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Abstract

We study litigation costs for personal injury tort claims in Texas over 1988-2004, relying on a detailed source of case-level data on defense legal fees and expenses, and Texas state bar data on lawyers' hourly rates. We study costs in medical malpractice cases in detail, and costs in other types of cases in less detail. Controlling for payouts (which are roughly flat), real defense costs in medical malpractice cases rise an estimated 4.6% per year, roughly doubling over this period; the rate of increase is similar for legal fees and for other expenses. Real hourly rates for personal injury defense counsel are flat, so rising rates cannot explain this increase. Costs correlate strongly with payouts. Medical malpractice insurers predominantly used outside counsel, occasionally used inside counsel, and rarely used both in the same case. Surprisingly, medical malpractice insurers did not react to the sustained rise in defense costs by adjusting their expense reserves, which did not increase either in real dollars or relative to reserves for indemnity payouts, and declined substantially as a percentage of defense costs.

In other types of commercially insured tort litigation (auto, general commercial, multi-peril, and other professional liability), defense costs rose more moderately by an estimated 2.2% per year. Defense costs are predicted by the same factors as in medical malpractice cases. However, insurers in these other lines of coverage responded to increasing defense costs by adjusting their expense reserves.

Rising defense costs imply a decline in the "efficiency" of litigation, at least as measured by transaction costs – with the steepest declines in medical malpractice cases. However, the time needed to resolve claims also declined in medical malpractice, other professional liability, and general commercial cases; on this measure, tort system performance improved.

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I. Introduction

Tort litigation is expensive. Plaintiffs recover only a fraction of what defendants and their insurers spend; legal fees and expenses and indirect insurer costs account for the rest. But little is known about the factors that affect tort litigation costs, and the components of those costs. How much goes to defense lawyers? How much goes to other direct expenses? Are costs changing over time? What case-level factors predict defense costs? To what extent do insurers rely on inside ("staff") counsel versus outside counsel? Do the answers to these questions vary depending on the type of case? We begin to answer these questions in this article. We focus on medical malpractice, but also present evidence on four other types of personal injury cases covered by commercial lines of insurance.

We employ a unique Texas Department of Insurance (TDI) database of all closed, commercially insured Texas claims for bodily injury from 1988-2004 with payout over $25,000.[1] This database covers five lines of commercial insurance: auto, general commercial, multi-peril, medical malpractice professional liability, and other professional liability.[2] A contemporaneous paper by Joni Hersch and Kip Viscusi also relies on this database. Hersch and Viscusi study defense costs in all types of personal injury litigation at a fairly general level. In contrast, we study defense costs in medical malpractice cases in detail and emphasize different aspects of the litigation process.[3] We supplement the TDI database with data on defense lawyers' hourly rates from 1989-2005, based on periodic Texas bar surveys. All dollar amounts in this article are in 1988 dollars, unless otherwise specified.

Our principal findings are as follows.

For medical malpractice cases:

- Inflation-adjusted defense costs rose at 4.6% per year (5.1% after controlling for payouts and a variety of other factors that predict defense costs). By the end of our sample period, total defense costs equaled 18% of total payouts and annual defense costs were running at about $150 million (in 2007 dollars).

[1] Unless otherwise indicated, all dollar amounts in this paper are in 1988 dollars; computed using the Consumer Price Index for All Urban Consumers (annual average) as a price index. Source: www.bls.gov/cpi/. To convert to 2006 dollars, multiply by 1.71. To convert to 2004 dollars, to compare our results to Hersch & Viscusi (2007), multiply by 1.60; to convert to 2007 dollars, multiply by **[1.xx]**.

[2] This paper is one of a series based on the Texas database. Other papers are Black, Silver, Hyman & Sage (2005) (trends in overall payouts, referred to below as *Stability, Not Crisis*); Hyman, Black, Zeiler, Silver & Sage (2007) (comparing jury verdicts with actual payouts, referred to below as *Jury Verdicts*); Zeiler, Silver, Black, Hyman & Sage (2007) (physician policy limits and out-of-pocket payments, referred to below as *Policy Limits*); and Hyman, Black, Silver, and Sage (2007) (effect of caps on non-economic damages on payouts).

[3] Hersch & Viscusi (2007).

- The rate of increase is similar for legal fees and for other out of pocket costs. Legal fees account for 77% of total defense costs; other loss allocation expenses (expert witness fees, depositions, copies of medical records, court costs, and the like) average 23% of total defense costs.
- We are able to rule out a number of possible explanations for rising defense costs, including rising exposure (proxied by payouts and policy limits), rising hourly rates for defense counsel, longer time to resolve cases, and more cases going to trial. The rising costs remain unexplained.

Factors affecting medical malpractice defense costs and insurer reserves for these costs:

- Sensibly, insurers' defense costs rise with payout, policy limits, the existence of two or more defendants, the number of defendants, the stage at which the case is resolved, and the length of time the case is open.
- Insurers rely primarily on outside counsel. One medical malpractice insurer experimented with inside counsel for much of our sample period, but abandoned the experiment around 2000. Outside counsel account for 99% of total counsel expense in 2003-2004.
- Initial expense and indemnity reserves are poor predictors of eventual cost.
- Puzzlingly, insurers failed to increase their initial reserves to reflect the rise in defense costs, producing a decline over time in the ratio of initial expense reserves to defense costs.

Comparing medical malpractice to other types of commercially insured personal injury cases:

- Non-medical malpractice cases cost less to defend. Defense costs in such cases also rose, but more slowly (2.2% per year).
- Insurers' defense costs in other areas rise with the same factors that predict defense costs in medical malpractice cases. In areas other than medical malpractice, outside counsel account for 94-97% of defense counsel expense, with greater use of inside counsel in smaller cases, and a modest trend toward greater use of inside counsel over time.
- In contrast to medical malpractice, insurers in the other four lines of coverage increased their expense reserves to reflect the rise in defense costs; initial reserves were also better predictors of eventual payouts and defense costs.

The principal surprises in this research are: (i) the secular rise in defense costs, especially in medical malpractice; (ii) the failure of medical malpractice insurers (but not other insurers) to adjust their expense reserves to reflect expected costs; and (iii) the limited ability of medical malpractice insurers to predict actual defense costs when they establish initial reserves. Many of our other findings are consistent with sensible insurer behavior. For example, insurers invest more in cases with larger exposure, and spend more the further along the case gets and the longer it lasts.

Part II describes previous studies of tort litigation costs. Part III describes our datasets. Part IV outlines our basic findings on defense costs in medical malpractice cases. Part V compares defense costs in medical malpractice cases to costs in other types of litigation. Part VI

discusses possible explanations for rising defense costs. Part VII discusses some implications of our findings. Part VIII concludes.

II. Past Research on Tort Litigation Costs

Estimates of the overall cost of medical malpractice litigation, including legal fees and expenses for plaintiff and defendant, plus insurers' administrative costs, typically exceed 50% of the total premium dollars collected by insurers.[4] However, the estimates are often partly or entirely anecdotal, or based on other (anecdotal) estimates. Moreover, studies frequently use different definitions of the sample, the numerator, and the denominator.[5] We focus in this review on the limited quantitative research on defense-side legal fees and expenses. When the original source permits, we report estimates of direct defense costs (legal fees and other out-of-pocket costs) as the numerator, and (defense costs plus payout) as the denominator. We thus omit insurers' administrative, marketing and other expenses.

Snapshots of Medical Malpractice Litigation. Studdert and coauthors recently examined defense costs for a random sample of 1452 medical malpractice claims from five liability insurers closed during 1984-2004. They found that legal fees and expenses for all claims (paid claims) were 16% (11%) of the sum of payouts plus defense costs.[6] The Bureau of Justice Statistics also recently released a report on medical malpractice claims during the period 2000-2004.[7] Median loss adjustment expenses/(median payout) for cases settled without trial were 14% of the sum of payouts plus defense costs in Missouri; 19% in Florida; and 24% in Texas. In tried cases, (median loss adjustment expenses/median payout) were 14% (Nevada); 16%

[4] Estimates include Anderson (2004**)**, at 1175 ("Only $0.28 of every dollar of premium is paid in indemnity—the rest is consumed in attorneys' fees and administrative expenses."); Hyman (2002, at 1645) ("for every dollar that reaches an injured patient, almost two additional dollars are spent getting it there"); Weiler (1993, at 17) ("only about 40 percent of the total amount expended in the claims process actually reaches injured patients"); Richards & Thomasson (1992, at 313) ("only 28 cents of every premium dollar goes to injured patients"); Sugarman (1991, at 1502) ("to deliver $1 in net compensation . . . more than $1.35 is spent on claims processing costs . . . . [A]dditional transactions costs not directly attributable to claims processing, including commissions, marketing expenses, and taxes paid and profits earned by insurers . . . probably amount to more than twenty percent of the cost of medical liability insurance."); Newhouse & Weiler (1991) ("About 55 percent of malpractice premium dollars represent administrative costs, largely attorneys' fees and expert witness' fees."); O'Connell, (1976, at 506-508) (estimating 42% of premium dollar is consumed in attorneys fees, and citing various other estimates of total costs as high as 84% of the premium dollar.)

[5] For example, the ratio of defense costs to payouts is lower for paid claims than for all claims. Studies can report direct defense costs or indirect defense costs; and can use premiums collected (i.e., payouts plus defense costs), or payouts as the denominator. The numerator and denominator can be based either on actual costs for closed claims, or on "incurred" amounts, which combine data on closed claims with insurer estimates of future costs for open claims.

The percentages reported here use (payout + defense cost) as the denominator, and thus differ from those reported in the original studies. The adjustments are straightforward. Let D=defense costs, P=payouts, and A = administrative costs. If the original study reports D/P, we compute D/(D+P) as (D/P)/[(D/P)+1]. If the original study reports D/(P+D+A), we compute D/(D+P) as D/[(D+P+A)(1-A/(D+P+A)).

[6] Studdert, Mello, Gawande, Gandhi, Kachalia, Yoon, Puopolo & Brennan (2006, at 2024), supplemented by email correspondence with David Studdert and Michelle Mello.

[7] Cohen & Hughes (2007).

(Missouri); 23% (Maine); 26% (Texas); and 43% (Florida). For Texas, the authors use the same TDI database we rely on.[8]

A 2005 study using closed claims data from Florida over 1990-2003 found that legal fees and expenses were 14% of the sum of payouts and defense costs.[9] A Connecticut report found that legal fees averaged 14% and other defense costs another 3% of indemnity payments for claims closed during 2005-2006.[10] Another 1996 report indicated that legal fees and expenses for 353 closed malpractice claims over 1983-1991 were 25% of the sum of payouts and defense costs.[11] A 1977 report estimated that legal fees and expenses in medical malpractice cases over 1975-1976 were 17-23% of the sum of payouts and defense costs.[12]

Snapshots of Tort Litigation in General. A widely-cited 2003 study by Tillinghast Towers Perrin of tort litigation in general found that incurred defense costs totaled 18% of the sum of incurred indemnity expenses and incurred defense costs.[13] A 1987 synthesis of various studies by the Rand Institute for Civil Justice estimated that defense-side fees and expenses in non-auto tort cases in 1985 were 30% of total expenditures.[14] A 1986 Rand report found that these fees and expenses were 27% (15%) of compensation plus defense costs in state (federal) court.[15]

Time trends. Evidence on time trends is limited and mixed. Some studies report that defense costs have been increasing over the past two decades.[16] A Washington study found a 3.8% overall annual real increase over 1995-2004, and a 5.8% annual rise in cases with positive payout.[17] In Florida, the defense cost data reported by Vidmar and coauthors implies that mean defense cost for paid claims declined during 1990-2003 by an average of 2.8% per year, yet mean cost in claims with no payment rose by an estimated 3.1% per year over 1990-1997 (after which Florida stopped collecting data on these claims). The authors did not explore the tension between these opposite trends.[18]

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[8] Authors' calculations from Tables 6-7 of Cohen & Hughes. Loss adjustment expenses is the term insurers use for legal fees and direct expenses associated with defending a case. Estimate for Texas cases settled before trial reflects a weighted average of the medians for cases resolved after suit and cases resolved before suit.

[9] Vidmar (2005, at 350, 353).

[10] State of Connecticut Insurance Department (2007).

[11] Richards (1996, at 1907).

[12] Danzon (Munch) (1977, at 85). An abbreviated study of a single medical center over 1992-1994 found that 72% of "medical-legal tort system expenditures" (including risk management costs) was for "defense fees and costs and administrative costs." Ransom, Dombrowski, Raeann Shephard & Leonardi (1996).

[13] Tillinghast Towers Perrin (2003, at 17). The 2006 update to this periodic report does not provide a breakout of defense costs. *See also* Council of Economic Advisers (2002, at 9) (relying on a pre-2003 Tillinghast report, estimating that defense costs are 21% of the sum of payouts and defense costs).

[14] Hensler, Vaiana, Kakalik & Peterson (1987, at 25-29).

[15] Kakalik (1986, at 113).

[16] Congressional Budget Office, (2004) ("legal defense costs grew by about 8 percent annually during the 1986-2002 period, from around $8,000 per claim to more than $27,000.") (nominal dollars).

[17] State of Washington (2005).

[18] Vidmar, Lee, MacKillop, McCarthy & McGwin (2005), Tables 14-15. We converted the nominal dollars reported in this study to real dollars based on the national Consumer Price Index. Kessler (2006, table 1) reports that

Claim characteristics. Two studies in the 1990s by Insurance Services Offices, Inc. indicate that defense costs correlate with claim characteristics, including the type of coverage, the number of defendants, case complexity, whether liability is a close question, and claim value.[19] Although more money is spent in absolute terms defending larger claims, the ratio of defense costs to payouts is higher for smaller claims.[20]

Inside versus outside counsel. Little is known about the factors that lead insurers to choose inside versus outside counsel. Insurers are reported to have experimented with various mechanisms for controlling legal costs, including flat rates and use of in-house counsel.[21]

Hourly rates. We are not aware of prior efforts to study hourly rates for personal injury defense counsel, or how these rates vary over time.

Hersch and Viscusi. A contemporaneous study by Hersch and Viscusi uses the same TDI database we use, but without our focus on medical malpractice cases. They report that defense costs in individually reported claims ($10,000 nominal or more) average $22,000 ($38,000 in medical malpractice cases) (1988 dollars). Defense costs average 22% (25%) of payouts in all cases (medical malpractice cases), and increased at 2.9% (3.7%) per year for all cases (medical malpractice cases) over 1988-2004. They also examine the factors which predict insurer use of inside versus outside counsel. We discuss this study further below.[22]

III. Data Sources and Methodology

A. Principal Source for Defense Costs: Texas Closed Claims Database

Our principal data source for defense costs is the Texas Closed Claims Database (TCCD). This is a publicly-accessible database containing reports of closed personal injury claims covered by five lines of commercial insurance: general liability, auto liability, multi-peril, medical professional liability, and other professional liability insurance. We describe this database in an earlier article, but summarize relevant parts of that discussion here.[23] The TCCD contains reports of all insured medical malpractice claims closed from 1988 on, involving payouts by all defendants of more than $10,000 in nominal dollars; data are currently available through 2004.

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medical malpractice loss adjustment expense declined from 24.7% of the sum of incurred losses and loss adjustment expenses in 1992 to 23.4% in 2002.

[19] Insurance Services Office, Inc., (1998, at 17) ("Several characteristics of claims directly affect the amount of allocated loss adjustment expenses an insurance company incurs," with the "most important [being the] type and severity of injury, type of accident, final legal disposition, use of legal counsel, number of potentially liable parties involved, and business class."); Insurance Services Office, Inc., (1992, at **[xx]**) (**[xxx]**).

[20] Insurance Services Office, (1998, at 17 tbl. 11) (ratio of loss adjustment expenses to payments declines from 0.196 for cases with payout from $75,000-$99,999 to 0.096 for cases with payout > $1 million) (nominal dollars).

[21] Silver (1997-1998, at **[xx]**).

[22] Hersch & Viscusi (2007).

[23] Black, Silver, Hyman & Sage, *Stability, Not Crisis* (2005).

Beginning in 1990, TDI checked each report for internal consistency and reconciled individual reports with insurer-level aggregate annual reports.[24]

A "claim" is an incident causing bodily injury and resulting in a request to an insurer by a policyholder for coverage. An insurer must file a report with the Texas Department of Insurance ("TDI") in the year a claim "closes" – i.e., when the insurer "has made all indemnity and expense payments on the claim."[25] When total known payments to a claimant by all defendants equal $25,000 (nominal) or more, the primary carrier for each defendant must complete a "Long Form" that includes details on claim characteristics. When total payments are $10,001-24,999 (nominal), each primary carrier must complete a less extensive "Short Form," that omits the cause of injury.[26] When total payments are $10,000 (nominal) or less, the primary carrier files an aggregate annual report that lists the number of claims and the aggregate payout to claimants, but no information on defense costs.

We convert all payouts to 1988 dollars using the *Consumer Price Index for All Urban Consumers* (CPI). We study "large paid claims" -- claims with payout of at least $25,000 in 1988 dollars (roughly $43,000 in 2006 dollars).[27] Each report includes outside counsel expense, inside counsel expense, and other loss adjustment expense (filing fees, expert witness fees, and the like), and total defense cost (the sum of these three items).[28]

Medical malpractice cases. In classifying claims as involving medical malpractice, we use an approach consistent with our prior studies of Texas medical malpractice cases.

Many medical malpractice cases involve multiple defendants. Beginning in 1991, TDI sought to identify multiple reports relating to the same incident ("duplicate reports"), but its approach is imperfect. In particular, TDI does not identify reports as duplicates if they were filed in different years. We review all medical malpractice claim reports to identify duplicate reports for 1988-1990 and duplicate reports filed in different years.[29] When two reports relating to the

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[24] TDI has acknowledged potential problems with reporting completeness and consistency in 1988 and 1989. These problems do not appear to bias the sample of claims that were reported in those years. See Black, Silver, Hyman, and Sage, *Stability, Not Crisis* (2005).

[25] TDI, Closed Claim Reporting Guide (2004), at 18.

[26] The TDI Closed Claim Reporting Guide (containing reporting instructions), the long and short forms, summary "Closed Claim Annual Reports", and the core data on which we rely are available at http://www.tdi.state.tx.us (reports available from 1997 on). Reports for earlier years are available in hardcopy from TDI. In some cases, the online data was incomplete and we used information provided to us directly by TDI.

[27] The reporting thresholds are not inflation-adjusted. Thus, some claims that are reported on the Long Form in later years would have been reported on the Short Form or not individually reported at all in earlier years. To address this "bracket creep," we exclude from the sample cases with payouts by all defendants between $25,000 nominal and $25,000 real. For convenience in running regressions, we exclude from the dataset one medical malpractice case with resolution stage coded as "other." We also exclude two outlier auto liability cases with defense costs > $5 million.

[28] Prior to 2003, TDI did not verify whether the three expense items summed to total defense cost. Many reports have small discrepancies between the sum of expense items and total defense cost. Some reflect rounding, the others appear to be random. The sum across reports of individual expense items nearly equals total defense cost, both in aggregate and for each year. When studying total defense costs, we rely on reported totals, rather than summing cost items.

[29]

same claim were filed in different years by insurers for different defendants, we designate the last-closed claim report as the primary report. In measuring defense costs, we sometimes sum across all reports relating to the same claim, and sometimes treat each report as separate, as seemed appropriate for a particular analysis. Except as noted below, we obtain similar results either way.

The TCCD offers several plausible ways of identifying medical malpractice claims -- based on type of insurance, type of defendant, and cause of harm. We rely primarily on a dataset, which we call BRD_{minus} for consistency with our prior work, which includes cases which meet two of the following three criteria:

- The claim was paid under medical professional liability insurance
- The claim was against a health care provider (physician, hospital, or nursing home)[30]
- The claim involved injuries caused by complications or misadventures of medical or surgical care

We also include cases which meet one of these criteria and otherwise seem likely to involve medical malpractice. For example, we include cases against nursing homes which were paid under "other professional liability" rather than medical professional liability insurance. We treat cases paid under automobile liability insurance as auto cases. This leaves us with a medical malpractice sample of 16,116 reports (14,241 distinct cases, after taking duplicate reports into account) involving total payouts over 1988-2004 of $4.6 billion and total defense costs of $617 million.[31]

Other types of cases. For the other four areas (general commercial, auto, multi-peril, and other professional liability), we largely use the type of insurance to determine the type of claim. We remove from each category any cases that are in BRD_{minus}. We include cases that are covered by medical professional liability insurance but are not within BRD_{minus} in the "other professional liability" category; over 90% of these cases are against dentists. For these other areas, we cannot sum across duplicate reports to measure total defense costs for a particular claim, since TDI reports whether a report is a duplicate, but not which original claim it duplicates. We judged that the potential benefit from hand-matching original and duplicate reports was not worth the large effort required; only 2% of the reports in other types of cases are duplicates, compared to 12% in medical malpractice cases.

B. TCCD Dataset Limitations

The TCCD includes a number of important limitations which affect this study:

General Data Limitations. We have no data on open claims, or on closed claims with payouts of less than $25,000. The large paid claims that we study are responsible for a large fraction of aggregate payouts (ranging from 74% in auto cases to almost 99% in medical

[30] Other types of health-care providers (for example, nurses and free-standing medical clinics), are not separately listed in the Long Form.

[31] In identifying duplicate reports, we sometimes exercised judgment when claim reports were similar but not identical. Insurers also make some reporting errors that TDI does not catch. In a few cases when both the error and the correction were apparent, we corrected the underlying data. Details on the procedure we used to identify duplicates, the data adjustments we made, and our inclusion criteria are available from the authors on request.

malpractice cases), but a smaller and unknown percentage of aggregate defense costs (estimated below at 60% for medical malpractice cases). We have no data on injury severity, physician specialties, patient gender, or the identities of particular defendants or insurers, and limited information on defendant type. Each report includes policy limits only for the insured defendant, and only for the primary policy covering that defendant. We do not know which defendants had excess policies, except when a payout on an excess policy was made.

Uninsured claims and defendants. The TCCD includes only "insured" claims, including claims paid by captive insurers and risk-pooling and risk-retention groups, but not claims paid by "pure" self-insured providers. In particular, we lack data on claims against the University of Texas hospital system and UT-employed physicians. We have no reason to believe that the fraction of "missing" claims changes over time.

Resolution stage information. We have partial information on the stage at which a claim is resolved. For example, if a case is resolved after suit but before trial, insurers must code it as either stage 3 ("alternative dispute resolution after suit filed") or stage 4 ("settlement reached before trial"). If a suit is filed, the case goes through alternative dispute resolution ("ADR") which fails to resolve the case, and the case is then settled, the most likely coding is stage 4, but we lose the information that ADR was attempted.

Defense cost information: We have information on inside counsel expense, outside counsel expense, other loss adjustment expense ("other expense"), and total defense cost (the sum of these three amounts), but no data on the components of other expense. Some cases have outside counsel expense but zero other expense; the outside counsel line may includes expenses incurred by counsel and billed to the insurer. For reports (cases) where insurers report zero defense cost, we cannot be sure whether this is correct or information is missing. The reporting patterns are broadly consistent with correct reporting. For example, 637/1124 (57%) of cases resolved before suit is filed have zero reported counsel expense, compared to 266/12,081 (2.2%) of cases resolved after suit but before trial, and 6/710 (0.8%) of cases that went to trial..[32] In our principal regressions, we first log-transform dollar values; this results in dropping observations with zero defense costs.

Initial reserves. For medical malpractice cases, in 1,016 reports (out of 16,116), the initial indemnity reserve exactly equals the payout. In 174 additional reports, the expense reserve equals defense costs. Thus, some insurers apparently recorded initial reserves only when the case outcome was known, settled at the exact amount of the initial reserve, spent exactly the initially reserved amount on defense costs, or misreported to TDI. Because we can not distinguish among these alternatives, we exclude these cases from regressions that use initial reserve as a variable. Regression results are similar if we include these cases.

County-level variation. Below, we report statewide experience, but control for time-invariant county-level factors using county fixed effects. We expect to explore in future work what can be learned from county-level examination of claim outcomes.

[32] Zero counsel expense is possible in a case in which counsel was retained, if there were multiple defendants who used common counsel, who was paid by another defendant. For the six trials with zero counsel expense, two had counsel expense reported by another defendant, and three had a nonreporting defendant who may have paid counsel. The remaining case likely involves incomplete reporting.

Insurer reserving practices. We discuss insurer reserves for defense costs and, to a more limited extent, insurer reserves for payouts, but do not study insurer reserving practices in detail.

Liability caps. Texas adopted comprehensive tort reform, including caps on non-economic damages, effective for claims filed after Sept. 1, 2003. These changes largely postdate the period we study, so we cannot assess how they will affect outcomes. In the long run, one would expect liability caps to reduce the number of large paid claims, the average payout per claim, and the cost of defending against claims (since exposure is lower).

C. Defense Attorney Hourly Rate Information

Beginning in 1989, the Texas State Bar has conducted extensive surveys of hourly rates and other billing practices for Texas lawyers. We rely on these surveys to determine median hourly rates over the period from 1989-2005.[33]

The state bar surveys contain aggregate information for the entire period, and information by specialty, including personal injury defense counsel. During the 2000-2005 period, for which we have both overall data and specialty data, the time trend for median hourly rates charged by personal injury defense counsel is similar to the trend for all Texas lawyers.

D. Implicit Model of the Claims Generating Process and Statistical Methodology

Below, we present various regression analyses of time trends, and the factors that are correlated with payouts and defense costs. Our implicit model of the claims generating process is that people have some number Y of medical encounters per year, of which a fraction f lead to a malpractice claim, of which a further fraction p lead to a payout over $25,000, and hence are included in our dataset.

The number and nature of medical encounters can vary across time. The fractions of these encounters that lead to claims and to payouts can vary across time and with the nature of the encounter, the characteristics of the plaintiff and defendant, and the defendant's insurance coverage. We treat the cases in our dataset as resulting from independent draws from a pool of encounters, each of which produces a claim included in the dataset with probability ($f \bullet p$). We observe $Y \bullet f \bullet p$ claims in our dataset, and the payout and defense cost amounts for each.

We assume that, apart from a possible time trend, the payout and defense cost for each claim is independent of outcomes in other claims. This assumptions will not be strictly true. In particular, (i) insurers may adjust their defense spending and other defense tactics based on prior success or failure; (ii) insurers may have an overall per case or annual target defense budget, so that extra spending on one case predicts lower spending on other cases: (iii) insurers may have an overall target for how many cases to take to trial or to appeal, and (iv) different insurers may have different defense practices, which we cannot observe because we lack insurer identities. Any cross-sectional dependence should be partly captured, however, by our year control

[33] We obtained reports for 1989, 1994, and 1996 from the State Bar. The 2000, 2003, and 2005 reports are at http://www.texasbar.com/template.cfm?section=research_and_analysis.

variable. Apart from a time trend toward higher defense costs, there is no evidence of serial autocorrelation.[34]

The distributions of defense cost, payout, policy limits, and other dollar variables have a strong positive skew. Residuals from regressions with defense cost or one of its components as the dependent variable are often skewed as well, and thus violate the usual normality-of-errors assumption of OLS. A further problem is that dollar amounts are bounded at zero and our data includes a substantial number of reports with zero defense costs. We therefore take natural logs of dollar variables. The distributions of the logged amounts and regression residuals come respectably close to being normal, so OLS should be reasonably well-specified.[35] However, taking logs solves a statistical problem at the cost of introducing sample selection bias; for example, cases with zero defense cost, for example, are much more likely to have been resolved prior to a suit being filed. In robustness checks, we obtain qualitatively similar results but sometimes weaker if we do not take logs, or if we take logs but add $1 to the reported defense cost of each case in order to not lose zero cost observations.

Because time trends may differ across counties (urban versus rural counties for example, we use county fixed effects in all *OLS* regressions (they are not available for the probit regressions in Table 4). We obtain similar results without county fixed effects.

For regressions with year as an independent variable, we make no claim that year causally explains anything. Instead year proxies for changes in the world which have a time trend. For regressions that analyze the relationship among reserves, damages, and defense costs, we report association but make no claim as to causation, partly because endogeneity is a significant concern for our dataset. For example, we expect that both payout and defense cost are determined by unobserved case characteristics and that each influences the other (larger expected payout induces larger defense spending; larger defense spending reduces expected payout). But we lack a way to estimate either effect. On theoretical grounds, it is likely that larger *expected* payout (for which actual payout is a respectable proxy) induces larger defense spending, rather than the other way around, but all we can say is that larger payout is associated with larger defense spending.

Ln(policy limits) offers, in some ways, a cleaner measure of potential exposure. Limits are determined before the case arises, so they cannot be influenced by defense costs and cannot be directly influenced by case characteristics. Still, endogeneity is possible, if defendants who are likely to experience larger claims purchase larger policies.

Endogeneity and omitted variables could affect other relationships as well. For example, the stage at which a claim is resolved predicts defense cost -- the later the stage, the higher the cost. So does the length of time a claim is open. These results may well be causal. Other things equal, it makes sense that a case that goes to trial costs more to defend than a case that settles

[34] A Durbin-Watson test failed to reject the null hypothesis of no serial auto-correlation in yearly mean and median ln(payout), or for detrended ln(defense costs) and detrended mean and median per case ratio of defense cost/payout.

[35] A Shapiro-Wilk test generally rejects normality of residuals, but visual examination of a kernel density plot, which compare the probability density of the residuals to a normal distribution, indicates only minor deviations from normality for all regressions reported below.

before trial. We cannot ascribe causation, however, because unobserved case characteristics could predict both stage of resolution and defense costs.

E. A Simple Model of Defense Costs

We test a simple model of defense costs. Defense costs are composed of attorneys fees and other expenses (primarily fees for expert witnesses and related deposition and discovery costs). We expect defense costs to be a function of:

- Case complexity (imperfectly proxied by type of case, whether the case involves multiple defendants, and the number of defendants). We also have data on the nature of the harm (for example, brain damage, multiple injuries, death) and on plaintiff age, but once we control for estimated stakes, these variables do not significantly predict defense costs.
- The estimated stakes (imperfectly proxied by the amount paid to settle the case). Another possible proxy, initial indemnity reserves, has much weaker predictive power (see Table 4).
- The maximum loss (imperfectly proxied by the policy limits). This proxy is imperfect because we lack data on excess policies and because in some cases the insurer pays above limits.[36]
- Case duration (proxied by ln(days claim open)). One might expect attorneys to work more hours, the longer a case remains open. We obtain similar results if we instead use ln(days from injury to claims closing) as a measure of duration.
- The procedural steps necessary to resolve the case (imperfectly proxied by the stage at which the case is resolved);

There are other factors which we cannot readily observe or proxy for which may affect defense costs. Unobserved factors include the strength of the plaintiff's case (affected by the personal characteristics of the plaintiff and defendant, and the experience and reputation of their lawyers; and the reputational stakes for the defendant.

We also investigate the factors that predict the components of defense costs. Attorney fees for outside counsel are by far the largest component. We assume that these fees equal number of hours worked times hourly rate. We have no data on different hourly rates charged by different lawyers working on the same case, or how case characteristics affect choice of lawyers (beyond the basic decision to use inside or outside counsel). We have only statewide data on billing rates, and no data on alternative billing arrangements.

In broad picture, we expect the same factors that predict overall defense costs to predict each component. We also expect that more complex cases are more likely to be handled by outside counsel. It is also possible that cases with greater stakes (controlling for complexity) are more likely to go to outside counsel. The factors affecting other expenses (number of experts, hours per expert, hourly rate for experts, number of depositions) are not observable.

[36] See Hyman, Black, Zeiler, Silver & Sage, *Jury Verdicts* (2007); Zeiler, Silver, Black, Hyman & Sage, *Policy Limits* (2007)

IV. Defense Costs in Medical Malpractice Cases

A. Summary Information on the TDI Dataset

Table 1 provides summary statistics for medical malpractice cases in our dataset. We have 16,116 long form reports, covering 14,241 discrete cases. The remaining 1,865 reports are duplicate reports, covering the same claim as another report in our dataset. The mean (median) defense cost per large paid claim is $43,000 ($27,000). These amounts are comparable to those reported in other studies.[37]

Table 1. Summary Statistics for Medical Malpractice Cases

	Total Defense Costs	Cost Categories		
		Outside Counsel	Inside Counsel	Other Expenses
All BRD_{minus} reports	16,116			
Reports with zero defense costs (% of all reports)	571 (3.5%)	2,549 (15.8%)	14,413 (89.4%)	3,511 (21.8%)
Reports with positive reported defense costs (% of cases with positive total defense costs)	15,425 (100%)	13,657 (87.3%)	1,730 (11.0%)	12,605 (81.1%)
Nonduplicate BRD_{minus} cases (defense cost summed across duplicate reports)	14,241			
Cases with zero defense costs (% of all cases)	487 (3.4%)	2,099 (14.7%)	12,635 (88.7%)	2,841 (19.9%)
Cases with positive reported defense costs (% of cases with positive total defense costs)	13,754 (100%)	12,142 (88.3%)	1,606 (11.7%)	11,400 (82.9%)
Mean (median) defense cost	$43,000 ($27,000)	$31,000 ($18,000)	$3,000 ($0)	$10,000 ($4,000)
Percentage of total defense cost	100%	71.0%	5.9%	23.0%

Summary data on all closed claim reports and all nonduplicate cases, and mean (median) defense costs, for cases in the BRDminus dataset of medical malpractice claims closed from 1988-2004 with payout > $25,000 in 1988 dollars. Amounts in thousands of 1988 dollars. [**Source:** defensecosts.xls, Frequencies worksheet, Table 2.2 (All BRD_{minus} reports), Table 2.1 (nonduplicate cases; payout worksheet, Table 1.9 (mean defense cost); Relative Cost worksheet, Table 3.2 (mean defense cost)

Table 2 provides summary statistics for the five types of cases in the TDI dataset. Panel A is based on line of insurance. It provides basic claim count and payout information for all claims, including claims closed with payment of $10,000 nominal or less, which are not individually reported, but are summarized in an aggregate annual report. The aggregate reports are available beginning in 1995, and include information on payouts but not on defense costs.

As Panel A indicates, smaller fraction of medical malpractice and other professional liability cases result in a positive payout (18%), versus 28% for general commercial, 39% for

[37] See Bureau of Justice Statistics (2007) (median defense costs for cases settled before trial over 2000-2004 of $12,000 in Maine, $13,000 in Missouri, $19,000 in Florida, and $29,000 in Texas (also using the TDI database, but a broader dataset -- all closed claim reports with payout over $10,000 covered by medical malpractice insurance) (reported in 2004 dollars, converted here to 1988 dollars); Studdert et al. (2006) (mean defense costs of $36,000 for cases with positive payout) (reported in 2004 dollars, converted here to 1988 dollars).

multi-peril, and 56% for auto cases. However, medical malpractice payouts are more likely to be large (over $25,000). Large payouts are 65% of paid claims versus 6-14% in other areas.

Panel B is based on type of case, and provides more detailed information on large paid claims. Medical malpractice cases average 2.4 defendants per claim, similar to other professional liability, and substantially more than the other types of cases. Medical malpractice cases have the highest payouts and are the most expensive to defend, both in raw dollars and in the ratio of defense costs to payout. They are more likely to be resolved after a suit is filed, and more likely to involve positive defense costs.[38] On all these measures, auto cases are the least complex type of litigation.

Table 2. Summary Statistics for All Personal Injury Cases

Panel A: Statistics for All Claims *by Line of Insurance*

	(1)	(2)	(3)	(4)	(5)
Line of insurance	**automobile**	**general commercial**	**multi-peril**	**other prof. liability**	**med prof. liability**
Panel A: All closed claims (1995-2004)					
Total claims	544,640	435,593	190,236	19,816	77,575
% with $0 payout	44.3%	71.5%	60.5%	82.0%	81.9%
% with payout from $1-$25,000	52.3%	26.7%	36.4%	15.4%	6.3%
% Large paid claims (payout ≥ $25,000)	3.4%	1.9%	3.1%	2.6%	11.8%
Mean annual payout on large real claims (% of total payout)	73.8%	90.2%	86.6%	93.0%	98.7%

[38] A t-test for difference in means shows a significant difference between medical malpractice and each other type of case for each of these measures.

Panel B. Statistics for Large Paid Claims *by Type of Case*

	(1)	(2)	(3)	(4)	(5)
Type of case	**automobile**	**general commercial**	**multi-peril**	**other prof. liability**	**BRD_{minus}**
Total claim reports	32,062	18,164	12,024	1,001	16,116
Nonduplicate cases	31,933	17,592	11,594	972	14,241
Mean defendants per claim	1.24	1.87	1.75	1.92	2.41
Mean (median) days claim open	830 (734)	1,007 (903)	896 (803)	873(718)	922 (807)
Mean (median) payout	$154 ($60)	$253 ($77)	$199 ($66)	$193 ($63)	$322 ($134)
Mean (median) defense cost	$12 ($4)	$28 ($13)	$21 ($10)	$26 ($14)	$43 ($27)
Mean (median) defense cost/payout	13% (5%)	24% (13%)	21% (11%)	29% (18%)	31% (17%)
Aggregate (defense cost/payout)	8%	11%	11%	13%	13%
Cases with suit filed (%)	67%	87%	82%	90%	92%
Cases with defense costs (%)	76%	89%	85%	92%	97%
Cases with full trial (%)	2.7%	3.0%	3.0%	3.1%	2.7%
Outside/total counsel expense	95.0%	96.5%	94.0%	95.7%	92.3%

Summary data for personal injury claims closed from 1988-2004, included in the TDI database of commercially insured personal injury claims and annual aggregate insurer reports. Amounts in thousands of 1988 dollars. Duplicate reports are identified by us for BRD_{minus} cases and by TDI for other cases.

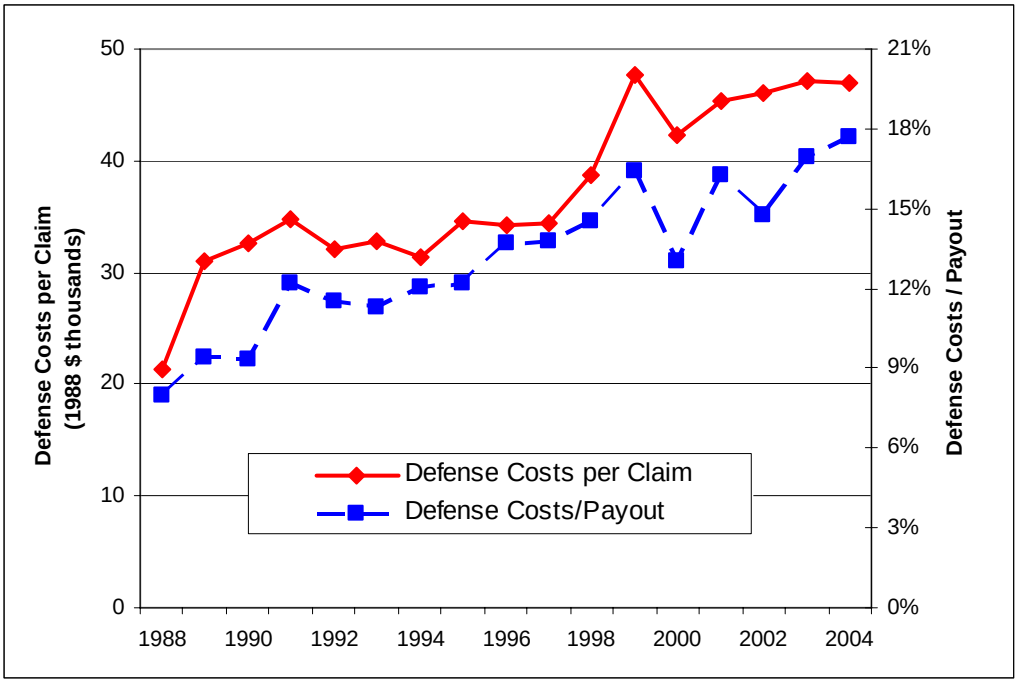
Panel A: Sample limited to 1995-2004 (the period for which annual aggregate reports are available). Claims are classified based on line of insurance. Duplicate claims are excluded for individually reported claims (payout > $10,000 nominal).

Panel B. Summary data for large claims (payout > $25,000 in 1988 dollars). Column (2) excludes 1,375 cases from 1997 with other products manufacturer as defendant type. Columns (1-4) exclude cases in the BRD_{minus} dataset of medical malpractice cases, and exclude defense costs for insurers who file duplicate reports. Column (5) sums defense costs across duplicate reports.

B. Time Trends, Payouts, and Other Predictive Factors

A central finding of this study is that defense costs rose substantially over our sample period, even though payouts showed no time trend (see Part VI.B). As Figure 1 reflects, defense costs roughly doubled, rising from 9.4% of total payout in 1988 to 17.7% in 2004.

Figure 1. Time Trends in Medical Malpractice Defense Costs



Mean annual defense cost per claim and annual ratio of defense costs to payout for all nonduplicate medical malpractice cases with positive defense costs in the BRD_{minus} dataset. Amounts in thousands of 1988 dollars.

Table 3 uses regression analysis to explore a variety of factors that predict defense spending. The dependent variable for regressions (1-4) is ln(defense cost). Regression (1) reports the unconditional time trend in payouts, which rise at 4.6% per year. Regression (2) reports the trend conditioned only on payout. Regression (3) adds a variety of claim and stage of resolution controls. Regression (4) adds ln(days claim open) as an additional control variable. In regression (5), we switch to the ratio of defense cost to total cost (payout + defense cost), with similar results to regression (4). The independent variables are:

- Year: The unconditional rise in defense costs is 4.6% per year. This coefficient is stable if we control for payout (regression 2) and other claim and outcome variables (regression (3)). The coefficient increases to 5.1% per year in regression (4) when we add ln(days claim open) as an additional independent variable. The higher coefficient in regression (4) reflects the combination of two factors: (i) the longer a claim stays open, the more it costs to defend; but (ii) claims have closed more quickly over time (see Table 11).
- Ln(payout): We expect insurers to spend more to defend cases with larger exposure. Actual payout is a proxy for exposure. In regression (2), a 1% increase in payout predicts a 0.45% increase in defense cost. This coefficient is lower, at 0.33-0.34% with the fuller controls in regressions (3-4). The lower coefficient may be due to correlation between payout (as a proxy for exposure) and other claim characteristics which are also affected by exposure.[39] While larger cases cost more, defense costs rise less than proportionately

[39] We test for and do not find evidence of significant nonlinearity in the log-log relationship between defense cost and payout. We also assess whether insurers' initial reserves are a useful proxy for expected exposure, as suggested by Hersch & Viscusi (2007), and conclude that they are of limited value. If one replaces ln(payout) with

with payout. This can be seen in the 0.341 coefficient on ln(payout) in regression (4), indicating that a 1% rise in payout predicts only a 0.34% rise in defense cost. It is also reflected in the strongly negative coefficient on ln(payout) in regression (5), where we switch to (defense cost/defense cost + payout) as dependent variable.

- Ln(policy limits): Other things equal, a case with large policy limits has larger exposure for the insurer. Thus, policy limits may predict defense costs for cases in which potential damages are comparable to policy limits, which is often the case in medical malpractice cases. We indeed find a positive coefficient on ln(policy limits) in regression (4). One would expect the effect of policy limits to be stronger in cases with larger expected payout (relative to policy limits). In unreported regressions similar to regression (4), we confirm that the coefficient on ln(policy limits) is insignificant for cases with payout < 50% of limits. In cases with payout > 50% of limits, the coefficient is 0.084 (roughly twice the whole-sample coefficient in regression (4)), and statistically significant (t = 4.27).

- Case complexity: As measures of case complexity, we include a multi-defendant dummy (equal to 1 if there is more than one defendant, 0 otherwise), and a number of other defendants variable which varies from 0 to 7 (insurers are asked to report the number of other defendants up to 6, and otherwise report "more than 6"; we code this response as "7"). Both variables are positive and significant (regressions (3-5)).

- Resolution stage: We include a family of dummy variables, which equal 1 if a case reaches a particular stage (such as a suit being filed), 0 otherwise. Defense cost rises if a suit is filed, if a trial is begun, and if an appeal is filed (regression (3)). But there is no significant additional cost if trial is completed, compared to simply begun. The coefficient on the full trial dummy is small, insignificant, and switches signs between regression (3) and regression (4). Cases that go to appeal cost more than cases that are tried but not appealed (regression (3)). However, the coefficient on appeal drops and becomes insignificant when we separately control for ln(days claim open) in regression (4).

- Ln(days claim open): Another plausible factor that can affect defense cost is the length of time the claim is open, defined as days elapsed from the date a claim file was opened to when it was closed. Days open can imperfectly proxy for the amount of time spent working on the case. This variable is positively related to defense cost, as expected. When it is added, in regression (4), the appeal dummy variable drops in magnitude and becomes insignificant.

- In unreported regressions, we include dummy variables for whether the "primary defendant" (the defendant whose insurer files the primary report) is a physician, hospital, or nursing home, with "other" as the omitted defendant category; the coefficients are small and insignificant.

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ln(initial expense reserve) in Table 3, regression (2), the coefficient on ln(initial expense reserve) is positive and significant (coefficient = 0.157 (t=13.36) but adjusted R^2 drops from 0.181 to 0.048. If one replaces ln(initial expense reserve) with ln(initial indemnity reserve), the coefficient on ln(initial indemnity reserve) is not significant. Finally, in the same regression with both ln(initial expense reserve) and ln(initial indemnity reserve), both are positive and significant, but adjusted R^2 is only 0.051.

The results, indicating higher defense cost the longer a case lasts, and the later the stage at which the case is resolved, are intuitively plausible. Still, we stress that we cannot infer causation, because unobserved case factors could predict the independent variables of interest (including payout, stage of resolution, and time to closure) as well as the dependent variable.

Table 3. Factors Predicting Medical Malpractice Defense Costs

	(1)	(2)	(3)	(4)	(5)
Dependent variable	ln(defense cost)				defense cost/(defense cost + payout)
Year	**0.046 (19.95)*** **	**0.046 (21.94)*** **	**0.045 (25.54)*** **	**0.051 (31.52)*** **	**0.0058 (27.62)*** **
ln(payout)		**0.452 (49.50)*** **	**0.330 (39.33)*** **	**0.341 (44.35)*** **	**-0.082 (-79.19)*** **
ln(policy limits)			**0.059 (6.99)*** **	**0.043 (5.50)*** **	**0.0065 (6.51)*** **
dummy (suit filed)			**2.503 (47.19)*** **	**1.908 (35.86)*** **	**0.128 (32.60)*** **
dummy (trial started)			**0.738 (17.46)*** **	**0.578 (14.00)*** **	**0.077 (11.25)*** **
dummy (full trial)			0.072 (1.18)	-0.009 -0.14	0.0023 (0.22)
dummy appeal			**0.352 (4.26)*** **	0.099 (1.23)	0.0215 (1.48)
dummy multiple defendants			**0.141**	**0.105**	**0.0114**
			(6.18)* **	**(5.04)*** **	**(4.18)*** **
No. of other defendants			**0.047**	**0.036**	**0.0068**
			(7.01)* **	**(6.04)*** **	**(8.99)*** **
ln(days claim open)				**0.705**	**0.076**
				(39.49)* **	**(40.41)*** **
constant	9.674	4.278	2.42	-1.66	0.38
	(407.33)	(37.73)	(16.40)	(9.86)	(20.65)
Sample size	13,754	13,754	13754	13754	14241
Overall adj. R^2	0.0286	0.1811	0.4342	0.5246	0.4691

Regressions of ln(defense cost) and ratio of defense cost to (defense cost + payout) on indicated independent variables for nonduplicate medical malpractice cases with positive defense costs in the BRD_{minus} dataset. All regressions use 1988 dollars, county fixed effects and White's heteroskedasticity-consistent standard errors. *, **, *** indicates significance at the 10%, 5%, and 1% levels, respectively (suppressed for constant term). Significant results at 5% or better in **boldface**.

D. Insurer Initial Reserves

TDI requires insurers to report initial reserves (the first reserve estimate they made) for both payout and defense costs.[40] We assess here how good insurers are at predicting defense cost in their reserve estimates. Not very, as Table 4 indicates. In regression (1), a simple regression of ln(defense cost) on ln(expense reserve) plus a constant term, the expense reserve is positive and significant, but the adjusted R^2 for the regression is only 0.0147. Adding ln(indemnity reserve) in regression (2) scarcely helps; adjusted R^2 improves only slightly to

[40] TDI also requires insurers to report final reserves for payout and defense cost. We do not study these reserves.

.0173. Indeed, knowing the year, and nothing else, provides more power to predict defense costs than the insurer's initial expense reserve (Compare Table 3, regression (1) with Table 4, regressions (1) and (3)). We obtain similar results if we add $1 to the reported defense costs, thus including observations with zero defense costs when we take logs.

The weak predictability of defense costs suggests that insurers may not know much about their likely exposure when they establish initial reserves. In contrast, the *ex post* proxy for exposure provided by ln(payout) has substantially more predictive power (see Table 3, regression (2) and Table 4, regression (4)).

Table 4. Medical Malpractice Cases: Per-Case Predictability of Defense Costs

	(1)	(2)	(3)	(4)
Dependent variable	Ln(defense cost)			
Year			**0.045 (20.49)*** **	**0.045 (22.00)*** **
ln(expense reserve)	**0.131 (11.99)*** **	**0.144 (12.31)*** **	**0.148 (13.63)*** **	**0.114 (11.28)*** **
ln(indemnity reserve)		**-0.023 (-2.70)*** **		
ln(payout)				**0.368 (41.75)*** **
Constant	Yes	Yes	Yes	Yes
Sample size	12,790	12,670	12,790	12,790
Overall adj. R^2	0.0136	0.0147	0.0458	0.165

Regressions of ln(total defense cost) on year, ln(initial expense reserve), ln(initial indemnity reserve), and other indicated variables for medical malpractice claim reports with positive defense costs in the BRD_{minus} dataset, excluding cases with expense reserve = defense cost or indemnity reserve = payout. All regressions use 1988 dollars, county fixed effects and White's heteroskedasticity-consistent standard errors. *, **, *** indicates significance at the 10%, 5%, and 1% levels, respectively (suppressed for constant term). Significant results at 5% or better in **boldface**.

Even if insurers get reserves wrong in individual cases, one might expect them to do a good job of estimating their aggregate exposure. Figure 2 shows the time trends in reserving for both payouts and defense costs. It shows a smoothed three-year average ratio of indemnity reserve to payout (the smoothing reduces the impact of a high (low) number of large payouts in a particular year);[41] the ratio of expense reserve to defense costs; and the ratio of the two reserves to one another.

[41] For 1990-2004, each year's data point gives 50% weight to the most recent year, 33% to the prior year, and 17% to two years prior. For 1989, we give 2/3 weight to 1989 and 1/3 weight to 1988. For 1988, we give 100% weight to 1988. The graph is visually similar with other weighting strategies, including equal weighting of two or three years, 2-year smoothing with 2/3 weight to most recent year.

Figure 2. Medical Malpractice Cases: Initial Reserves Over Time

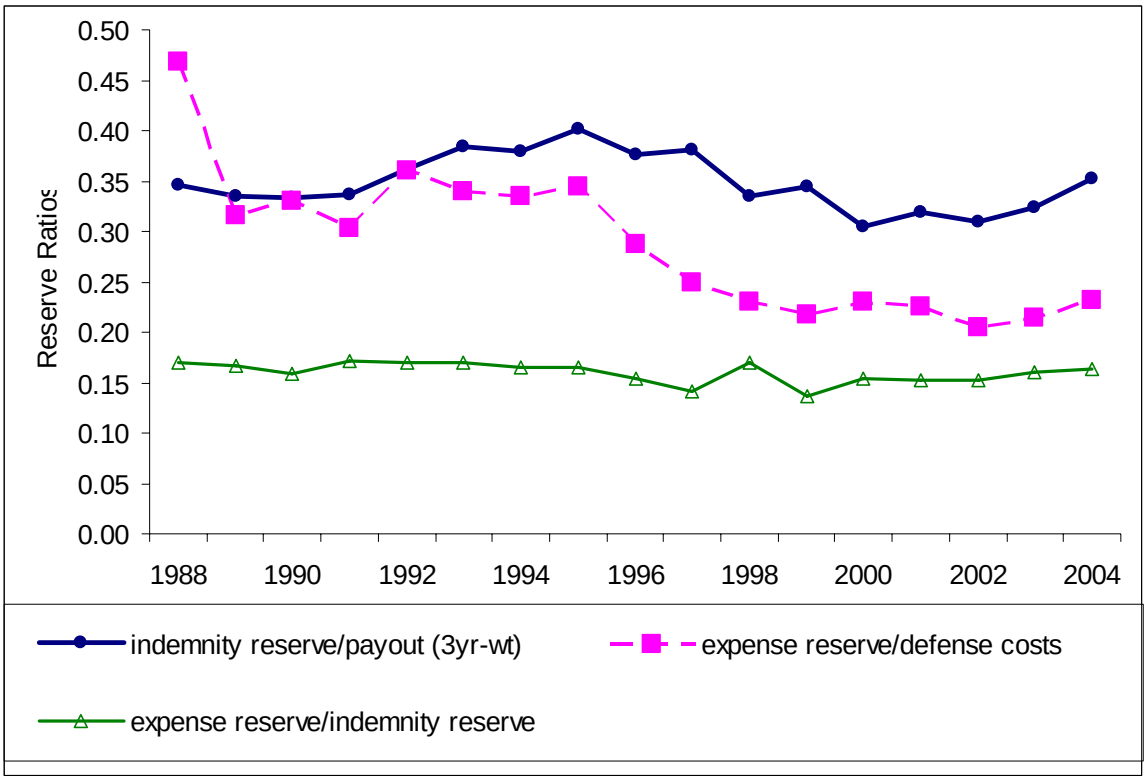


Figure shows four lines: (i) 3-year smoothed ratio of (indemnity reserve)/(primary insurer payout), (ii) (i) 3-year smoothed ratio of (indemnity reserve + expense reserve)/(primary insurer payout plus defense cost), (iii) annual ratio of (expense reserve)/(primary insurer defense cost), and (iii) annual ratio of indemnity reserve/expense reserve, for medical malpractice claim reports in the BRD_{minus} dataset. Smoothed ratio gives weight of 50% to most recent year, 33% to prior year, 17% to two years prior.

The ratio of expense reserves to defense costs declines substantially over time, while the ratio of indemnity reserve to payout varies much less over the period we study. The ratio of expense reserves to defense costs averaged roughly 35% during 1988-1992, but only 22% during 2000-2004. Conversely, the ratio of indemnity reserves to payout averaged roughly 35% during 1988-1992, declines in the second half of the 1990s, but recovers after 2000, ending about where it began, at about 35%.[42] Although the ratio of defense cost to payout roughly doubled, the ratio of expense reserve to indemnity reserve remained relatively constant, averaging 16.7% during 1988-1992, and 15.7% during 2000-2004.

Figure 3 shows the failure of medical malpractice insurers to adjust their defense cost reserving practices in a different way. It presents mean defense costs and initial reserves by year, normalized to their respective means during 1988-1990. Defense costs rise, while reserves do not. We obtain similar results if we study per-case medians instead of means.

[42] Other research finds a similar trend in medical malpractice reserving nationwide, with reserves declining in the "soft" insurance markets of the 1990s and rising in the "hard" market after 2000. See Americans for Insurance Reform (2007); Baker (2005).

Figure 3: Medical Malpractice Cases: Normalized Mean Defense Costs and Initial Reserves

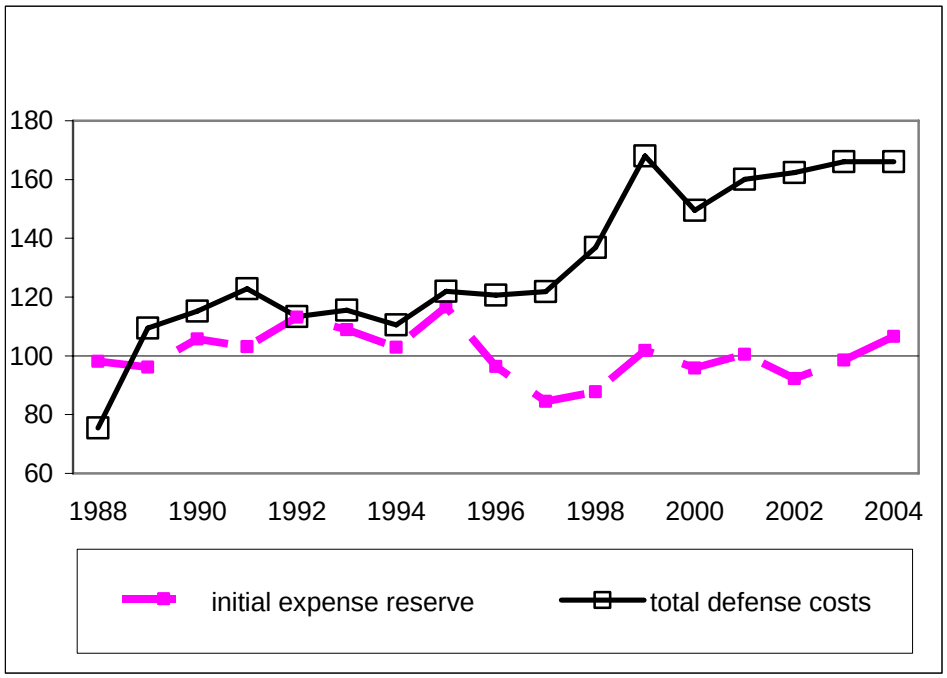


Figure shows two lines: (i) mean per-case initial expense reserve for each year, normalized to a mean of 100 over 1988-1990, and (ii) mean per claim defense costs, similarly normalized relative to 1988-1990, for medical malpractice claim reports in the BRD_{minus} dataset.

Table 5 turns from graphical presentation to regression analysis of changes over time in the ratio of per-case reserves to payments. We exclude outlier reports in which the dependent variable has a small numerator or denominator (indemnity reserve, expense reserve, or expenses < $1,000, or payout < $10,000), or is very small (< 0.02) or large (> 50). In regression (1), there is a modest time trend toward a lower ratio of indemnity reserves to payouts. This result is driven by lower ratios for cases closed in the second half of the 1990s. Regression (2) shows a much stronger trend toward a lower ratio of expense reserves to defense costs. As regression (3) indicates, even though the ratio of defense cost to payout doubled over our time period, the ratio of expense reserve to indemnity reserve *declined* somewhat (we get a similar -0.017 coefficient if we do not control for ln(indemnity reserve)). As regression (4) indicates, the decline in expense reserves drives a decrease in the combined ratio of (indemnity plus expense reserves)/(payouts plus defense costs). Finally, in regression (5), we switch from ratios to ln(dollars), and find that, controlling for ln(indemnity reserve) as a measure of case scale, ln(expense reserve) declined over a 16-year period in which actual expenses doubled. The negative coefficients on year are confirmed by a negative z-score on Cuzick's nonparametric test for trend.[43]

[43] Cuzick (1985).

Table 5. Medical Malpractice Cases: Insurer Reserves

	(1)	(2)	(3)	(4)	(5)
Dependent variable	ln(indemnity reserve/ payout)	ln(expense reserve/defense costs)	Ln(expense reserve/indemnity reserve)	Ln(sum of reserves/(payout + defense costs)	Ln(expense reserve)
Year	-0.0032 (-1.40)	**-0.059 (-23.12)*** **	**-0.019 (-12.53)*** **	**-0.018 (-8.25)*** **	**-0.016 (-8.41)*** **
ln(indemnity reserve)			**-0.621 (-101.26)*** **		**0.278 (28.78)*** **
Constant	-1.146 (-49.24)	-0.671 (-27.28)	5.25 (80.83)	-0.99 (-43.77)	6.12 (60.94)
sample size	13771	11840	12,841	12,246	13,900
overall adj. R^2	0.0001	0.0456	0.4437	0.0010	0.1249
Cuzick test for trend	**-2.20****	**-24.31*****	**-9.40*****	**-10.31*****	**-12.39*****
(p-value)	**(0.030)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**

Regressions of indicated ratios of indemnity and expense reserves to actual payments and defense costs, for medical malpractice claim reports in the BRD_{minus} dataset. All regressions use 1988 dollars, county fixed effects and White's heteroskedasticity-consistent standard errors. *, **, *** indicates significance at the 10%, 5%, and 1% levels, respectively (suppressed for constant term). Significant results at 5% or better in **boldface**.

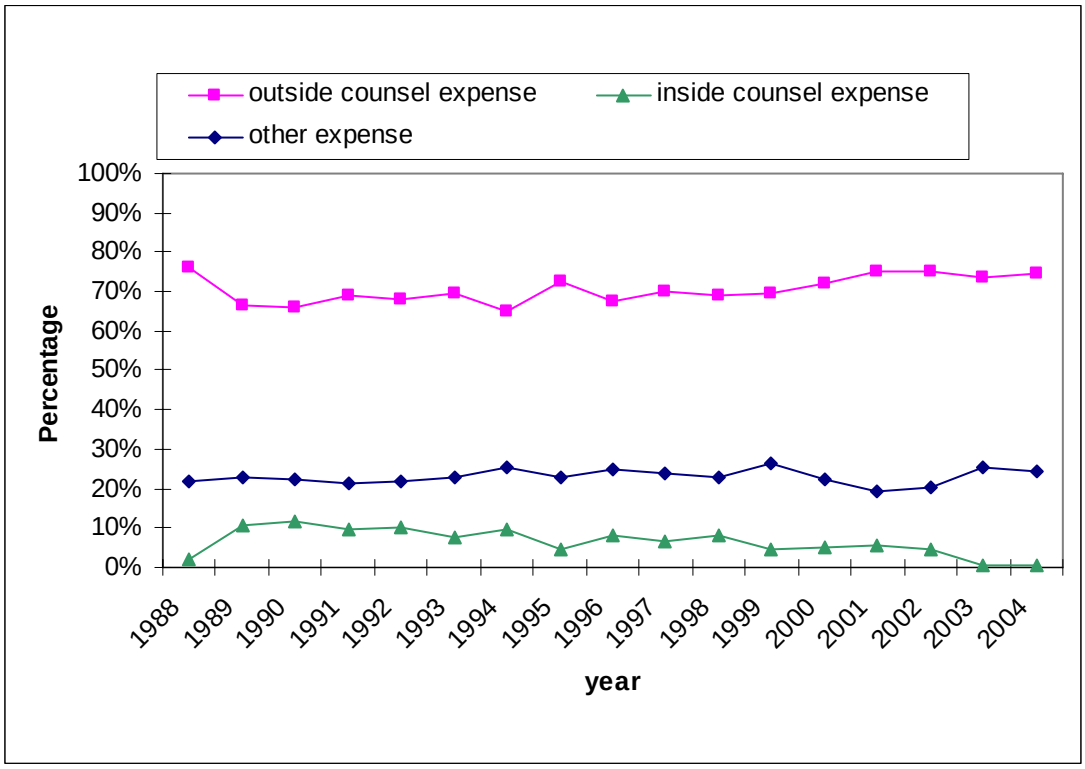
E. Use of Inside versus Outside Counsel

Figure 4 shows the components of defense spending by year. Inside counsel expense is negligible in 1988, rises sharply in 1989, declines gradually over 1989-2002, and again becomes negligible in 2003. There is a similar rise in the number of cases going solely to inside counsel from 11 in 1988 to 79 in 1989 and 122 in 1990; and then a sharp drop from 107 in 2001 and 92 in 2002 to only 9 in 2003 and 13 in 2004.

What might produce this pattern? We were reliably advised that insurers covering a substantial majority of Texas physicians never rely on inside counsel. TDI also confirmed that the jump in reliance on inside counsel in 1989, and the drop in 2003, reflect one insurer changing in the mid-1980s from relying primarily on outside counsel to fully or partly relying on inside counsel, and then returning around 2000 to relying primarily on outside counsel.

We find no evidence that insurers use inside counsel to monitor outside counsel. The dominant pattern is to choose either inside or outside counsel at an early stage and then stay with that choice. Only 176/16,116 reports (1.1%) involve positive expense for both inside and outside counsel. For cases that go to trial, only 0.6% [4/723 reports] involve positive expense for both inside and outside counsel.

Figure 4. Medical Malpractice Cases: Components of Total Defense Cost



Annual outside counsel expense, inside counsel expense, and other loss adjustment expense, as percentage of total defense cost for all nonduplicate medical malpractice cases in the BRD_{minus} dataset.

Table 6 reports the results of a probit analysis of the likelihood of using inside counsel, outside counsel, or both, based on factors that are likely known when an insurer is making this decision. The independent variables include several case variables (does the case involve an injured baby (which can proxy for large potential damages), brain damage (same), and death), as well as dummy variables for type of defendant (physician are the omitted category). Since the choice of inside or outside counsel is binary, the coefficients in regression (1) are opposite in sign from the coefficients in regression (2). Cases with larger expected exposure, as proxied by indemnity reserve, are not more likely to be sent to outside counsel. On the other hand, cases with higher maximum exposure, proxied by policy limits, are more likely to go to outside counsel. Yet cases with multiple defendants are more likely to go to inside counsel. These mixed results should be seen as tentative because they largely reflect the decisions of a single insurer. Still, the differences between medical malpractice and other types of cases (see Figure 7 and related discussion) suggest that there is danger in generalizing about the factors that affect choice of counsel.[44]

[44] Compare Hersch & Viscusi (2007), who study the factors that affect use of counsel, but combine all types of cases in a single regression. They include case type dummy variables, but do not interact these dummy variables with other independent variables of interest.

Table 6. Medical Malpractice Cases: Use of Inside vs. Outside Counsel

	(1)	(2)	(3)
Dependent variable	inside counsel only	Outside counsel only	both inside and outside counsel
Year	**-0.0052 (-12.25)*** **	**0.0047 (8.53)*** **	**0.0007 (3.84)*** **
ln(policy limits)	**-0.0193 (-8.31)*** **	**0.0163 (5.67)*** **	0.0003 (0.40)
ln(indemnity reserve)	0.0006 (0.41)	-0.0019 (-0.96)	-0.0005 (-0.83)
dummy multiple defendants	**0.0238 (3.95)*** **	**-0.0156 (-2.05)** **	-0.0035 (-1.52)
no. of other defendants	**0.0076 (5.44)*** **	**-0.0107 (-6.01)*** **	-0.0004 (-0.62)
baby dummy (age <1)	**0.0261 (3.34)*** **	**-0.0256 (-2.67)*** **	-0.0014 (-0.48)
death dummy	**-0.0131 (-2.77)*** **	**0.0190 (3.21)*** **	0.0020 (1.15)
brain damage dummy	**-0.0349 (-4.74)*** **	**0.0400 (4.13)*** **	0.0012 (0.33)
hospital dummy	**-0.0848 (-11.27)*** **	**0.0775 (9.08)*** **	**0.0068 (2.15)** **
nursing home dummy	-0.0080 (-0.80)	**-0.0306 (-2.43)** **	**0.0166 (4.27)*** **
dummy for other defendant types (other than physician)	-0.0188 (-1.90)*	-0.0038 (-0.30)	0.0042 (1.04)
Constant	yes	yes	yes
sample size	14776	14776	14776
obs. with dependent variable = 1	1473	12782	170
Pseudo R^2	0.0628	0.0303	0.0316

Probit regressions of probability of using inside counsel, outside counsel, or both, on indicated independent variables for medical malpractice claim reports in the BRD_{minus} dataset in which suit was filed. Coefficients are marginal probabilities, computed at the mean value of all independent variables. All regressions use 1988 dollars and White's heteroskedasticity-consistent standard errors. *, **, *** indicates significance at the 10%, 5%, and 1% levels, respectively (suppressed for constant term). Significant results at 5% or better in **boldface**.

F. Decomposition of Defense Expenses

Table 7 provides separate regressions for the components of defense costs for which we have data -- outside counsel expense, inside counsel expense, total counsel expense, and other loss adjustment expense -- using the same independent variable as in Table 3. Outside counsel, inside counsel, and other expense costs rise at similar rates (4.8%, 3.4%, and 5.5% per year respectively), and are generally affected by the same factors as overall defense spending**.** Ln(payout), suit filed dummy, trial started dummy, number of other defendants, and ln(days claim open) predict higher spending across all components. Ln(policy limits) and the presence of multiple defendants also predict higher spending for outside counsel and other loss adjustment expense. The results for inside counsel should again be seen as tentative because they largely reflect one insurer's experience.

Table 7. Medical Malpractice Cases: Components of Defense Costs

	(1)	(2)	(3)	(4)
Dependent variable	ln(outside counsel cost)	ln(inside counsel cost)	ln(total counsel cost)	ln(other expense)
Year	**0.048**	**0.034**	**0.048**	**0.054**
	(31.41)* **	**(5.04)*** **	**(32.71)*** **	**(25.08)*** **
ln(payout)	**0.261**	**0.217**	**0.260**	**0.331**
	(35.97)* **	**(9.59)*** **	**(37.80)*** **	**(33.94)*** **
ln(policy limits)	**0.064**	0.014	**0.070**	**0.031**
	(8.29)* **	(0.43)	**(9.43)*** **	**(3.24)*** **
dummy (suit filed)	**1.48**	**1.93**	**1.54**	**1.29**
	(23.46)* **	**(9.45)*** **	**(25.30)*** **	**(21.01)*** **
dummy (trial started)	**0.606**	**0.548**	**0.605**	**0.641**
	(14.09)* **	**(4.38)*** **	**(14.98)*** **	**(11.77)*** **
dummy (full trial)	0.029	0.168	0.023	-0.119
	(0.45)	(0.99)	(0.39)	(-1.38)
dummy appeal	0.073	**0.506**	0.123	0.012
	(0.85)	**(3.47)*** **	(1.53)	(0.09)
dummy multiple defendants	**0.048**	-0.072	0.030	**0.079**
	(2.33) **	(-0.96)	(1.50)	**(2.82)*** **
No. of other defendants	**0.016**	**0.057**	**0.018**	**0.019**
	(3.03)* **	**(4.20)*** **	**(3.73)*** **	**(2.67)*** **
ln(days claim open)	**0.634**	**0.757**	**0.644**	**0.679**
	(38.87)* **	**(14.01)*** **	**(41.66)*** **	**(30.28)*** **
Constant	-0.329	-0.579	-0.521	-2.144
	(-1.98)	(-0.93)	(-5.42)	(-9.96)
sample size	13391	1527	15,094	12,605
overall adj. R^2	0.3889	0.4028	0.3878	0.3400

Regressions of ln(outside counsel cost), ln(inside counsel cost), ln(total counsel cost), and ln (other expense) on indicated independent variables for medical malpractice claim reports with positive defense costs in the BRD_{minus} dataset. Regressions (1) and (2) include only reports that have no inside (outside) counsel costs reported, respectively. All regressions use 1988 dollars, county fixed effects and White's heteroskedasticity-consistent standard errors. *, **, *** indicates significance at the 10%, 5%, and 1% levels, respectively (suppressed for constant term). Significant results at 5% or better in **boldface**.

V. Comparing Medical Malpractice to Other Personal Injury Litigation

The Texas database includes closed claim reports for bodily injury covered by four lines of commercial insurance in addition to medical malpractice professional liability: general commercial, automobile, multi-peril, and other professional liability. We next consider the extent to which the factors that predict defense costs are similar across these five areas. Table 2 above provides summary statistics for each area.

A. Factors Predicting Defense Costs

Table 8 reports results for different lines of insurance, from regressions similar to those in Table 3. The sample is all closed claim reports (rather than all nonduplicate cases) because we can match duplicate and individual reports only for medical malpractice cases. Regressions (1-5) cover each area separately. Regression (6) includes all reports, with dummy variables for type of insurance (general commercial liability is the omitted category) and an interaction term between BRD_{minus} and year. Panel A reports time trends conditioned only on ln(payout) (similar to Table 3, regression (2)). In unreported regressions similar to Table 3, regression (1), the unconditional

coefficients on year are essentially the same as those reported in Panel A. The time trend is insignificant for other professional liability, which could reflect a relative small sample size and thus higher standard errors. Defense costs rise in all other types of cases, with the rate of increase ranging from 1.5% in auto cases to 2.7% in commercial multi-peril cases The overall rise in defense costs in non-medical-malpractice cases is 2.2% per year, compared to 4.6% in medical malpractice defense costs. In regression (6), the med-mal versus non-med-mal difference is captured by the 2.4% coefficient on the interaction term BRD_{minus}*year.

In Panel B, we add a family of independent variables. The changes from Table 3, regression (4) are (i) we combine the partial trial and full trial dummy variables (full trial dummy is insignificant if included), and (ii) we drop number of other defendants, which is insignificant for non-medical-malpractice cases.[45] The factors that predict defense costs are otherwise similar across areas. The negative coefficient on automobile dummy in regression (6) indicate that auto cases tend to be small, relative to the omitted category of general commercial liability. The increase in defense costs in non-medical-malpractice cases, conditioned on our full set of claim and resolution stage characteristics, is 3.2% per year, compared to the unconditional rate of 2.2%. Defense costs rise significantly faster in medical malpractice cases, as indicated by the 1.9% coefficient on the interaction term BRD_{minus}*year.

[45] Following Hersch & Viscusi (2007), we exclude from our dataset 1,375 cases closed in 1997 which were covered by general commercial liability with "other products manufacturer" as the defendant type, most of which were apparently paid by a single insurer on behalf of a single defendant.

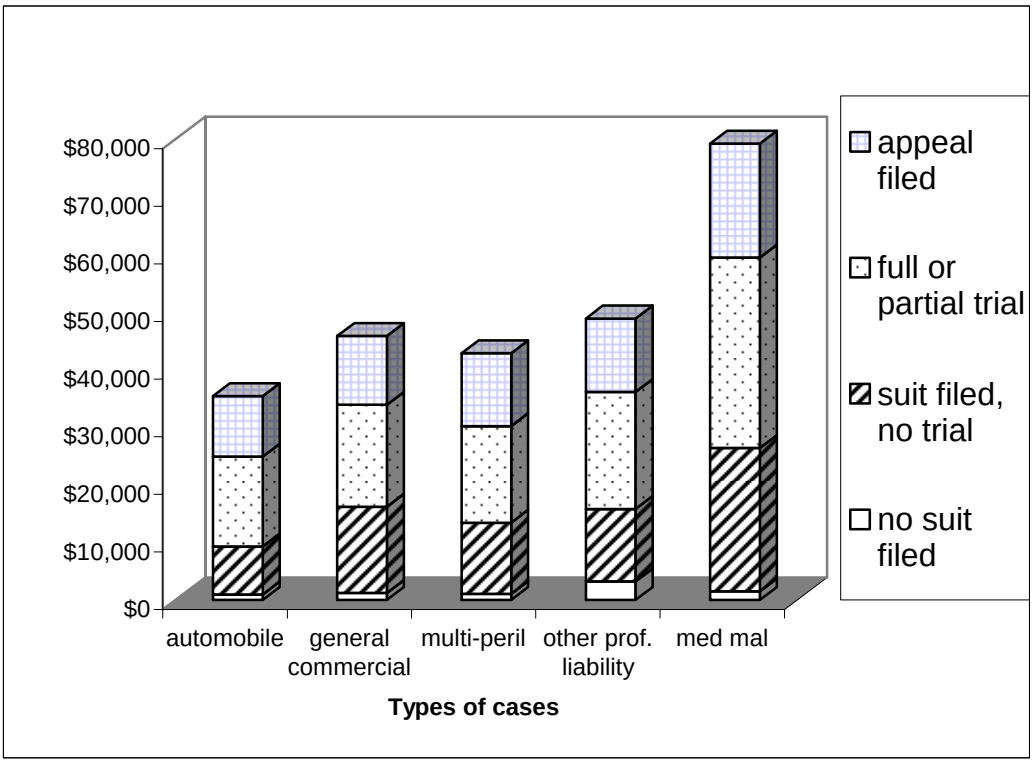
Table 8. All Personal Injury Cases: Factors Predicting Defense Costs

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Variable	**Ln(defense cost)**					
Sample	**automobile**	**general commercial**	**multi-peril**	**other prof. liability**	**med mal (BRD_{minus})**	**All cases**
Panel A: Time trend and ln(payout)						
Year	**0.024**	**0.015**	**0.027**	0.009	**0.045**	**0.022**
	(11.98)***	**(6.65)*****	**(9.31)*****	(0.92)	**(21.88)*****	**(16.42)*****
BRD_{minus} * year						**0.024**
						(9.83)***
ln(payout)	**0.569**	**0.527**	**0.548**	**0.437**	**0.399**	**0.515**
	(61.72)***	**(57.91)*****	**(47.19)*****	**(10.63)*****	**(44.23)*****	**(107.08)*****
case type dummies	No	no	no	no	no	yes
Constant	Yes	yes	yes	yes	yes	yes
overall adj. R^2	0.1378	0.1824	0.1837	0.1436	0.1555	0.2433
Panel B: Full controls						
Year	**0.031**	**0.033**	**0.034**	**0.032**	**0.051**	**0.032**
	(18.51)***	**(16.33)*****	**(14.35)*****	**(3.82)*****	**(31.55)*****	**(28.78)*****
BRD_{minus} * year						**0.162**
						(8.33)***
ln(payout)		**0.445**	**0.456**	**0.345**	**0.303**	**0.018**
		(53.90)***	**(44.14)*****	**(9.52)*****	**(40.89)*****	**(9.45)*****
ln(policy limits)	**0.493**	**0.099**	**0.055**	**0.086**	**0.051**	**0.429**
	(63.27)***	**(8.42)*****	**(2.72)*****	**(2.22)****	**(6.56)*****	**(102.76)*****
dummy (suit filed)	**0.088**	**2.0**	**1.94**	**1.57**	**1.91**	**0.075**
	(9.70)***	**(33.89)*****	**(31.44)*****	**(7.47)*****	**(35.93)*****	**(14.84)*****
dummy (trial started)	**1.665**	**0.574**	**0.612**	**0.626**	**0.593**	**1.796**
	(61.54)***	**(16.64)*****	**(13.68)*****	**(3.91)*****	**(19.31)*****	**(87.27)*****
dummy appeal	**0.789**	0.106	-0.028	0.249	0.106	**0.672**
	(24.99)***	(1.36)	(-0.25)	(0.66)	(1.45)	**(38.89)*****
dummy multiple	0.075	**0.168**	**0.175**	0.020	**0.095**	0.068
defendants	(0.81)	**(9.38)*****	**(8.09)*****	(0.26)	**(5.77)*****	(1.49)
ln(days claim open)	**0.241**	**0.531**	**0.600**	**0.610**	**0.705**	**0.171**
	(12.23)***	**(30.30)*****	**(28.72)*****	**(9.61)*****	**(40.19)*****	**(18.37)*****
dummy BRD_{minus}						**0.606**
						(70.11)***
dummy automobile						**-0.428**
(not BRD_{minus})						**(-35.44)*****
dummy multi-peril (not						**-0.079**
BRD_{minus})						**(-5.79)*****
dummy other prof.						**0.275**
liability (not BRD_{minus})						**(8.29)*****
Constant	Yes	yes	yes	yes	yes	yes
sample size	24,107	15,607	9,888	896	13,730	64,228
overall adj. R^2	0.4659	0.4054	0.4576	0.4051	0.5098	0.5088

Regressions of ln(total defense cost per case) on indicated independent variables for closed claim reports in the TDI dataset of personal injury claims closed from 1988-2004 with positive defense costs and payout > $25,000 in 1988 dollars. Regressions (1-4) exclude cases in the BRD_{minus} dataset of medical malpractice cases. In regression (6), the omitted category is general commercial liability cases (excluding BRD_{minus}). All regressions use 1988 dollars, county fixed effects and White's heteroskedasticity-consistent standard errors. *, **, *** indicates significance at the 10%, 5%, and 1% levels, respectively (suppressed for constant term). Significant results at 5% or better in **boldface**.

Figure 5 shows median defense costs, by resolution stage and type of case. Results for means are similar. Across case types, claims that are settled before suit is filed are cheapest to defend. Once a suit is filed, expected cost jumps, as does the likelihood that the insurer will retain counsel. There is another jump for cases that go to trial (whether completed or not), and for cases that go to an appeal. We caution, however, that we cannot infer causation. Unobserved complexity may drive both expenses and stage of resolution.

Figure 5. Defense Costs by Type of Case and Stage of Resolution



Median defense costs for closed claim reports in the TDI dataset of personal injury claims closed from 1988-2004 with positive defense costs and payout > $25,000 in 1988 dollars.

Medical malpractice cases are significantly more expensive to defend than other cases. Figure 6 also reflects median costs for our entire sample period, and thus understates the differences at the end of the sample period. As Table 8 shows, the disparity between medical malpractice and the first three areas also exists if we control for other factors that predict defense costs.

B. Expense Reserves in Non-Medical Malpractice Cases

We saw in Part IV.E that medical malpractice insurers did not adjust their expense reserves to reflect increasing defense costs. Figure 6 provides evidence that insurers in other lines *did* update their reserves as defense costs rose. Figure 6 is structurally similar to Figure 4. It shows mean per case defense costs and initial reserves for non-medical-malpractice cases by year, normalized to their respective means during 1988-1990. Defense costs and reserves rise, roughly in parallel. Reserves fall somewhat behind expenses for closed claims during 1992-

1997, as insurers reduce per-case reserves while expenses gradually rise. But initial reserves catch up in 1998-2000, and remain similar to expenses thereafter.

Figure 6: Non-Medical Malpractice Cases: Normalized Mean Defense Costs and Initial Reserves

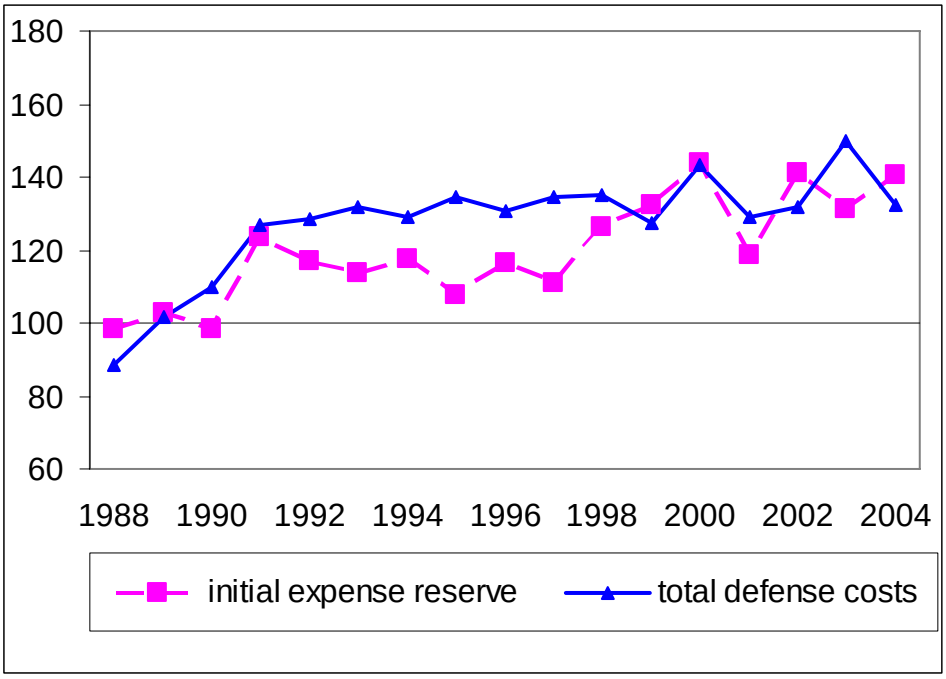


Figure shows : (i) mean per-case initial expense reserve for each year, normalized to a mean of 100 over 1988-1990, and (ii) mean per claim defense costs, similarly normalized relative to 1988-1990, for non-medical-malpractice claim reports in the TDI dataset of personal injury claims closed from 1988-2004.

Insurers have greater ability to predict case-level defense costs for cases that do not involve professional liability. The adjusted R^2 for a simple regression of ln(defense cost) on ln(expense reserve) plus a constant term is .085 for commercial multi-peril, 0.088 for auto, and 0.112 for general commercial, compared to 0.027 for other professional liability and only 0.014 in medical malpractice cases (see Table 4). The adjusted R^2 for the same regression for non-medical malpractice cases is 0.144. It is unclear whether this is because insurers in non-professional liability cases were objectively better at predicting expenses, expenses were more predictable in these cases, or both.

C. Use of Inside Versus Outside Counsel

Across types of cases, the vast majority of spending on counsel goes for outside counsel. The ratio of total cost for outside counsel cost to total cost for all counsel is 92.3% in medical malpractice cases, and otherwise ranges from 94% in multi-peril cases to 96.5% in general commercial cases (see Table 2, Panel B). Non-medical malpractice cases show a time trend toward greater use of inside counsel (in contrast to the medical malpractice results reported in Table 6). However, the economic significance of this trend is limited. The marginal effects estimate from a probit regression similar to Table 6, regression (1), with dummy variables for type of case, is 0.22% per year ($t = 7.71$).

Hersch and Viscusi (2007) argue that insurers tend to send more complex and larger cases to outside counsel. As we noted above, this claim is not supported for medical malpractice cases. In contrast, in non-medical malpractice cases, bigger cases (proxied by indemnity reserve) are more likely to go to outside counsel. As Figure 7 shows, the probability of using inside counsel declines from 15% to 4% as ln(indemnity reserve) varies from 7 to 14 ($1,000 to roughly $1 million). The probability of using both types of counsel is roughly constant, at about 4%. Medical malpractice aside, the trend toward using outside counsel in larger cases is similar across all types of cases.

Figure 7: Non-Medical-Malpractice Cases: Probability of Using Inside Counsel

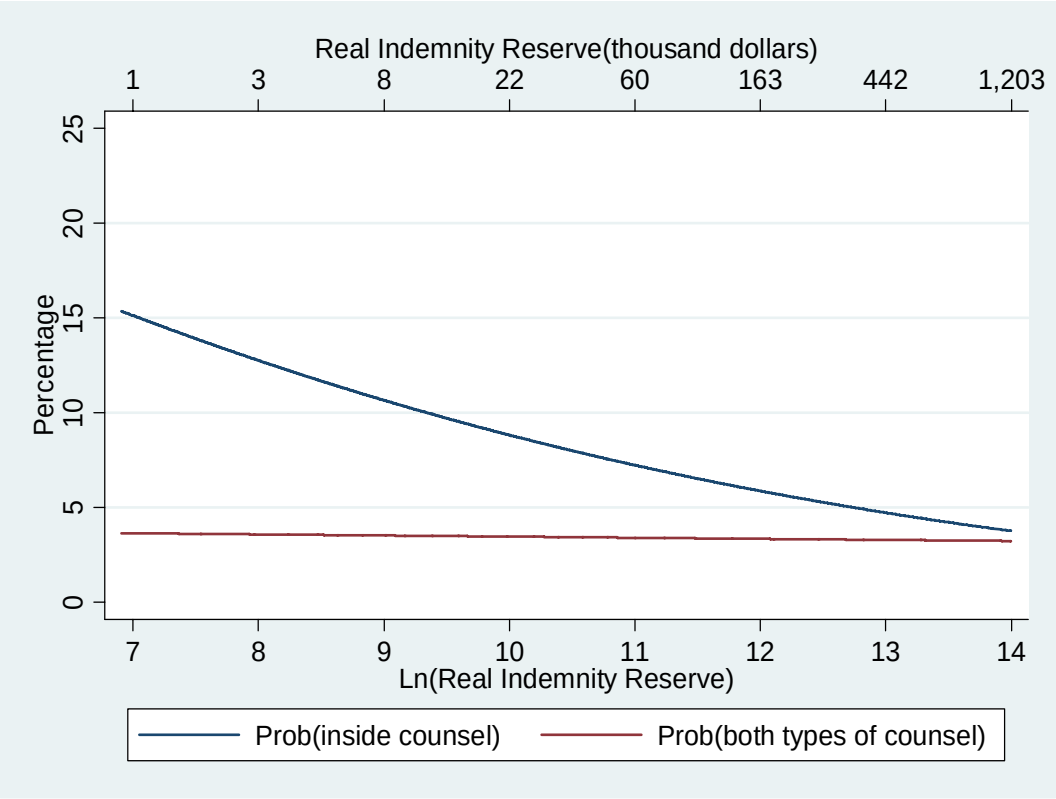


Figure shows probability of using inside counsel, and both inside and outside counsel, for non-medical-malpractice claim reports in the TDI dataset of personal injury claims closed from 1988-2004. Lines are based on probit regressions similar to Table 6, regressions (1) and (3), but including case type dummies as independent variables. Marginal effects coefficient on ln(indemnity reserve) in inside counsel regression is -0.0103 (t = -15.09).

D. Trial Rates

Across all areas, large paid claims tried to verdict varied only moderately as a percentage of large paid claims, ranging from 2.7% (auto and med mal) to 3.6% (other professional liability) (see Table 2, panel B, last row). However, there are larger differences in trial rates as a percentage of all claims. We lack data on how many trials produce defense verdicts, so we cannot directly measure the likelihood that a case will go to trial. However, we can estimate the trial rate by assuming that:

- If the plaintiff wins at trial, the likelihood that the payout will be $10,000 (nominal) or more is close to 1. This assumption should be reasonable since cases with small expected payoffs are unlikely to go to trial.

Under these assumptions, the trial rate equals:

$$trial\ rate = \frac{(\frac{\text{trial wins}}{\text{observed wins}})*(\frac{\text{observed wins}}{\text{total claims}})}{(\frac{\text{plaintiff wins}}{\text{trials}})} \approx \frac{(\frac{\text{trial wins}}{\text{total claims}})}{(\frac{\text{plaintiff wins}}{\text{trials}})}$$

Here, the numerator is known. We estimate the denominator, based on other studies, at roughly 0.25 for medical malpractice and other professional liability, and 0.50 for other areas.[46]

Table 9 shows the assumed plaintiff win rates, and the estimated trial rate (ratio of trials with large payouts to large paid claims)*(ratio of large paid claims/all claims)/(fraction of plaintiff wins), for 1995-2004. Trials are uncommon even in medical malpractice cases, but are significantly more common for medical malpractice than for other types of cases (*t*-statistic for difference in proportions = 4.14). The trial rate would surely be higher if the denominator were lawsuits, rather than claims. We cannot estimate the trial rate, as a fraction of suits filed, because we lack data on the number of lawsuits.

Table 9. Estimated trial rates

	(1)	(2)	(3)	(4)	(5)
Line of insurance	**automobile**	**general commercial**	**multi-peril**	**other prof. liability**	**med prof. liability**
Total claims	544,640	435,593	190,236	19,816	77,575
Plaintiff trial wins (payout > $10,000 (nominal)	692	260	211	20	209
Trial wins/total claims	0.13%	0.06%	0.11%	0.10%	0.27%
Assumed plaintiff win rate	0.50	0.50	0.50	0.25	0.25
Estimated trial rate	0.25%	0.12%	0.22%	0.40%	1.08%

Summary data for personal injury claims and nonduplicate plaintiff trial wins with payout > $10,000 (nominal), closed from 1995-2004 in the TDI database of commercially insured personal injury claims and annual aggregate insurer reports. Duplicate reports are identified by us for BRD_{minus} cases and by TDI for other cases. Claims are classified based on line of insurance.

The higher trial rates in medical malpractice cases contribute directly to higher defense costs. They may also contribute indirectly, by influencing behavior in cases which are later settled.

VI. Five Factors That Might Explain Rising Defense Costs – But Don't

Why are defense costs rising? Consistent with the model of defense costs we presented earlier, there are five plausible possibilities which we can test:

[46] For medical malpractice cases, see Cohen (2004) (plaintiff win rates for 1992, 1996, and 2001 surveys ranged from 22-30%, with mean of 27%). For state tort trials generally, see Cohen & Smith (2004) (51% overall plaintiff win rate in jury trials, which implies a roughly 55% win rate in non-medical-malpractice cases)..

- Real hourly legal fees might be increasing;
- Real payouts might be rising;
- Cases might be taking longer to close;
- Cases might be resolved at a later procedural stage;
- Insurers' maximum exposure, proxied by policy limits, might be increasing.

We examine each of these possibilities in turn.

A. Defense Counsel Hourly Rates

Outside counsel expense is by far the largest component of defense cost. In our simple model, outside counsel expense has two components: hourly fees and hours spent. The TCCD contains no information on either subject, but we are able to obtain data on hourly fees from another source. The Texas State Bar conducted six surveys of hourly rates charged by attorneys during the period 1988-2005. We have median fees for all years, and mean fees for some years, for both personal injury defense counsel and all counsel. The survey design changed over time, so we cannot be sure that results for different years are comparable.

Table 10 reports mean and median hourly rates for personal injury defense counsel and all counsel. Hourly rates for personal injury defense counsel fluctuated, but ended up almost unchanged in 2005 versus 1989. Thus, it does not appear that a rise in hourly rates explains the rise in defense counsel cost. There could, of course, be a divergence over time between the hourly rates for personal injury defense counsel reported on the Texas bar survey and the blended average rates paid by insurers, or a divergence between rates charged by medical malpractice defense counsel and other personal injury defense counsel. But there is no obvious reason to expect either source of divergence, and it seems unlikely that any divergence can explain more than a fraction of the increase in defense costs. This leaves more hours worked as the likely source of much or all the increase in counsel fees. If we assume that counsel cost = (hours worked) * (hourly rate), and that hourly rates were constant, the 5% annual rise in counsel cost for medical malpractice cases (controlling for case characteristics) implies that hours per case more than doubled over our time period. The increase for other types of cases was smaller but still substantial.

Table 10 also shows mean and median rates for all respondents. The all-respondents series is less noisy due to larger sample size, but likely less representative of personal injury defense counsel. It shows an increase in median fees of about 1% per year from 1989-2005. Even if this increase also applied to personal injury defense counsel, it would explain only a fraction of the rise in counsel costs, especially for medical malpractice cases.

Table 10. Defense Counsel Hourly Rates

Year	Personal Injury Defense Counsel			All Counsel		
	median	mean	sample	median	mean	sample
1989	104.9			111.6		1,389
1994	111.8	111.0	292	111.8	116.5	4,186
1996	94.3	103.3	478	113.1	116.1	2,300
2000	103.1	100.3	22	120.2	135.3	1,038
2003	96.4		45	128.6	144.0	2,705
2005	106.0	107.2	37	130.2	141.7	2,414
Annual increase	**0.06%**	**-0.31%**		**0.97%**	**1.80%**	
Period covered	1989-2005	1994-2005		1989-2005	1994-2005	

Median and mean hourly fees charges by personal injury defense counsel, and all counsel, for indicated years, in 1988 dollars Data is from Texas State Bar surveys for indicated years.

B. Payouts

Higher payouts are associated with higher defense costs, so if payouts increase over time, defense costs should increase as well. In our earlier study, we found that per-claim payouts were roughly constant over 1988-2002.[47] In unreported regressions, we extend this analysis through 2004, with similar results. In a regression of ln(payout) versus year and constant term, year has an insignificant coefficient of 0.23% per year (t = 1.15). Thus, rising payouts cannot directly explain rising defense costs. We cannot assess whether payouts would have risen if insurers had not increased their defense spending.

C. Length of Time Open

Another possible source of rising defense costs is an increase in the time it takes to resolve cases. Length of time open predicts larger defense spending (see Table 3, regression (4) and Table 8, Panel B).

Our data does not support this hypothesis. Table 11 reports results from a regression of ln(days claim open) against year, ln(payout), and constant term. Medical malpractice, other professional liability, and general commercial cases have been closing more quickly over time; there is no significant trend for auto or multi-peril cases. In medical malpractice cases, which have the strongest trend toward higher defense costs, mean (median) days open dropped from 1029 (912) over 1988-1992 to 888 (781) over 2000-2004.

One might expect that larger cases, and more complex cases, take longer to resolve. Table 11 confirms this expectation for cases with larger expected damages, controlling for case type. In contrast, we do not find a clear relationship between complexity and resolution time.. Recall from Table 2 that medical malpractice cases are more complex than general commercial and multi-peril cases, measured both by number of defendants and by mean or median payout, yet do not take longer to resolve. Auto cases are the simplest case type, yet are resolved only slightly faster. In unreported regressions similar to Table 11, but including a multi-defendant dummy, this dummy predicts longer resolution time for medical malpractice and other professional liability cases, but not for other types of cases.

[47] Black, Silver, Hyman, and Sage, *Stability, Not Crisis* (2005).

Table 11. All Personal Injury Cases: Length of Time Open

	(1)	(2)	(3)	(4)	(5)
dependent variable	ln(days claim open)				
Sample	automobile	general commercial	multi-peril	other prof. liability	med mal (BRD_{minus})
Year	0.001 (1.87)*	**-0.007 (-6.73)*** **	0.000 (0.30)	**-0.029 (-5.36)*** **	**-0.006 (-5.21)*** **
ln(payout)	**0.050 (13.25)*** **	**0.052 (11.65)*** **	**0.069 (11.22)*** **	**0.080 (3.35)*** **	**0.050 (10.46)*** **
Constant	5.961	6.179	5.824	5.868	6.102
	(137.35)*	(116.79)	(80.93)	(21.21)	(102.28)
sample size	31933	17592	11594	972	14241
overall adj. R^2	0.0057	0.0111	0.0120	0.0421	0.0096
Cuzick test for trend	1.02	**-10.14*** **	-0.77	**-5.98*** **	**-7.82*** **
(p value)	(0.308)	**(0.0000)**	(0.440)	**(0.0000)**	**(0.000)**

Regressions of ln(days claim open) on year, ln(payout) and constant term for cases in the TDI dataset of personal injury claims closed from 1988-2004 with payout > $25,000 in 1988 dollars. Regressions (1-4) exclude cases in the BRD_{minus} dataset of medical malpractice cases. All regressions use 1988 dollars, county fixed effects and White's heteroskedasticity-consistent standard errors. *, **, *** indicates significance at the 10%, 5%, and 1% levels, respectively (suppressed for constant term). Significant results at 5% or better in **boldface**.

D. Stage of Resolution

Claims cost more to defend if a suit is filed, and are especially expensive if they get to trial (see Figure 6). Thus, a higher proportion of claims resulting in suits, a higher proportion resulting in trials, or both could produce rising defense costs. In fact, there was no increase in the fraction of cases resolved after a suit or in the fraction of large paid claims which involved a full trial. Indeed, the rate of increase in defense costs is *larger* if we control for time open, stage of litigation, and other factors that predict defense costs, both for medical malpractice (compare Table 3, regressions (2) and (4)) and for other areas (compare Table 8, Panels A and B).

Although increased trial rates and increased claims cannot explain increased defense costs, in unreported regressions we find a substantial increase in the percentage of cases resolved with ADR. ADR is often promoted as reducing litigation cost, but could result in increased defense costs if it requires more attorney time than if the case settled without ADR. We expect to explore the use of ADR and its effect on defense costs in future research.

E. Policy Limits

Insurers spend more to defend cases with larger policy limits – so if limits were rising, this would predict rising defense costs. In fact, we find in another study that limits are falling over time, at least for medical malpractice cases against physicians.[48]

[48] Zeiler, Silver, Black, Hyman, and Sage, *Policy Limits* (2007) (finding that limits were roughly constant in nominal dollars, but declined substantially in real dollars).

VII. Discussion

We discuss below some implications of our results, focusing on medical malpractice cases.

A. Rising Defense Costs Over Time

We find a strong trend over time toward higher defense costs. The rate of increase is stronger for medical malpractice (4.6% per year) than for other types of personal injury cases (2.2% per year), but is present across types of cases. Over 1988-2004, real defense costs in medical malpractice cases more than doubled, while defense costs in other types of cases rose by about 40%.

As noted above, we can largely rule out a number of possible causes of the rise in defense costs, including rising payouts, rising hourly rates, claims staying open longer, cases being settled at a later stage, and rising policy limits. Several other explanations for increasing defense costs are possible. Payouts and defense costs are jointly determined by underlying claim and tort system characteristics. Perhaps payouts would have risen if insurers had not spent more per claim to defend them. Second, plaintiffs' attorneys may have selected stronger cases over time or invested more resources in case development, forcing insurers to respond.[49] Two additional explanations are specific to Texas. Texas adopted legislation in 1987 to encourage counties to adopt ADR, and in 1995 to restrict who could be an expert in a medical malpractice case. One or both of these changes may have increased defense costs.

Evidence from other states is mixed (see Part II). The sustained rise in defense costs deserves further attention from researchers and policymakers. We know of no significant academic or public discussion of time trends in defense costs. Some insurers have complained about rising defense costs, but have offered no data and have pointed the finger of blame at runaway tort awards. In Texas, that explanation lacks empirical support. If the rise in defense costs reflects a national trend, we need to understand the root causes. If it is limited to some states, we need to understand the factors that cause the differences in state trends.

B. Insurer Reserves for Medical Malpractice Defense Costs

Perhaps our most surprising finding is on insurer reserves for defense costs in medical malpractice cases. Per-case defense costs for these cases doubled over our sample period, both in dollars and as a percentage of payout, yet per-case reserves did not increase. Indeed, per-case reserves were somewhat lower at the end of the period than at the beginning. In contrast, per case reserves for other types of cases generally kept pace with the increase in defense costs.

Defense costs are a significant portion of medical malpractice insurers' costs. By 2004, average defense spending for the large paid claims in our sample was roughly 18% of payouts. A plausible estimate, based on other studies, is that defense costs in unobserved low-or-no-payout cases are 40-45% of total defense cost. If so, total defense cost would be 30-33% of payouts and 23-25% of insurer total cost.[50] Yet we find no evidence that medical malpractice

[49] In an earlier article, we find evidence that medical malpractice cases with smaller payouts are declining in frequency. Black, Silver, Hyman, and Sage, *Stability, Not Crisis* (2005).

[50] In Studdert et al. (2006), 40% of defense costs ($30M out of $76M) were incurred in cases with no payout. Applying this percentage to our dataset, the .177 ratio of defense cost to payout we find in 2004 (see Figure 1)

insurers adjusted their reserve estimates to reflect risingnoticed the rise in defense costs. This suggests remarkable inattention by medical malpractice insurers to a central aspect of their business -- reserving accurately for defense costs. The constant ratio of expense reserves to indemnity reserves (see Figure 2) are consistent with medical malpractice insurers relying on a rule of thumb – that expenses reserves should be a roughly constant percentage of indemnity reserves when averaged over a reasonable number of cases – and not updating their target ratios even though defense costs were steadily increasing relative to payouts. A business adage states that "you manage what you measure." For at least some Texas medical malpractice insurers, this should perhaps be modified to "you manage what you measure, if you notice."

C. The Efficiency of Medical Malpractice Litigation

The tort system is widely thought to be an expensive way to transfer resources from defendants to plaintiffs. Our findings provide information on how expensive the system actually is. We estimated above that total defense costs likely equal about 30-33% of observed payouts. If we assume that the median plaintiff's legal fees and expenses are 35% of the indemnity payout,[51] then the per-case efficiency of the system is roughly 50%.[52] Stated differently, it costs about a dollar in legal fees and expenses for the plaintiff to end up with $1 in his pocket.

Insurers also have administrative and other overhead costs, and some defendants may not report their expenses to TDI. If we assume that insurers' overhead costs are 15% of payouts plus defense costs,[53] per-case efficiency including these costs will be on the order of 43%.

D. The Choice Between Inside and Outside Counsel

Insurers' choice between outside counsel and staff counsel reflects a standard "make or buy" decision about the boundaries of the firm. Rising defense costs or other changes in the legal environment might provide the impetus for insurers to rethink these choices.

Despite steadily increasing legal expenses, we find no evidence that medical malpractice insurers are moving toward greater use of staff counsel. Indeed, the two largest insurers of physicians do not use inside counsel, and the one insurer that switched in the 1980s to inside counsel later switched back to using mostly outside counsel. At least in Texas, there is no

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implies an overall ratio of defense cost/payout of .293. Adding a bit for expenses in cases with defense spending < $2,000 (which Studdert et al. exclude from their sample), the overall ratio of defense cost/payout could be ~ 30%, which implies a ratio of defense cost/(payout + defense cost) of 0.23. In the State of Washington (2005) report, 46% of defense costs were incurred in cases with zero payout over 2000-2004. The implied ratio of defense costs/payout for our sample is .327, to which one must add a bit for defense costs in cases with payout from $1 to $25,000. The implied ratio of defense cost/(payout + defense cost) is ~ 0.25. In the State of Connecticut (2007) report, 38% of defense costs were incurred in cases with zero payout over 2005-2006. Adding a bit for defense costs in cases with payout from $1 to $25,000, the implied ratio of defense cost/(payout + defense cost) is ~ 0.23.

[51] Studdert et al. (2006) estimate plaintiff's legal fees and expenses at 35% of indemnity payouts. Similar estimates, which assume plaintiffs' counsel charge a 33% contingency fee, and then add a bit for expenses, are common. See, e.g., Brickman (2003). We are currently studying plaintiff-side legal fees and expenses in medical malpractice and other personal injury litigation. Our preliminary results indicate that 35% is conservative.

[52] Per case efficiency is defined as follows: (indemnity payout - plaintiff's legal fees)/(indemnity payout + defense costs). In the example in the text, this equals (1-0.35)/(1+0.30), or 0.65/1.30 = 0.50.

[53] Kessler (2006) estimates these costs at 14.3% of incurred costs for indemnity and expenses.

evidence that medical malpractice insurers believe inside counsel offers a solution to the increases in defense costs.

The picture is less clear for non-medical malpractice cases, where the increase in defense costs is also less steep. Although outside counsel are responsible for the overwhelming majority of spending on attorneys across all types of cases, there is a clear tendency to use inside counsel more often in smaller cases (proxied by ln(indemnity reserve) and a modest trend toward increased use of inside counsel.

E. Policy Implications: What Can We Learn From Changes in Malpractice Premiums?

Texas malpractice insurers more than doubled their rates during 1999-2003. Insurers, physicians, and legislators blamed the tort system and out-of-control juries, and pushed for tort reform. Texas ultimately adopted a cap on non-economic damages in medical malpractice cases of $250,000 (nominal), plus other reforms intended to restrict tort claims. In an earlier study, we found that payouts per large paid claim and the number of large paid claims were stable during 1988-2002.[54] In research for this article, with two more years of data, we find the same results.[55] Indemnity reserves as a fraction of payouts fluctuated, but gently (see Figure 3). There was steady deterioration in the ratio of expense reserves to defense costs, but the growth in defense spending was gradual -- not the stuff an insurance crisis is made of. Finally, in another article, we found no evidence of dramatic changes in jury trial outcomes during 1988-2004.[56]

The implication is that policymakers should not treat changes in medical malpractice insurance premiums as reliable signals of changes in the litigation environment. In the long run, insurer costs surely predict premiums. But the long run may be rather long, and insurance cycle swings along the way can be large and only loosely connected to cost trends. The 2003 Texas tort reforms were a reaction to the rate spike, and claims by insurers and physicians that the rate spike reflected changes in medical malpractice exposure. In fact, based on closed claim data through 2004 (well after rates soared in 1999-2000), the rate spike far exceeded what one can explain based on changes in the number of new claims or in per claim payout experience.[57]

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[54] See Black, Silver, Hyman, and Sage, *Stability, Not Crisis* (2005).

[55] *See also* Texas State Board of Insurance (1987) (finding no strong time trend in payouts from 1983-1986, covering the previous medical malpractice insurance crisis). Due to different criteria for collecting reports, we cannot combine the 1983-1986 results to those for 1988-2004, to estimate a time trend for the full period.

[56] See Hyman, Black, Zeiler, Silver, and Sage, *Haircuts* (2007).

[57] Insurers may have raised premiums partly in response to a modest rise in per claim payouts in 1999 and 2000. Per claim payouts by the primary insurer rose in 1999 and 2000 (and then largely subsided by 2001), but this rise -- perhaps 15-20% relative to a multiyear average -- cannot explain a doubling of rates. And if this rise prompted rate increases, the downtick in 2001 should have prompted decreases. Instead, insurance rates continued to rise sharply in 2002 and 2003.

There was also a gradual decline in the ratio of indemnity reserves/payout over roughly 1993-2000 (see Figure 3). But this decline is not nearly large enough to explain the doubling of premiums over 1999-2003, much of it predates the rise in premiums, and it is itself puzzling. In unreported regressions, we find that payout per claim rose by 1.2% per year over 1993-2000, while indemnity reserves *fell* by 0.5% per year. This pattern is at least as consistent with an insurance cycle explanation for the dramatic rise in premiums that began in 1999 as an expense-driven explanation. Recall too that we find no evidence that medical malpractice insurers responded to rising in defense costs by raising their expense reserves.

E. Policy Implications: Defense Cost Reserves and the Insurance Cycle

We study here only defense costs and expense reserves, and do not study indemnity reserves. We have data on defense costs only for large paid claims, and thus cannot directly assess the adequacy of expense reserves. However, insurers' failure to carefully track changes in an important source of overall cost could contribute to an "insurance cycle" in medical malpractice premiums.[58] In such a cycle, insurers systematically under-price in "soft" markets; something (perhaps losses in this or another line of insurance, investment returns, or other factors) shocks the market; insurers rapidly raise rates to above-equilibrium levels (a "hard" market), insurers then compete their way down to under-pricing again, the next shock strikes and the cycle repeats. Insurer inattention to expense reserves is consistent with conventional accounts of the insurance cycle.

F. Policy Implications: Improving the Efficiency of the Tort System

The sustained rise in defense costs deserves attention from researchers and policymakers. The increase implies that our tort system, never a model of efficiency in providing compensation to injured persons, has become worse at this task over time. To be sure, the optimal level of spending on litigation is not known, and higher spending might produce more accurate outcomes or greater care (and hence fewer injuries).[59] Still, system efficiency is an important measure of tort system performance, and the rise in defense costs has thus far escaped public notice. We know of no significant academic or public discussion of this trend. Some insurers have complained about rising defense costs, but have offered no data and have pointed the finger of blame at runaway tort awards. In Texas, at least, that explanation lacks empirical support. We have also excluded most of the other obvious causes of increased defense costs; further research will be necessary to determine why costs are increasing across all lines of insurance and particularly rapidly for medical malpractice. One possibility that remains to be explored is the significance of past tort reforms in driving these increases.

One obvious strategy for increasing the efficiency of the tort system is to resolve cases more quickly, and at an earlier stage of litigation. Early offers of settlement are one possible way to speed early resolution. The U.S. Department of Health & Human Services is currently using such a program, although no results have been reported.[60] Programs that combine early disclosure and apology are another avenue that should be explored, although increases in the number of claimants may swamp the potential savings in litigation transaction costs.[61]

VII. Conclusion

We have explored the factors that influence per-case defense costs in medical malpractice and other personal injury cases. We found a steady rise in defense costs across all types of cases, with the highest increase in medical malpractice cases, where defense costs more than doubled

[58] See Baker (2005) (discussing reasons why the insurance cycle might be especially severe in medical malpractice).

[59] Silver (2002).

[60] Department of Health & Human Services (2004).

[61] Studdert, Mello, Gawande, Brennan & Wang (2007).

over our sample period. Medical malpractice insurers failed to adjust their reserving practices to reflect this change, in contrast to insurers in other areas.

The reasons for rising defense costs are unclear. We have ruled out a number of possible explanations, including rising payouts, rising lawyer hourly rates, claims staying open longer, cases settling at a later stage, and rising policy limits. Regardless of the cause, higher defense costs imply that the efficiency of the tort system has steadily declined over time.

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