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DAMAGES : ESTIMATING PRODUCT LIABILITY

Access to reliable forecasts of product liability claims gives lawyers and corporate executives a critical lever with which to drive settlement and litigation strategies. Far too often, back-of-the-envelope estimates prove to be off the mark. Despite the fact that these cases often have accumulated huge amounts of scientific and claimant data, we find that few stakeholders typically use the available data to estimate potential damages.

In this issue, we describe analyses that can be used to develop sound estimates and identify some of the common types of problems encountered. Two case studies are presented: one for a medical device damages valuation and one for an asbestos damages assessment.

For more information on The Brattle Group's work in the area of product liability and/or insurance recovery, please contact Gayle S. Koch in Cambridge at 617.864.7900.

INTRODUCTION

The number of product liability cases in the United States has been exploding over the past several years. In many instances, product liability claims can result in extended litigation and/or bankruptcy. Plaintiffs, defendants, and their insurers have a need to assess correctly the magnitude and nature of this exposure in order to manage risk, structure and price insurance, and estimate the value of a litigated matter to determine appropriate settlements and strategies.

At the heart of a product liability case are two questions: what is the likelihood that plaintiffs will be successful in pursuing their case, and what is the total dollar value of claims likely to be? Understanding the answers to these two questions requires knowledge of a wide range of sub-issues: the likelihood of class certification; the types of injuries claimed; the strength of the link between the defendant's actions and the claimed injuries; the expected awards (if any) by type of injury; the possibility of punitive damages; the expected litigation costs; and the allocation of liability among parties, including insurers.

Since each of these uncertainties may have many possible outcomes, the range of a company's product liability exposure can be wide. This can make it very easy for a company to be blind to potential small-probability, extreme-outcome events. Or it can cause firms in settlement negotiations to focus on the extreme small-probability events rather than on a probability-weighted outcome.

Fortunately, there is a framework that puts structure on the problem of correctly assessing a company's exposure. The framework involves using a combination of event trees and statistical analyses. Once constructed, an event tree enables companies to manage their litigation risk effectively, develop and evaluate settlement offers with confidence, improve their negotiating position, and structure and price insurance settlements. This newsletter draws on *The Brattle Group*'s significant experience in quantifying these types of liabilities and describes the techniques used.

THE ANALYTICAL FRAMEWORK

When companies face product liability claims, the main issues of interest are liability, which is often a mixture of some individual successes and failures on sub-issues, and an estimate of the total dollar value of expected awards. In theory, calculation of the expected award value could be as simple as multiplying the expected number of claimants by the damage award per claimant. In reality, however, such oversimplification may obscure and mask important underlying issues.

Event trees help to structure the issues underlying products liability cases. The figure below presents a typical summary event tree for a product liability case. The issues, listed at the top of the table, could begin with whether the claim truly becomes a case (*e.g.*, it passes the statute of limitations test, the class is certified), proceed with whether scientific studies have established a valid link between the product and the alleged injury, and continue with whether the company is found liable. Other issues, such as whether there are multiple defendants in the suit and how damages should be allocated, also are likely to be present. By carefully analyzing the relevant case facts and the relationship between issues, the potential outcomes under each scenario can be estimated.

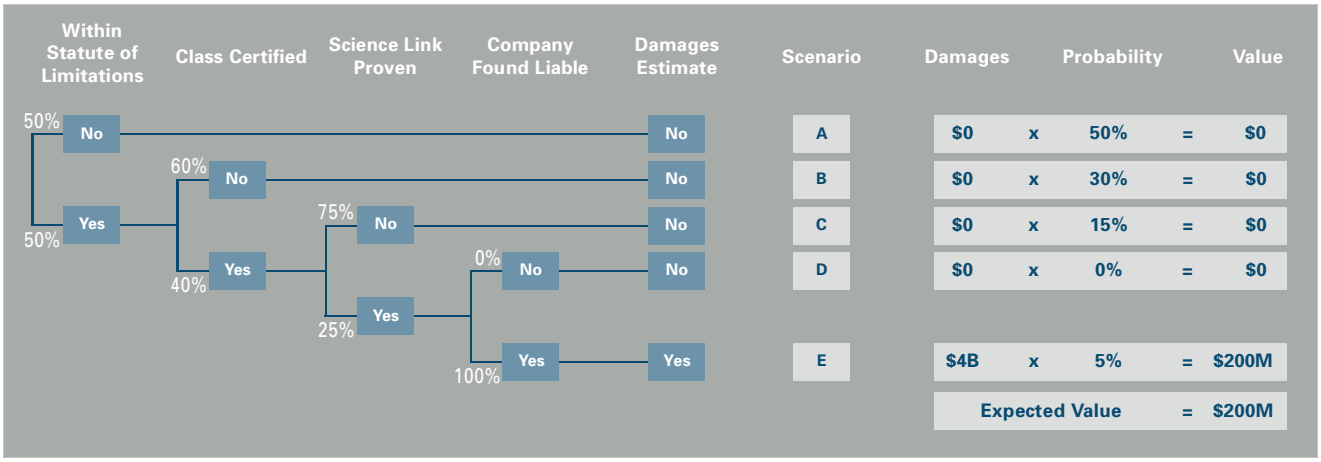
The likelihood of each possible scenario can be assessed based on the judgment of members of the litigation team, informed by statistical data where available. In the example shown in Figure 1, Scenario A may occur with 50% probability, Scenario B with 30% probability, Scenario C with 15% probability, Scenario D with 0% probability, and Scenario E with 5% probability. Even though there is only a 5% chance of plaintiff success in the example, the damages in that case would be $4 billion, and the expected value is a still-considerable $200 million.

Once all of the scenarios and likelihoods are developed, a final damage estimate can be calculated. This damage estimate is an average of all possible outcomes weighted by their likelihood, in this case amounting to $200 million. The event tree analysis puts structure on a highly uncertain, complex problem, breaking it into manageable parts. This organized framework helps management to evaluate the issues systematically, highlights critical issues, and offers a more developed perspective on the case.

ESTIMATING DAMAGES

The following sections provide an overview of the series of steps associated with product liability damages estimation, from initial data collection (if a history of similar claims exists) to calculation of the estimates.

Figure 1 An Event Tree Captures the Range and Likelihoods of Potential Outcomes



Scenario	Damages		Probability		Value
A	$0	x	50%	=	$0
B	$0	x	30%	=	$0
C	$0	x	15%	=	$0
D	$0	x	0%	=	$0
E	$4B	x	5%	=	$200M
	Expected Value			=	$200M

Collecting the data

Typically, company-specific historical claims data can be evaluated as a basis for predicting future claims. Collecting these data is the first step in characterizing the potential claimant population. The more robust the underlying data are, the more credibility an estimate will have.

Available data tend to come from several distinct sources — internal company databases are most common. However, historical claims data from the company may be insufficient or have gaps. Also, the company may have collected the data in an inconsistent manner due to changes in personnel or software, which can create additional analytical problems (*e.g.*, duplicate claims). Preliminary review and analysis early in the process can identify gaps or problematic data, and alternative data sources can be explored. The data may be supplemented with epidemiological literature, technical journals, and other public sources or expert opinion.

Medical product liability suits often have extensive epidemiology studies that may have identified incidence rates for diseases or mortality rates. In the case of warrantied products, such as tires, a large warranty database may exist that shows geographic and/or demographic patterns of usage.

Technical journals often contain aggregate data or charts which may provide an industry overview, possibly including statistics on the product's distribution as well as market shares for individual producers.

Claims data for other similar companies or products may be useful for comparison. Publicly available reports (*e.g.*, 10-Ks) and expert reports from prior litigation may provide useful information on claims statistics.

Calibrating the data

Some data sets require calibration to obtain accurate damages estimates. For example, there may be a need to calibrate the data in epidemiology studies if the samples relied upon do not correspond to the potential claimant population. Studies may focus on a subsection of the population such as a particular region or a particular age range that is not necessarily representative of the potential claimant population.

When historical sales, production, or warranty data are used, these data must be adjusted to reflect only the number of people who actually consumed the product. For example, multiple sales to one individual must be excluded, as must the sales to distributors that were not in turn sold to an individual consumer. If not adjusted properly, estimates of the exposed population could produce flawed damage estimates.

Estimating the potential claimant population through cohort analysis

Knowing the distribution of claimants against relevant factors is critical for preparing a damage estimate. However, often the only data on the distribution of the potential population may be several years or even decades old.

In these cases, we can be reasonably certain that the population distribution represented in the studies is not the same as the potential claimant population. For example, if 20 years have passed, standard mortality rates will have altered the current population. Thus, we need to take a known distribution at a point in time and move that distribution forward into the relevant claim period.

This process is called a "cohort analysis." The outcome is a potential claimant population, distributed by relevant factors such as symptoms, diseases, age, initial year of exposure, and/or duration of exposure.

Estimating the expected claimant population and dollar value of claims

Not all potential claimants will actually file a claim. The expected claimant population therefore must be determined. The expected claimants may fall into one of several categories: asymptomatic, lightly/moderately symptomatic, or severely symptomatic. Those who are symptomatic would be more likely to file a claim than those who are asymptomatic. In a class action, those with the most severe diseases may feel that they have a chance at a higher amount if they opt out of the

class, so the potential liability from the opt-out population may be a significant portion of the total potential liability.

The strength of the relationship between the disease and the product also plays a role. For example, if medical experts agree that a particular type of illness is associated with use of a particular medical device, those in the potential claimant population with this particular illness would be more likely to attribute their disease to the medical device. This would likely result in a greater probability of filing a claim.

Other factors such as geographic locality can play a part in the probability that a potential claimant will make a claim. People in different areas of the country may have different levels of awareness, different access to counsel, different propensities to sue, or may be influenced by different precedent-setting cases. Once the expected claimant population is estimated, those figures must be translated into dollars by estimating an amount per claim.

If a number of cases have been decided already, then a statistical analysis of the factors that are associated strongly with damages can be made and, assuming that those factors also are available for the population distribution, damages can be predicted on a case-by-case basis. If an insufficient claim history exists, it may be reasonable to estimate an amount per claim by examining amounts from other recent, similar suits.

COMMON MISTAKES

The following section describes some of the common pitfalls encountered in estimating product liability damages.

Relying on instinct

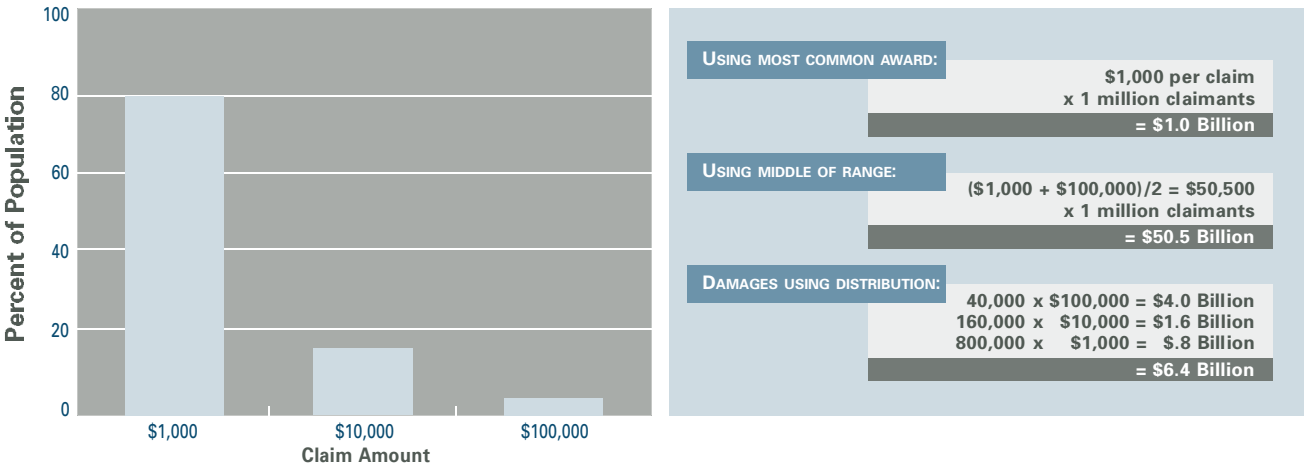
There is little reason to rely on instinct in complex matters when hard data exist. Rather, use of tools like event trees and/or statistical analyses provides a defensible, rational basis for estimates and sometimes counter-intuitive results.

Using the mid-point between minimum and maximum (or using the mode rather than the mean)

To address the uncertainty that is associated with forecasts, it is best to estimate more than just the number that is most likely to occur. Instead, an entire distribution can be estimated as shown in a simple example in Figure 2. This way, the range of possible outcomes is captured, and a probability-weighted expected value can be estimated within the range.

In this example, using the most common value of $1,000 per claimant (the mode) results in a total damages estimate of $1 billion. Using the midpoint between the high and low amount results in a total damages estimate of $50.5 billion. Compare these results to a weighted-average estimate which would give $6.4 billion in expected damages.

Figure 2 Chosen Approach Changes Damages Estimates



Ignoring key drivers of trial outcomes

Not understanding the key drivers of past case outcomes and trends can be another source of error. For example, geographic location may be a strong factor due to differing jurisdictions. Another important driver, scientific knowledge, evolves over time and may affect the value of claims in the future through precedents. For example, in one particular product liability case, the initial science was uncertain, leading to a wide range of outcomes. Over time, the science more strongly substantiated the defendant's case, leading to lower or zero damage awards in many cases. Using an historical average of case outcomes would have led to much higher estimates of future outcomes than appropriate.

Not following cohorts

Not using cohorts can lead to estimates that are unreliable. For instance, if normal mortality is not properly taken into account, then estimates may indicate greater damages than appropriate simply as a result of the population not shrinking over time. Improperly estimating age also can lead to miscalculation of likely symptoms and the damages associated with those symptoms. Finally, injury/mortality rates of the class must be compared to the same rates for unaffected populations to derive the marginal impact of the product under consideration.

CASE I *Estimation of Damages for a Medical Device Manufacturer*

The Brattle Group developed a model to estimate total liability of claims against a medical device manufacturer who was besieged with product liability lawsuits. The model used statistics concerning the population at risk as well as claimant and class opt-out population statistics to develop a total expected liability and distribution.

Model inputs included age distributions and mortality rates and accounted for differences in mortality rates for certain cancer patients and the exposed population at large. A cohort analysis was performed to apply appropriate mortality rates to the age distribution over time to obtain the potential claimant population. Next, the potential claimant population was calibrated to match published estimates of the population who used the medical device.

Because patients with particular symptoms were more likely to file a claim, disease incidence rates were applied to estimate the disease-distribution of potential claimants. This population was then calibrated to match the number of patients filing legal claims. The medical device manufacturer had only a fraction of the market share, so this was factored into the calculation. Finally, the total expected liability was estimated in dollars for each claim year using a distribution of dollar amounts per claim, by disease severity and age. This was combined with an estimate of the expected litigation result per claim for the patients who opted out of the settlement process. The resulting liability projections, largely based on publicly available information, formed the basis of a successful settlement negotiation.

CASE II *Estimation of Asbestos Damages for Insurance Settlement*

The Brattle Group developed estimates of asbestos liabilities for an insurer of a company that manufactured and distributed a product containing asbestos. The company's historical asbestos claims experience was used as the basis of future projections. The claims data first were assessed by years of exposure, dates of filing and resolution, geographic location, and disease type (mesothelioma, lung cancer, and various non-malignant diseases). Average settlement values per claim by year and by disease type were computed from the company's claims database. The historic claim dismissal rate was tabulated by year by reviewing claims settled by the company at a $0 value. Historic defense costs were reviewed by year relative to indemnity costs and the number of settled claims.

The Brattle Group calibrated standard forecasting models to the company's historical information on claims and costs. Once the liability had been forecasted, the amounts were allocated to the company's insurance policy hierarchy. Sensitivity analyses investigated the impact of various trigger and allocation

assumptions as well as coverage discounts. In addition, the model allowed for discounting based on the quality of claims as determined by audits of claim documentation. Careful design of claims database audits was critical in accurately evaluating claim quality. From the range of allocation results, the insurer could then assess settlement offers and propose alternatives with confidence. The results were a defensible, successful settlement, at an amount significantly different than the initial demand, but acceptable to all parties.

CONCLUSION

This has been a brief overview of appropriate techniques for estimation of product liability claims. The large amount of data that typically exist, whether company-specific or in the general or scientific press, can be used in these cases to develop more accurate and reliable figures upon which litigation and settlement strategies can be based.

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RELATED *BRATTLE* ARTICLES

The Brattle Group has published several articles on product liability, toxic torts, and insurance claim valuation, including:

- *Toxic Torts: The Science of Estimating Damages*
- *Damages Valuation and Settlement Analysis for Mass Toxic Tort and Product Liability Claims*
- *Controlling Costs and Improving Performance: Strategic Analysis of Litigation*
- *Breaking the Impasse: Structured Analysis to Mediate Insurance Disputes*

For copies of these articles, please contact us at publications@brattle.com.

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- *Economics: Current Topics in Economic Litigation and Strategy*
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