We expect the type of trial selected to be a function of the number and characteristics of litigants who are eligible to choose the trial type, the expected costs of each forum, and the expected difference in damages amounts by type of trial. The data set includes information on the number of plaintiffs, defendants, pro se plaintiffs, and pro se defendants. More litigants should increase the likelihood that at least one party requests a jury trial. Pro se participants should prefer bench trials to jury trials. We proxy the expected costs of each forum by the predicted time from filing to verdict. Using the full data set, we estimated predicted time to verdict for bench trials and for jury trials as a function of detailed case type (22 case types), county (45 counties), and year of filing. Other variables, such as the damages request and information on the parties' expectations, were not available in the data set.

The results of the first-stage regression predicting trial type indicated that the choice of jury trial is inversely related to the number of pro se plaintiffs and the number of pro se defendants, where these effects are significant at the 99 percent level. The coefficients for predicted time to verdict for bench trials and the total number of defendants were positive and marginally significant, with p-values of .16 and .13, respectively. The coefficients for predicted time to jury trial and the total number of plaintiffs were not significant at any reasonable level.

Using the sample of cases in which the plaintiff won, we estimated two second-stage punitive damages equations. In one equation, the dependent variable is the log of punitive awards. The other equation is a linear probability regression of whether a punitive award was made.[19] In both equations, the jury coefficients remained positive, with p-values of .09.[20] Consistent with our earlier discussion of selection effects, we find evidence that the effect of jury trial on punitive damages is understated. The magnitudes of the jury coefficients are higher in the equations that correct for selection than in their non-selection-corrected counter-

19. We estimated these equations using the "treatreg" procedure in Stata 7.0.

20. In the log-punitive-awards equation, the coefficient on the jury variable is .354, with a standard error of .209. In the linear probability equation, the coefficient on the jury variable is .033, with a standard error of .019.

Table 6. Quantile Regression Results for Punitive Damages Awards

Explanatory Variables	.10	.25	.50	.75	.90
Jury trial	−.706	−.249	−.019	.481	.924*
	(.527)	(.223)	(.230)	(.357)	(.443)
Log(compensatory damages)	.912**	.830**	.866**	.642**	.446*
	(.105)	(.081)	(.107)	(.190)	(.220)
Constant	−.789	.587	.945	4.211	6.957**
	(1.417)	(.916)	(1.202)	(2.155)	(2.462)

Note. The sample is composed of jury and bench trials in which plaintiff won and punitive damages were awarded (173 observations). The dependent variable is log(punitive damages). Column headings indicate the quantile. Bootstrap standard errors are in parentheses.
* The coefficient is significantly different from zero at the 5% level, two-sided tests.
** The coefficient is significantly different from zero at the 1% level, two-sided tests.

parts.[21] Furthermore, the test of the null hypothesis that the forum choice equation and the punitive damages equation are independent could not be rejected in either specification.[22] This independence therefore implies that, at least for this sample of cases, selection does not bias the estimated effect of a jury trial on punitive damages awards.[23]

8. QUANTILE REGRESSION ESTIMATES

A principal implication of the compilation of large-award cases in Table 1 was that for the very big punitive damages awards of at least $100 million, juries play a dominant role. While there is only one award of this magnitude in the 1996 state court sample, we now use the state court data to examine whether the role of juries with respect to punitive damages awards is particularly great in large-award cases. As the descriptive statistics in Table 2 suggest, any disparities between juries and judges appear more likely to arise at the high punitive damages level.

21. In the log-punitive-awards equation that does not allow for selection, the coefficient on the jury variable is .241, with a standard error of .086. In the linear probability equation that does not allow for selection, the coefficient on the jury variable is .022, with a standard error of .008.

22. The p-value for the test of independence is .58 for the log-punitive-damages equation and .55 for the linear probability equation.

23. Helland and Tabarrok (2000) control for selection of trial type, also among cases tried to verdict, and find that total damages in personal injury cases are higher when awarded by a jury than by a judge, although most of the difference in average awards between jury and judge trials is due to differences in case mix.

To explore this variation in awards, Table 6 presents quantile regressions for five different percentiles.[24]

Because quantile regressions focus on determinants of damages for particular quantiles, taking into account the likelihood of being in the quantile, there are severe limits to the number of variables that can be included in the specification when using a sample of the size available in this data set. We focus on equations including only a constant term, the log of compensatory damages, and whether there is a jury trial.

The quantile regressions make it possible to analyze how the coefficients of these variables differ across the distribution of punitive damages. Interestingly, from the 10th percentile through the 75th percentile of these awards, the influence of jury trials on the level of punitive damages is not statistically significant. However, at the 90th percentile there is a positive and statistically significant effect of jury trial on the level of punitive damages awards. The jury effect is most consequential among the large awards. The incremental jury effect is consequently not uniform across the entire spectrum of awards but instead is concentrated among large awards.

It is unclear how the relation between compensatory and punitive awards should differ across the quantiles. The blockbuster cases indicated no relation between compensatory and punitive awards, although over the broader spectrum of cases in the state court data we find a significant relation. Our quantile results indicate a weaker relation between compensatory and punitive awards at higher award levels, as the coefficients at the 90th percentile and the 75th percentile are the smallest in the table.

9. COMPENSATORY DAMAGES LEVELS

A consistent finding throughout the analysis of the state court data is that the level of compensatory damages for a particular case is a significant determinant of whether there is a punitive damages award and, if so, the magnitude of the award. Virtually all of the successful plaintiffs in this survey of civil trials were awarded compensatory awards. A com-

24. Rather than minimize the sum of squared residuals as in ordinary least squares regression, quantile regression minimizes the sum of absolute residuals. The quantile equations correspond to different portions of the punitive damages distribution on the basis of the error in predicting the awards levels. Thus, the estimates for the .90 quantile yield coefficients so that 90 percent of the residuals are negative and 10 percent are positive. It will generally be the large awards that will be at this upper quantile.

Table 7. Regression Results for Log Compensatory Damages Awards

Explanatory Variables[a]	Coefficient	Standard Error
Jury trial	.980**	(.077)
Litigant pair:		
Individual versus individual	−.960**	(.101)
Individual versus hospital, corporation, or government	−.024	(.098)
Individual and nonindividual versus hospital, corporation, government, or individual	.022	(.168)
Case type:		
Premises liability	.633**	(.102)
Asbestos, breast implant, or other products liability	1.573**	(.190)
Intentional act	.149	(.159)
Medical or professional malpractice	1.829**	(.134)
Slander, libel, or defamation	−.344	(.400)
Other negligent act	.952**	(.151)
Fraud	.663**	(.149)
Seller and buyer plaintiff	.370**	(.102)
Employment discrimination or other employment dispute	.797**	(.160)
Mortgage foreclosure, rental/lease agreement, intentional/tortious interference, or other contract dispute	.450**	(.126)
Eminent domain/condemnation, title or boundary dispute, or other real property issue	.363	(.352)
Constant	9.740**	(.120)
Adjusted R^2	.18	

Note. The sample is composed of jury and bench trials in which plaintiff won (4,336 observations).

[a] Also included in the regression equations are 10 indicator variables that represent the counties listed in Table 3.

** The coefficient is significantly different from zero at the 1% level, two-sided tests.

plete assessment of differences between judges and juries in awarding punitive damages must also take into account differences in their determination of compensatory damages awards for these cases. In this section, we examine whether jury trials are more likely to lead to higher compensatory damages awards by controlling for case characteristics.

Table 7 reports estimates of the logarithm of compensatory damages against the control variables that have been included in the previous analyses. Jury trials are associated with higher levels of compensatory damages even after taking into account these other variables pertaining to the parties involved, case type, and the county location. The only litigant pair variable that has a significant effect on compensatory damages is individual plaintiff versus individual defendant cases, which has a negative influence relative to nonindividual plaintiffs. Case types that did not have a powerful effect on punitive awards nevertheless have a large influence on compensatory damages. Particularly noteworthy in this regard are the large incremental damages amounts for medical or professional malpractice, other negligent act, and asbestos, breast implant, or other products liability. While these and other determinants of damages differ greatly in their influence on compensatory and punitive damages, one consistent influence is the positive effect of jury trials on both types of awards.

10. SENSITIVITY TESTS AND COMPARISON WITH THE EISENBERG ET AL. RESULTS

The results presented here are based on the same state court data set used in the Eisenberg et al. (2002) study, yet they yielded contradictory findings. Eisenberg et al. find no jury effect on punitive damages awards; we find a consistent and statistically significant influence. In this section, we consider alternative specifications. Doing so provides information on the robustness of our findings and identifies the sources of disagreement with the Eisenberg et al. findings. Specifically, we compare the specification used in our probit results reported in column 2 of Table 5 with the logistic results of Eisenberg et al. reported in their table 3. We note that although the following discussion reports the consequences of changing one assumption at a time, we estimated all of our models using every possible combination of alternative assumptions. The results are consistent with those reported below.

Table 8 summarizes the sensitivity tests and identifies the essential causes of the disparity.[25] As the following discussion demonstrates, Eisenberg et al.'s results are sensitive to the treatment of Harris County trials in their analysis and to their inclusion of two highly correlated jury variables. The other differences in specification, such as number of litigant pair categories, number of case type categories, adjustment for sampling weights, or adjustment of the standard errors for clustering, are not responsible for the disparity.

Working through these possibilities one by one, it should first be noted that Eisenberg et al. estimate logistic equations and present odds ratios; we estimated probit equations. Preliminary analyses yielded the unsur-

25. For brevity, we do not present alternative specifications for our tobit results, but these follow a pattern similar to the probit estimates.

Table 8. Sensitivity of Jury Effects to Alternative Specifications of the Punitive Damages Award Equation

Specification	Jury Coefficient	Standard Error
Reference point probit results	.256**	(.100)
Logistic odds ratio model	1.722**	(.358)
Detailed litigant pairs	.274**	(.100)
Detailed case types	.214*	(.101)
Clustering at county level	.256*	(.126)
Sampling weights	.180	(.109)
Full set of county dummy variables	.238*	(.107)
Influence of Harris County:		
No county dummy variables	.135	(.096)
Harris County dummy variable only	.225*	(.097)
Harris County excluded, no county dummy variables	.287**	(.103)
Harris County excluded, county dummy variables included	.324**	(.106)
Harris County excluded, county dummy variables and weights included	.351**	(.116)
Harris County only	−.504	(.430)

Note. All equations are identical to the reference point equation in Table 5, column 2, except as indicated. The dependent variable is one if there was a punitive damages award and zero otherwise. Standard errors are reported in parentheses.

* The coefficient is statistically significant from zero at the 5% level, two-sided tests.

** The coefficient is statistically significant from zero at the 1% level, two-sided tests.

prising conclusion that none of the differences arise from the use of logistic rather than probit regression; the following discussion reports probit coefficients as we successively consider the impact of replacing Eisenberg et al.'s specification with that employed in our main analysis.

Now consider the controls for litigant pairs and for case types. Given the relatively small number of punitive awards and the fact that, as demonstrated in Table 4, certain types of litigant pairs and certain types of cases are disproportionately likely to be heard by either a judge or a jury, controlling for more rather than fewer litigant pairs or types of cases may induce correlations that further mask the effect of type of trial. For example, judges did not award punitive damages in any cases of medical or professional malpractice or slander, libel, or defamation. However, as we now discuss, substituting Eisenberg et al.'s categories for ours does not change our finding of a statistically significant jury effect.

Our analysis groups litigant pairs into four categories, in contrast to the eight litigant pairs used by Eisenberg et al. The jury coefficient remains statistically significant at the 99 percent confidence level when substituting Eisenberg et al.'s litigant pairs for ours. As for case types, we group case types into 12 categories, in contrast to the 17 categories used by Eisenberg et al. Using their narrower classification of case types again does not alter the statistical significance of the jury variable or its magnitude, which continues to imply a .01 higher probability of a punitive damages award if awarded by a jury.

Since multiple trials occurred in each of the 45 counties represented in the sample, Eisenberg et al. adjusted the standard errors for the possibility that the error terms for observations within counties are correlated with each other. This adjustment for within-county clustering assumes that the error terms for observations between counties are independent.[26] The adjustment for clustering will not affect the coefficient, but it usually increases the standard errors, and in doing so, it may lower the significance level of coefficients. Nonetheless, using our basic specification, adjusting for clustering does not change the statistical significance of our jury coefficient.

Because the sampling procedure captured a different share of trials in different counties, the survey provides sampling weights. Estimation using sampling weights results in the jury coefficient dropping to the 90 percent level of significance. The large sampling weight given to Harris County leads to this result for reasons we now address.

As discussed earlier, our basic specification controls for 10 county indicator variables. As Table 8 indicates, the statistical significance and magnitude of the jury indicator are not affected by controlling for all 45 counties.[27] However, exclusion of all county indicators reduces the magnitude and significance of the jury effect. This reduction in the jury effect can be traced to the failure to account for the influence of Harris County.

Harris County, Texas, is an aberration among the counties in several ways.[28] First, Harris County had more trials than any other county and is the county most affected by the sampling procedures. Only 352 of the county's 1,500 trials were included in the sample, which is reflected in Harris County having the largest sample weight. Second, the largest

26. If the error terms for observations within a given state are correlated, this assumption of independence between counties will not hold, and the adjustment for clustering gives misleading standard errors.

27. No punitive damages were awarded in eight counties. As there is no variation in awarding punitive damages, observations in these eight counties are dropped by the probit model.

28. This information is reported in the data documentation of U.S. Department of Justice (2001; 1999, pp. 23, 10).

punitive award in the sample, $138 million, was a jury verdict for a trial in Harris County.

Third, and most important, Harris County had by far the largest number of trials in which a judge awarded punitive damages. Of the 54 bench trials in the sample in which punitive damages were awarded, 12 of these awards occurred in Harris County. Indeed, the Bureau of Justice Statistics estimates that for the set of all trials in the 45 counties, bench trials in Harris County awarded punitive damages in 67 trials, which exceeds the projected total of 46 punitive awards in bench trials in all of the other 44 counties combined. In contrast, juries in Harris County were not markedly different than juries in other counties in their propensity to award punitive damages. Only four of the 119 jury punitive awards were made in Harris County. As the regression results demonstrate, unless the equation includes a control for Harris County, the significance of the jury effect is diluted by the large number of bench punitive awards relative to jury punitive awards within a county that contributes a large number of observations to the sample.

The final five jury coefficients reported in Table 8 identify how Harris County influences the results. Simply including an indicator for Harris County but for no other counties is sufficient to raise the jury coefficient and significance back to levels comparable to the basic specification. Indeed, excluding all Harris County observations results in even larger estimates of the jury coefficient, whether or not county indicators are included in the equation and whether or not sampling weights are used. The reason for the difference in the magnitude is clear from the results estimated for Harris County alone. These results demonstrate that juries within this large county are less likely than judges to award punitive damages, although this effect is not statistically significant at conventional levels, with a p-value of .135.

A final difference not reported in Table 8 is that Eisenberg et al.'s specification controlled for both a jury indicator variable as well as the interaction of jury trial with the log of compensatory damages. Inclusion of these two terms in our specification indicates that both the jury coefficient and the coefficient on the interaction term are not significantly different from zero.[29] Inclusion of this interaction term allows the effect of compensatory awards on the probability of making a punitive award to differ between judges and juries. But since the inclusion of two such

29. The coefficient (and standard errors) on the jury indicator and the jury–log compensatory interaction are .686 (.459) and −.041 (.042), respectively.

highly correlated jury variables raises the risk that the significance of the jury coefficient will be affected by multicollinearity, it is important to test whether the interaction term is appropriately included in the equation. Indeed, although neither coefficient is individually statistically significant, a test of the null hypothesis that jointly these jury coefficients are not statistically significant results in a *p*-value of .02, which indicates that in combination, juries have a statistically significant effect on the probability of awarding punitive damages. Given this test, inclusion of the interaction term serves only to induce multicollinearity with the jury term.

11. CONCLUSION

Large punitive damages awards garner headlines and attract controversy. To assess whether judges exercise more restraint than juries in making punitive damages awards, we began with a comprehensive survey of all punitive damages awards of at least $100 million. This world of blockbuster awards is almost exclusively the province of juries, which are responsible for 95 percent of these awards. These blockbuster awards are not correlated with compensatory damages awards.

Our analysis then considered data from the *Civil Justice Survey of State Courts, 1996*. Examination of the level of punitive damages awards for all cases shows that juries award higher levels of punitive damages than do judges. Juries also have a higher probability of awarding punitive damages. Moreover, juries are especially likely to make a large punitive damages award conditional on a punitive damages award being made. Thus, juries are more prone to generate large awards than are judges.

The ultimate economic impact of these punitive awards is affected by settlements, reductions, and reversals. Nevertheless, the initial magnitude of the award is likely to exert an influence on litigation outcomes. First, the existence of a large punitive award will affect the bargaining power of the parties in the post-trial settlement process, theoretically leading to higher settlement amounts. Second, defendants may also seek to settle similar cases to avoid risking punitive damages. Third, even if awards are reduced, it is possible that large punitive damages awards have an anchoring effect in the appeals process, leading to a higher award after the appeal. Fourth, the appeals process is costly, and higher stakes make it desirable to spend more on the appeal. And finally, some awards are not reduced or overturned. While our analysis does not provide an assessment of the economic ramifications of punitive damages, it does show a difference in the behavior of judges and juries.

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