Automobile Accident Compensation

Volume I: Who Pays How Much How Soon?

John E. Rolph
With James K. Hammitt, Robert L. Houchens, Sandra S. Polin

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Foreword

The only direct involvement most Americans are likely to have with the civil justice system results from an automobile accident. Roughly two-thirds of civil litigation in most states involves automobile accidents; every year hundreds of thousands of people seek redress for injuries suffered in such accidents, and vast amounts of money are awarded to them in compensation. The effectiveness and equity of the system for compensating auto accident victims are clearly major policy concerns, and they are the focus of our research on auto accident liability and compensation.

Taken together, the Institute's four-volume series on automobile accident compensation analyzes the interactions between legal liability and the mechanisms that compensate for automobile injuries. Taken alone, this first volume summarizes the Institute's findings concerning who pays automobile accident compensation, how much they pay, and how soon they pay it. It describes the sources, amounts, and timing of payments by insurers and analyzes how these payments vary according to differing statutory and common law rules.

Although civil litigation is dominated by auto accidents, only a small fraction of total claims are litigated; most legal research has tended to focus on the even smaller fraction of cases tried to verdict or appealed. Our analysis is based on a set of claims resolved with and without recourse to litigation, thus reflecting the real world. It provides realistic, empirically documented answers to many questions that legislators and other policymakers ask again and again whenever they deliberate concerning changes in the laws of liability. Is an automobile accident victim more likely to be paid in a state that relies on the tort system or in one that relies on some version of the no-fault system? How much compensation does he get, who pays him, and how promptly does he get paid under these differing systems? Does it matter if the injured victim was partially at fault? Does it matter if the state allows only seriously injured victims to have access to the courts? Does retaining an attorney ensure higher compensation? Do claims that are settled out of court receive less money than those that go to trial?

In some cases, our analysis confirms conventional wisdom; in other cases, it challenges it. The research does not argue in favor of one kind of compensation system or another. Rather it provides the kind of empirical evidence needed to inform the judgments of legislators and other policymakers when considering such changes as instituting no-fault insurance, changing negligence rules, increasing benefit limits for no-fault claims, and changing tort thresholds.

Providing decisionmakers with such broadly based empirical evidence is one of the main objectives of the Institute for Civil Justice. Serious analysis of public policy alternatives requires the kind of analytic breadth and depth found in this study and in its accompanying volumes. We recommend this work to all readers interested in how the civil justice system currently works and in proposals for changing the way it handles automobile accident compensation cases.

Gustave H. Shubert
Director, The Institute for Civil Justice

Summary

Over the past several decades, the 50 states have in effect developed 50 different systems for compensating the victims of automobile accidents. Different liability rules and insurance laws determine how much compensation an injured victim can collect and from whom. In spite of no-fault schemes introduced in many states and recent changes in negligence and financial responsibility rules, critics continue to question whether these compensation systems provide fair and efficient treatment for accident victims.

This study uses statistical methods to compare how different rules affect accident victims' compensation—who pays, how much is paid, and how soon is it paid? As a consequence, this empirical study focuses exclusively on outcomes. It does not ask whether states *should* change from third-party redress (the tort system) to first-party comprehensiveness (no-fault insurance). Rather, it compares state accident compensation systems by asking whether an accident victim is more likely to be paid, and by contrasting the amount and timing of one system with another. Such comparisons aim at estimating how specific changes in existing rules might affect compensation to automobile accident victims for their injuries. This research should help inform current debates among state legislators, the courts, federal officials, and other policymakers about changing the rules governing automobile accident compensation.

Our study is based on our in-depth statistical analysis of two data sets collected in 1977 by the All-Industry Research Advisory Council (AIRAC), an insurance industry group. The AIRAC closed claims data set contains detailed information on 21,119 closed claims made under third-party bodily injury (BI) insurance policies and on 19,665 closed claims made under first-party personal injury protection (PIP) insurance policies. To keep the size of our study of the closed claims data manageable, we chose six states (California, Washington, North Carolina, Maryland, Massachusetts, and New Jersey) for in-depth analysis of BI claims and five states (Michigan, Pennsylvania, New Jersey, Massachusetts, and Maryland) for in-depth analysis of PIP claims. The AIRAC consumer panel data set contains detailed information on 1,849 injured accident victims who, in response to a nationwide survey of approximately 60,000 individuals, stated that they or members of their family had been in an automobile accident during the previous 24 months.

The closed claims data set and the consumer panel data set complement each other. The closed claims data are comprehensive and of high quality, but cover only those accident victims who received payments from the two types of automobile insurance policies; and, even for those victims, information on other sources of compensation is spotty at best. By contrast, the consumer panel data set is less reliable (because it is self-reported), but it potentially covers all accident victims and all of their sources of compensation.

To estimate how changing a particular law would affect compensation outcomes, ideally one should either compare outcomes before and after that law was changed in a state or compare outcomes in two similar states whose systems differ only with respect to that law. In

general, data for such before-and-after comparisons are available only in limited settings,[1] and the different accident laws, kinds of automobile accidents, demographic characteristics, and the like make it impossible to find two states that differ only with respect to a single law. As a consequence, our study uses statistical models to adjust for differences among states.

This report arrives at several findings concerning compensation outcomes, some that confirm conventional wisdom and some that do not. For example, we find that states with no-fault provisions differ from those with the traditional tort system in three commonly accepted ways:

1. Victims in no-fault states more often collect from first-party (PIP) automobile insurance than victims in other states.
2. Victims in no-fault states are more likely to receive some payment.
3. There is more consistency in payments in no-fault states in that the total amount of compensation a victim receives for a given economic loss varies less.

In addition, our study unearths four interesting findings about the size, timing, and incidence of bodily injury insurance payments:

1. When some payment is made, BI insurers almost always pay accident victims their full economic loss except where PIP insurance picks up part or all of the tab.
2. BI payments for general damages vary widely and do not obey anecdotal rules of thumb (such as that they are "three times" special damages).
3. BI insurance claimants who do not retain counsel get final payment in about the same time period as PIP claimants with similar claims; but an attorney's presence is associated with much longer times to settlement.
4. The frequency of BI insurance claims is considerably lower in no-fault states that have even modest tort thresholds.

Finally, this report illustrates the applicability of its statistical models by showing the consequences of three possible changes that might be made in a particular state's rules governing automobile accident compensation. Although this report uses Maryland as an example, any other state could be analyzed with equal ease and with the same methods.

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[1]Some limited data are available for states that have enacted no-fault laws—e.g., Florida. See Widiss et al. (1977), and Hammitt (1985) for a discussion.

Acknowledgments

This report draws substantially from its three companion volumes R-3051-ICJ, *Automobile Accident Compensation, Volume II: Payments by Auto Insurers*; R-3052-ICJ, *Automobile Accident Compensation, Volume III: Payments from All Sources*; and R-3053-ICJ, *Automobile Accident Compensation, Volume IV: State Rules*. The people acknowledged in those volumes also deserve thanks for their contributions to this report. The technical reviewers for the present report were Joseph Ferriera and Emmett Keeler. Their excellent suggestions resulted in substantial changes that we hope are improvements. Several knowledgeable people in the insurance industry read an earlier version and generously shared their insights with us. These include Donald Segraves, John S. Trees, and Rodger Lawson. Elizabeth Rolph and Mary Vaiana made helpful suggestions on structuring the report. Lynn Batten ably redrafted portions of an earlier version during the revision process. Helen Turin edited the report and Helen Rhodes provided excellent secretarial support. We thank all the above for their generous contributions; however they should not be held responsible for any shortcomings of the report.

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I. INTRODUCTION

The invention and widespread use of the automobile in the early twentieth century not only revolutionized the speed and propensity for travel in American society, but it also ushered in numerous new problems. During the 1920s, automobile registrations grew by over 20 percent per year while traffic deaths more than tripled to over 33,000.[1] The deluge of automobile accidents brought an accompanying barrage of disputes between parties who were usually strangers to one another. A flood of litigation resulted.

Faced with this litigation, states and their courts developed new methods for reaching tort judgments in automobile accident cases. Yet in spite of such changes, many of these methods shared what were often perceived as common shortcomings. As late as 1965, critics summarized the automobile accident compensation system by saying that "it provides too little, too late, unfairly allocated, at wasteful cost, and through means that promote dishonesty and disrespect for law."[2] Studies ranging from the Columbia Report of 1932 to the massive U.S. Department of Transportation Study of 1971 have suggested, for example, that the system tended not to fully compensate seriously injured victims for their losses and that it did not compensate a large percentage of the victims at all.

Even with more recent changes in the negligence and financial responsibility rules and the introduction of no-fault schemes in many states in the early 1970s, criticism of the automobile accident compensation system continues. Changes in no-fault laws continue to be proposed in many states including Pennsylvania, the District of Columbia, Massachusetts, Kansas, and Colorado.[3] The recent changes mean that the 50 states now have, in effect, 50 different compensation systems for automobile accident victims. Different liability rules and insurance laws affect how much an injured victim can recover and from whom. Do these changes actually result in fairer and more efficient compensation of accident victims? The purpose of this study is to use statistical methods to compare how different rules affect the victims' compensation outcomes—who pays, how much is paid, and how soon is it paid?

What should be the goals of a compensation system for victims of automobile accidents? Different commentators offer various answers,[4] but we group the goals into three categories:

- Deterring accidents
- Administering the system efficiently and justly
- Assuring that victims are suitably compensated.

Although liability rules can potentially affect how we drive, fear of injury, traffic citations, or uncompensated property damage probably are more important in *deterring accidents.* Indeed, some commentators (e.g., Klein and Walker, 1970) argue that most accidents are caused by factors outside an individual's conscious control. *Administering the system efficiently* includes cost effective administration of the courts, providing attorneys and claims adjusters, marketing insurance, managing expenses incurred by insurance companies, and the like. Just administration is difficult to define. However, at least two principles seem relevant: Those responsible

[1]California Citizens' Commission on Tort Reform (1977), p. 44.

[2]Keeton and O'Connell (1965), p. 3.

[3]Williams (1983).

[4]For example, Calabresi (1970) lists four goals: deterring accidents, distributing risk, minimizing administrative expenses, and providing justice.

for accidents should pay for the damage they cause, and similarly situated individuals should be treated alike. Finally, although *assuring that victims are suitably compensated* may appear to be the easiest goal to define, achieve, and measure statistically, the standard of what compensation level is suitable is normative and hence not obvious. The research described in this report develops evidence to assess the level of compensation provided by the different systems by comparing victims' losses with the amount of compensation they receive. Judging which system provides the most suitable compensation is left to the reader.

RESEARCH GOALS

The research described in this report tries to assess how changes in rules influence how automobile accident victims are compensated for losses *other than property damage*. Although previous studies have been conducted in both individual states and the country as a whole,[5] it has proved difficult to find sufficiently comprehensive data to fully achieve these aims. Our study uses statistical analyses of data on automobile accident compensation to assess how well accident victims fare under the rules of the different states.[6] In this research, we focus only on positive outcomes. Thus we do *not* address such normative questions as: Is the tradeoff between third-party redress (the tort system) and first-party comprehensiveness (no-fault insurance) worthwhile? Rather, we compare state systems by asking: How likely is an accident victim to be paid under each system and who pays him for his injuries? How much is the victim paid? How quickly is he paid? Our research should help inform the debate among state legislators, the courts, federal officials, and other policymakers about changing the rules governing automobile accident compensation.

DATABASE

As is common in many empirical studies, our research was shaped by available data sources. We were fortunate that the All-Industry Research Advisory Council (AIRAC),[7] an insurance industry group, carried out a comprehensive data collection effort and study of automobile injury compensation in 1977. Published in 1979, the AIRAC data offered us the opportunity to do an in-depth statistical analysis of how the sources, amount, and timing of compensation for automobile accident injuries vary with current state rules.

The AIRAC data used in our study consist of two data sets:

- *Closed Claims Data.* This set contains 21,119 claims closed under third-party bodily injury (BI) insurance policies and 19,665 closed claims under first-party personal injury protection (PIP) insurance policies during 1977. The data were collected nationwide during ten consecutive business days from 29 insurance companies representing about 62 percent of the U.S. private passenger automobile insurance market. Claims managers or supervisors in the field filled out survey forms from claims forms. The closed claim data give detailed information on the accident, the

[5]See Columbia Report (1932), U.S. Department of Transportation (1971), Haldi Associates (1972), Widiss et al. (1977).

[6]The present volume summarizes and discusses the implications of our study of automobile accident compensation. Our analysis is described in more detail in Hammitt (1985), Vol. II of this series, and Houchens (1985), Vol. III. Hammitt et al. (1985) describes the rules and provides an overview of the different systems of auto accident compensation.

[7]Formerly known as the All-Industry Research Advisory Committee.

insured vehicle, the claimant, the injury, the medical loss, the wage loss, the settlement process, and the amount and timing of payments.[8]

- *Consumer Panel Data.* This data set comes from a nationwide consumer panel survey in which approximately 60,000 people were asked "whether you or any other members of your household have been in an automobile accident in the past 24 months." This screening question identified victims who were asked for further information about their automobile accidents. This process yielded 1,849 automobile accident victims with injuries. Although this sample size is much smaller than that for the closed claims survey, it is richer. The data provide information on those victims who did not receive reimbursement from any source and on those who collected solely from nonautomobile insurance sources. Even for victims collecting from automobile insurance, the consumer panel survey includes data on what other parties also paid the victim. For each accident victim, the consumer panel survey gives detailed information on the sources and amounts of payments, the medical costs and wage losses, the victim's personal characteristics and characteristics of his injury, and the details of the settlement process.[9] Although we examined only part of the AIRAC data, we subjected them to a more extensive statistical analysis than had previously been done.

METHODOLOGY

To keep the size of our study of the *closed claims data* manageable, we chose six states for in-depth analysis of BI (liability) claims and five states for in-depth analysis of PIP (no-fault) claims. We selected states that spanned the range of important rules affecting compensation to automobile accident victims. In addition, we chose only states that had a sufficiently large number of claims for analysis. For analysis of BI insurance claims, we chose California, Washington, North Carolina, Maryland, Massachusetts, and New Jersey. For analysis of PIP claims, we chose Michigan, Pennsylvania, New Jersey, Massachusetts, and Maryland. The closed claims data required very little data editing because they contained few out-of-range values, missing items, and the like. One limitation of the closed claims data is that they cover only those accident victims who receive payments from automobile insurers, and, even for those victims, information on other sources of compensation is usually missing.

Although the *consumer panel data* partly overcome these limitations, they are self-reported and thus pose considerable quality problems. Some people failed to respond to the survey, and some of those who did respond failed to answer questions or gave invalid and inconsistent responses. For example, several questions asked about lost wages. One-third of the sample did not indicate the number of working days each family member missed as a result of the accident. Of those who indicated they missed some time, 10 percent failed to give their weekly salary, and 26 percent did not estimate the amount of lost wages. Before analyzing the consumer panel data, we did extensive data editing in which we used the data we had to impute missing, invalid, or inconsistent data wherever possible.[10]

Using closed claims data or consumer panel data to characterize state by state compensation to victims at first glance looks like a simple task of tabulating averages. However, states differ from one another in several aspects of accident laws, in mix of automobile accidents, in

[8]AIRAC (1979); and Hammitt (1985), Vol. II of this series, give more detailed descriptions of these data.

[9]Houchens (1985), Vol. III of this series, gives a more detailed description of these data and of the editing we did to them.

[10]The AIRAC analysis of the consumer panel data generally used the data "as is."

demographics, and so on. Because we want to isolate the effect of a particular change in the law *holding all else the same*, we must adjust for the effects of other state differences. Statistical modeling is one way to do this. For example, tabulated data would suggest that an accident victim has a 70 percent chance of collecting payment for general damages (pain and suffering, mental anguish, etc.) in North Carolina and a 96 percent chance in New Jersey. But such unadjusted averages are misleading because there are many differences between the two states' rules (including restrictions on access to the tort system and the availability of PIP benefits), and the victim's chance of collecting varies in the two states depending on the characteristics of the accident. A statistical model that adjusts for these differences arrives at very different conclusions: We estimate that a victim with a specified typical accident has a 95 percent chance of collecting general damages in North Carolina, but that same victim has a 98 percent chance in New Jersey.[11] This adjusted 95/98 comparison is far different from the unadjusted 70/96 difference.

FINDINGS

By fitting statistical models to the AIRAC closed claim data and consumer panel data to adjust simultaneously for multiple influences, this report arrives at several findings concerning compensation outcomes. Some confirm conventional wisdom, others do not. For example, we conclude that states with no-fault provisions differ from those with the traditional tort system in three important ways:

1. Victims in no-fault states more often collect from PIP automobile insurance.
2. Victims in no-fault states are more likely to receive payment from at least one source.
3. There is more consistency in payments in no-fault states because no-fault insurance does not pay for general damages. That is, the total amount of compensation a victim receives for a given amount of economic loss varies less.

In addition, our study unearths four interesting findings about the size, timing, and incidence of BI insurance payments:

1. BI insurers almost always pay special damages to accident victims covering their full economic loss except where PIP insurance picks up part or all of the tab.
2. BI payments for general damages vary widely and do not obey anecdotal rules of thumb (such as that they are "three times" special damages).
3. BI insurance claimants who do not retain counsel get their final payment by about the same time as do PIP claimants with similar sized claims, but an attorney's presence is associated with much longer times to settlement.
4. BI insurance claims are considerably less frequent in no-fault states with even modest tort thresholds.

[11]Based on a 30 year old accident victim with three days of lost work and $500 of medical expenses who retained an attorney. We used the maximum likelihood regression estimates given in Table D.1 of Hammitt (1985), Vol. II of this series.

II. STRUCTURING THE ANALYSIS

Our research aims at estimating how changing a particular aspect of an automobile accident compensation system (such as imposing a tort threshold) will affect compensation outcomes. Ideally it would be best either to compare outcomes before and after a threshold was introduced in a particular state or to compare outcomes from two similar states whose systems differ only in restricting a victim's right to sue. Unfortunately, data for such comparisons do not exist. We have therefore used statistical models to adjust for differences among states to compare compensation outcomes in dissimilar states.

Any attempt to assess how particular accident compensation rules influence outcomes is frustrated by needs to deal with:

1. The great diversity among state rules,
2. The extreme complexity of the decision process that litigants go through, and
3. The multiple variables that influence how the compensation rules operate.

DEALING WITH DIVERSITY AMONG STATE RULES[1]

No two states have exactly the same mixture of rules governing how automobile accident victims are compensated. Every state has a tort system where the automobile accident victim may be compensated by the party who is at fault or by that party's BI insurance. Some states rely solely on the tort system to handle automobile accident cases. These states are termed *tort states*. Other states restrict access to the tort system for certain automobile accident cases, mandate the purchase of PIP insurance by all drivers, and require that all automobile insurance companies offer PIP no-fault insurance. These states are termed *no-fault states*. Yet a third group of states does *not* restrict access to the tort system and requires that all automobile insurance companies offer PIP insurance (some of these states mandate the purchase of PIP insurance by all drivers; others do not). These states are termed *add-on states* because they add PIP insurance onto the tort system rather than partially substitute it for the tort system. See Table 1.

The first no-fault systems proposed in the late 1960s had three major components:[2]

- Elimination of tort liability
- Substitution of an alternative compensation mechanism
- Universal application of the alternative compensation mechanism.

The advent of automobile no-fault laws was motivated by the need for an alternative to the tort liability system. No-fault plans were aimed at supplementing the tort system (in add-on states) and partly replacing the tort system (in no-fault states) by providing quick and certain compensation for all automobile accident victims without having to determine fault. Massachusetts enacted the first no-fault plan in 1971; at this writing 24 states have no-fault plans.[3]

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[1]State rules are described in greater detail in Hammitt et al. (1985), Vol. IV of this series.

[2]Keeton and O'Connell (1965).

[3]This total excludes Nevada, which adopted a no-fault plan in 1974 but rescinded it in 1980.

Table 1

STATE COMPENSATION SYSTEMS FOR AUTOMOBILE ACCIDENT VICTIMS

Tort States	Add-on States	No-fault States
Unrestricted access to tort system	Unrestricted access to tort system	Restricted access to tort
	All insurance companies must offer PIP insurance	All insurance companies must offer PIP insurance
	Some states mandate all drivers carry PIP insurance and some do not	All states mandate all drivers carry PIP insurance

Without regard to legal negligence, PIP insurance compensates all occupants of the insured vehicle plus pedestrians and bicyclists injured by the vehicle. Compensation is provided only for certain economic losses, primarily medical expenses and lost wages, and only up to specified limits. However, the provisions of the various no-fault plans differ greatly.

Multiplicity of Rules

Tort Thresholds. In a no-fault state, a victim is not entitled to compensation under the tort rules unless his injuries are more severe than the "tort threshold." Tort thresholds may be verbal thresholds or dollar thresholds. All no-fault states have verbal thresholds. To satisfy a *verbal threshold*, the victim must incur injuries ranging from slight, such as "any injury not confined to soft tissue" in New Jersey, to severe, such as "serious impairment of body function," "permanent serious disfigurement," or death in Michigan. Florida, Michigan, and New York impose only a strict verbal threshold, and 12 other states also have a dollar threshold. To satisfy a *dollar threshold*, the victim must incur certain minimum medical expenses ranging from $200 (New Jersey, net of hospital expenses)[4] to $4,000 (Minnesota). The stringency of different tort thresholds, and thus the fraction of accident victims who are denied access to tort compensation, varies widely among states.

Insurance Purchase Requirements. Compulsory insurance purchase laws apply both to PIP insurance and to the traditional third-party liability or BI insurance. The rationale for universal coverage of PIP insurance is to assure compensation for economic loss to all victims without regard to fault. Compulsory purchase of BI insurance is aimed at eliminating "empty pockets" for victims in accidents where the other party is at fault. Massachusetts enacted a compulsory BI insurance purchase law in 1927, but most subsequent enactments of compulsory insurance purchase laws have been as part of no-fault plans. Of the 25 states with compulsory insurance laws, only seven do not have a no-fault law. However, all but Florida of the states with mandatory PIP purchase also mandate BI insurance purchase.

Setoffs and Collateral Source Rules. Automobile accident victims may have several potential sources of compensation. Besides BI and PIP automobile insurance, victims may

[4]In 1983, New Jersey established an optional stricter tort threshold. The new threshold is $1,500 in medical expenses (gross of hospital expenses) and includes a stricter verbal section. Policyholders may choose to be subject to the new threshold and pay smaller premiums.

collect from their health insurance, their employer, workers' compensation, and government insurance programs. As a result, many states have enacted rules governing "setoffs" of collateral sources. Under the common law, a plaintiff who is compensated for his injuries by another source, such as first-party insurance, can still collect the full amount from a negligent defendant. Some states' no-fault laws allow the PIP payment to be set off against the amount for which the BI insurer is liable, thereby preventing double payment for economic loss by PIP and BI insurers.

Negligence Rules. Tort states, add-on states, and no-fault states all have tort systems and use some kind of negligence rule. Under traditional common law, a defendant is liable if he is negligent and the plaintiff is not negligent. If the defendant is liable, he must compensate for all damages—special damages, such as medical expenses and lost wages, as well as general damages, such as pain and suffering. Between 1965 and 1975, more than half the states replaced the prevailing common law negligence rule, *contributory negligence*, with some form of *comparative negligence*.

Under *contributory negligence*, a plaintiff is barred from any recovery if he is even slightly negligent.[5] Many commentators have argued that this is unfair because a plaintiff's negligence may be inconsequential in causing his injuries, compared with the defendant's negligence.

Under *comparative negligence*, the plaintiff's allowable recovery is reduced but not necessarily eliminated if he is at fault. The size of the reduction depends on which of the four types of comparative negligence rule his state has:

- *Pure.* The pure comparative negligence rule allows some recovery from a negligent defendant regardless of the plaintiff's own negligence. However, the plaintiff recovers proportionately less. For example, if the plaintiff's damages were $10,000 and he was judged 90 percent negligent, he could recover $1,000. Twelve states had adopted this rule by 1984.
- *Modified (49 percent).* The 49-percent comparative negligence rule bars any recovery to a plaintiff if his negligence is 50 percent or greater. Otherwise, his recovery is diminished in proportion to fault, as under pure comparative negligence. Ten states had adopted this rule by 1984.
- *Modified (50 percent).* The 50-percent comparative negligence rule bars any recovery to a plaintiff if his negligence is greater than 50 percent. Fifteen states had adopted this rule by 1984.
- *Slight/gross.* The slight/gross rule is more an exception to the contributory negligence doctrine than a comparative negligence rule. If the plaintiff's negligence is judged to be "slight" compared with the defendant's negligence, this law does not bar recovery; rather, it proportionally diminishes the amount of damages. Two states had adopted this rule by 1984.

Proportioning liability among parties based upon the degree of fault is now the rule in 39 states. Its advocates argue that more injured victims are compensated through apportioning damages according to negligence without sacrificing deterrence. Partly negligent plaintiffs can collect something, but the proportionate reduction in amount should act as a deterrent to negligent behavior. Initially there was speculation that under comparative negligence it would

[5]To be negligent, the plaintiff's behavior must fall below the relevant standard of care and must be a legal cause of the injury (Prosser, 1971, Section 65).

be difficult if not impossible for juries to apportion liability among parties; this fear has largely subsided.

Clustering States

To study how changes in a state's rules might affect outcomes, we needed data from states with a wide range of different rules. Because it was impractical to fit detailed statistical models to the closed claims data from all 50 states, we restricted our analysis of closed claims to only a few states. As an aid, we grouped states with similar rules into fairly homogeneous clusters. Ideally, we would like to select states for analysis mostly from different clusters. Based on rules in effect in 1983, we created ten clusters of states as defined by four categories of rules:

- Tort restrictions
- Amount and availability of first-party PIP insurance benefits
- Negligence rules
- Compulsory liability insurance laws.

First, we divided states into two groups according to whether they have tort restrictions. As Table 2 shows, there are 15 tort-restricted states (the no-fault class).[6] Next, we subdivided no-fault and add-on states according to whether purchase of PIP insurance is mandatory. We distinguished among states with high, medium, and low first-party PIP benefits by using "break points" in an ordered list of amounts of maximum first-party benefits. "High" benefits are $50,000 or more or unlimited, "medium" benefits are $10,000 to $25,000, and "low" benefits are $5,000 or less. Because traditional tort states by definition do not have PIP insurance, we further divided them by the type of negligence rule—pure comparative, modified comparative (grouping the 49 percent and the 50 percent together), contributory—and whether they required the purchase of BI insurance.[7]

In choosing states for our closed claim analysis, we used the clusters in Table 2 and we also restricted ourselves to fairly large states to get accurate estimates of the parameters in our statistical models. With this constraint, we picked states that spanned the ranges of important rules. For *PIP coverage* we chose five states for analysis from Groups 1, 3, and 4—Michigan, Pennsylvania, New Jersey, Massachusetts, and Maryland. These large states include the extremes of the PIP limits and tort thresholds, and they include Maryland, an add-on state. For *BI coverage* we chose six states from Groups 1, 3, 4, 5, 6, and 9—New Jersey, Massachusetts, Maryland, California, Washington, and North Carolina. Besides giving good overlap with the PIP state selections, these six BI states have a diversity of negligence rules, compulsory insurance laws, and no-fault laws.

DEALING WITH THE COMPLEXITY OF THE DECISION PROCESS

There are two aspects of the process of compensating (or not compensating) the accident victim that we focus on in describing the extremely complex relationship between the outcomes of the automobile accident compensation system and the policies that affect them:

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[6]This is Table 4.1 of Hammitt et al. (1985).

[7]Delaware, Louisiana, and Washington end up in separate categories, so rather than define one-state groups, we classify each of these three states into the "nearest" group as indicated in Table 2.

Table 2

STATES GROUPED ACCORDING TO SELECTED AUTO ACCIDENT COMPENSATION RULES

Tort Threshold	No-Fault Insurance	Maximum No-Fault Medical Benefits		States		Group	Traditional Group
Yes	Mandatory	High ($50,000 or more)		Michigan New Jersey	New York Pennsylvania	Group 1	No-Fault States
		Medium ($10,000 to $25,000)		Colorado Florida Hawaii	Kentucky[a] Minnesota North Dakota	Group 2	
		Low ($5,000 or less)		Connecticut Georgia Kansas	Massachusetts Utah	Group 3	
No		Med. ($10 to $25,000)		Delaware[b]		Group 4	Add-on States
		Low ($5,000 or less)		Maryland	Oregon		
	Optional	Med. ($10 to $25,000)		Washington		Group 5	
		Low ($5,000 or less)		Arkansas South Carolina South Dakota	Texas Virginia		
		Negligence Rule	Compulsory Liability Insurance				
	Not Available	Pure comparative negligence	Yes	Louisiana		Group 6	Tort States
			No	Alaska California Illinois Iowa	Mississippi New Mexico Rhode Island		
		Modified comparative negligence	Yes	Idaho Montana Nevada	Oklahoma West Virginia	Group 7	
			No	Maine Nebraska[c] New Hampshire Ohio	Vermont Wisconsin Wyoming	Group 8	
		Contributory negligence	Yes	Arizona Indiana	North Carolina	Group 9	
			No	Alabama Missouri	Tennessee	Group 10	

[a]May reject first-party benefits in writing; then no tort restrictions.
[b]No tort restriction on initiation of lawsuits, but no evidence may be introduced for damages already compensated by first-party benefits.
[c]Nebraska has the slight/gross form of comparative negligence.

1. For a given potential source of compensation, we describe the sequence of *steps in the compensation process* that the victim goes through to determine whether he is paid by that source and, if so, the amount of payment and the delay.
2. We enumerate the various possible *sources of compensation* and describe what affects the mix of sources of a particular victim's compensation and its size.

Steps in the Compensation Process

Figure 1 depicts the process an accident victim goes through to determine whether he is paid by third-party BI insurance. Automobile insurance claims are almost always closed by settlement between the claimant and the insurer. Lawsuits are filed in only 20 percent of BI claims, and only 1 percent of BI claims are resolved by verdict. Although most claims are settled without resort to trial or arbitration, the settlements are influenced by the parties' estimate of the award that would be made if the claim went to trial and consequently by the rules influencing such awards.

The entries labeled "Policy" and "Individual" in Fig. 1 indicate the policies and factors that affect whether the victim of a particular accident drops out at a stage or goes further toward making a recovery from BI insurance.

The entries across the top of Fig. 1 indicate the four stages in the decisionmaking process:

1. Is insurance coverage available? If the other party does not carry BI insurance, the victim cannot collect from a nonexistent insurer although he may be able to collect from the other party. Compulsory BI insurance purchase and financial responsibility laws are policy levers that affect the likelihood of a potential claim dropping out at this step.

2. Does the victim pursue a claim? A single car accident or any other accident unambiguously not covered by a BI policy will not qualify, so the victim cannot pursue such claims. Similarly, in a state with a tort threshold, an accident where medical expenses or the seriousness of the injury do not breach the threshold will not qualify. Both the negligence rule and the tort restriction are policy levers that affect the answer to this question. If the accident qualifies, we must look at the victim's status. The source from which the victim attempts to recover compensation and the amount of effort he expends to do so both depend on the alternative sources to which he has access and how much he can recover from those sources. Economic theory suggests that the victim will pursue compensation from each source as long as the expected marginal benefit exceeds his expected marginal cost. This tradeoff will be explicitly affected by any setoff laws that prevent double compensation. In addition, the other policy

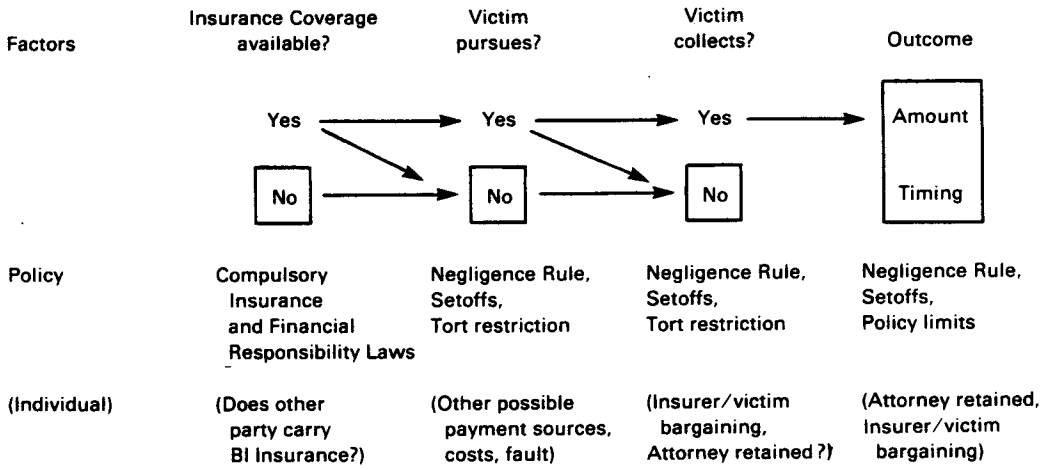

Fig. 1—Bodily injury insurance payments

levers that affect non-BI sources will determine whether the victim pursues BI because they affect how much he "needs" the BI insurance payment.

3. Does the victim collect anything and, if so, when and how much? Payments or lack thereof depend on the rules—there is some reduction for claimants' negligence under comparative negligence and there may be setoffs. However, rules may not be literally applied because settlements are frequently arrived at through risk-sharing of the two parties. There are several factors affecting the timing of payments, including the complexity of the claim, the need for investigation, negotiating style, and attorney involvement. We explore these lines of thought in detail below when describing our statistical modeling effort.

Sources of Compensation

We have walked through the process of determining a victim's compensation from one source, BI insurance. The processes governing other sources differ, but the reasoning follows similar patterns. We now enumerate the different sources and discuss how they interact.

Table 3 lists the several sources that might compensate an automobile accident victim for his injuries. The victim may be paid by a third-party BI insurer or, if the other party is uninsured, through his uninsured motorist insurance or by the other party. If he lives in a no-fault or add-on state, his own first-party PIP insurer may compensate him. Other possible sources of payment include health insurance, his employer, or workers' compensation. A victim may be compensated from one or more sources, or he may not be compensated at all.

Table 3 also lists the rules or policy levers that affect outcomes from each source. It does not list uncontrollable factors such as the circumstances of the accident (for example the sever-

Table 3

SOME FACTORS AFFECTING AUTOMOBILE ACCIDENT COMPENSATION FROM DIFFERENT SOURCES[a]

	Influences on Compensation	
Sources of Compensation	Probability of Payment	Amount and Timing
BI, uninsured motorist, and other party insurance	Negligence rule Compulsory purchase Tort thresholds Setoffs	Negligence rule Policy limits Setoffs
PIP insurance	Compulsory offer Compulsory purchase Setoffs	Policy limits Setoffs
Health insurance	Setoffs	Setoffs
Employer	Setoffs	Setoffs
Workers' Compensation	Setoffs	Setoffs

[a]Circumstances of accident and victims' characteristics (including possible retention of an attorney) affect all sources of compensation and are not specifically listed.

ity of the injury), the victims' characteristics (for example his degree of negligence), and how and whether the victim decides to pursue a particular source (e.g., whether the victim retains an attorney).

Among the compensation rules, whether third-party insurance pays will be affected by the negligence rule in the particular state, the presence of a compulsory insurance law, the stringency of the tort threshold, if any, and any applicable setoffs that prevent double compensation. Whether the victim is compensated by first-party insurance will be influenced by whether PIP is available in his state, whether its purchase is mandatory, and again by any applicable setoff laws.

Other characteristics of the victim and the accident will determine whether health insurance, workers' compensation, and his employer are potential compensation sources. The actual sources will depend on the effort with which the victim pursues these sources. Similarly, if an accident victim receives compensation, its amount and timing may be affected by policy limits and setoffs.

A typical accident victim may have the potential to be compensated for his losses from several sources. From which sources the victim attempts to recover compensation, how much effort he expends in attempting to recover, and how much money he receives from each source will be the outcome of a search process involving complex interdependencies.

DEALING WITH MANY VARIABLES

We used statistical models to adjust for state-to-state differences when making comparisons. The need for statistical models might best be made clear by explaining in greater depth the example alluded to in Sec. I. Suppose we are interested in comparing an accident victim's chances of collecting general damages (primarily payment for pain and suffering) from the other party's BI insurance in the states of North Carolina and New Jersey. We might simply compare the BI closed claims in the AIRAC sample and conclude that the chances of collecting general damages are about 70 percent in North Carolina and 96 percent in New Jersey. But as Table 4 shows, such a comparison would be misleading. Here we are comparing outcomes in states with different negligence rules (contributory in North Carolina and modified comparative in New Jersey) and with different tort thresholds (no threshold in North Carolina and $200 in New Jersey). Indeed, New Jersey's 1977 tort threshold of $200 screened out of many of the smaller potential BI claims. (Note the high economic loss of $1654.) Because claims with larger economic losses are more likely to obtain payment for general damages, comparing the unadjusted frequencies is rather like comparing apples to oranges.

The last row in Table 4 shows how a statistical model can adjust for the differences between the two states.[8] In particular, the odds of being paid for general damages depend not only on the state's rules, but also on the characteristics of the accident, the victim's injury, etc. Note the striking difference that this adjustment makes for North Carolina, moving 70 percent to 95 percent.

[8]A logistic regression model was fitted by maximum likelihood to the 0–1 variable denoting whether general damages were paid. The probabilities in the table reflect the two states' coefficients suitably transformed. Details are given in the notes to Table 4.

Table 4

COMPARING NORTH CAROLINA AND NEW JERSEY BI PAYMENTS IN AIRAC SAMPLE[a]

	North Carolina	New Jersey
Average economic loss	$ 637	$1654
Average payment	$1484	$4490
Average special damages payment	$ 570	$ 779
Average general damages payment (includes zero payment)	$ 914	$3711
→ Proportion receiving general damages payment	0.70	0.96
→ Adjusted probability of receiving general damages payment[b]	0.95	0.98

[a]Abstracted from Hammitt (1985), Table 4.6.
[b]Based on Hammitt (1985), Tables D.1 and D.2 for an accident with the following characteristics: $500 medical loss, 3 days of work lost, nonnegligent claimant, not disabled, represented by counsel, and 30 years of age.

The statistical models we used depended on the data set (PIP claims, BI claims, or consumer panel) and the outcome of interest (PIP payment, BI special damages payments, general damages, etc.). Vols. II and III describe the statistical methods in detail.[9]

We developed the actual models by a combination of conceptual reasoning and trying different possibilities with the data. For example, our reasoning behind modeling the amount of BI recoveries went as follows: Most claims settle; the settlements are presumably influenced by the parties' estimate of the award that would be returned if the claim went to trial, and consequently by the rules influencing such awards.

Specifically the model has three components: the entitlement, the bargaining process effect, and the policy limit ceiling.

- The *entitlement* is the payment the claimant is legally entitled to receive. It depends on the legal rules concerning liability and damages. One might naively predict the settlement would equal the entitlement. However, settlements may deviate from entitlements because of specific features of the bargaining process or because of the insurance policy limits.
- The *bargaining process effect* is the deviation between the entitlement and the settlement that results from the settlement being negotiated by the parties. This effect depends on the parties' negotiating strength—their bargaining positions and the individual negotiators' skills and abilities. It also depends critically on the extent to which the parties are uncertain about the outcome should the claim go to trial. When the uncertainty is small, settlements generally deviate little from the entitlement; when

[9]The statistical methods ranged from cross tabulations for PIP payments and BI special damages payments, to linear regression of time to and amount of payment, to logistic regression for payment of general damages and source of payment.

the uncertainty is great, the bargaining process effects could be as large as the entitlement.

- The *policy limit ceiling* exists because most BI insurance policies specify a maximum amount that the insurer is liable for in any one accident. The insurer will pay no more than the applicable limit even if the combined effect of the entitlement and the bargaining process effect would predict a payment higher than this limit. (The exception is that PIP policies in a few states have no overall limit.)

Therefore, we expect the following pattern of payment:

- No payments will exceed policy limits.
- Claimants whose entitlements, as modified by the bargaining process effect, exceed the limit are paid the limit.
- Factors that affect entitlements should also affect payments. In comparative negligence states, negligence rules reduce payments in proportion to negligence. Tort thresholds prevent some claimants from being paid.
- State rules affect actual settlement amounts less than entitlements because of the bargaining process. For example, some claims with an entitlement of zero are paid. Further payments will, in general, differ from the entitlement because of the nuisance value of some claims, risk avoidance by some claimants, and so on.

LIMITATIONS OF OUR STUDY

To estimate the effect of imposing a particular compensation rule, the classical experimental paradigm requires comparison of outcome measurements either in a state before and after the rule is changed or in two states that are identical except in this particular rule. As we have explained earlier, real world conditions and data availability make such comparisons impossible and thus force us to use statistical models.

In addition, fundamental limitations in the AIRAC closed claims data and consumer panel data prevent us from estimating the effects of rules on each step of the compensation process sketched in Table 2 and from estimating how particular rules affect the interaction of all the different victim compensation sources listed in Table 4.

The AIRAC closed claims data give comprehensive information about compensation to a large sample of victims who collected from BI and PIP insurance coverage. These data support statistical modeling of the payment and its timing from these two coverages. These data shed no light on compensation to victims who do not collect from BI or PIP. Also, even for victims in the sample, we have little information about payments they received from other sources—health insurance, employers, and the like.

The AIRAC consumer panel data remedy the multiple source deficiencies of the closed claims data, but at the price of a smaller sample and lower data quality. (Compensation information is self-reported by the victims, resulting in missing values and inconsistent responses.) The consumer panel sample of 1,849 victims is so thin that in our analysis of it we can distinguish compensation outcomes only by three broad groups of states: tort, add-on, and no-fault. The small sample size combined with the lower data quality led us to use the consumer panel data primarily to model sources of victim compensation rather than the amount of that compensation. In sum, then, this data set gives estimates of who pays for broad groups of rules rather than for particular rules.

Nonetheless, our statistical models have used these data sets to fill in important pieces of the automobile accident compensation puzzle. The difficult unfinished business requires collecting data to fill in the remaining pieces.

III. THE EFFECTS OF COMPENSATION RULES

Although various factors influence outcomes, this section primarily focuses on assessing how compensation rules affect:

- How likely it is that an accident victim is paid and who pays him
- How much the accident victim is paid
- How promptly the accident victim is paid.

Because our estimates adjusted for various factors as well as compensation rules, we were able to shed light on two further issues that interest many people concerned with automobile accident compensation:

- How much payments differ with retaining an attorney
- How much trial awards differ from settlement payments.

Readers interested in an in-depth analysis of these issues and a detailed description of our statistical methods should consult Hammitt (1985), and Houchens (1985).

HOW LIKELY IS AN ACCIDENT VICTIM TO BE PAID AND WHO PAYS HIM?

The Likelihood of Being Paid by Different Sources

To estimate how state rules affect the victim's likelihood of being paid by each of the several possible sources, we look separately at his compensation for *medical* loss and at his compensation for *wage* loss because they can come from different sources.

Table 5, based on the consumer panel survey, shows that the vast majority of *medical* payments come from group health and automobile insurance. However, victims who are compensated may be paid by several other sources either singly or in combination. Other sources

Table 5

PRIMARY MEDICAL COMPENSATION SOURCES BY STATE TYPE, PERCENT OF VICTIMS COLLECTING[a]

Source	Tort States	Add-on States	No-fault States	All States
Group health	32	34	33	32
Other auto	25	26	9	19
Own auto	22	34	39	30
Host auto	8	9	10	9
No payment	22	13	18	19

[a]Percentages do not sum to 100 because not all sources of payment are listed and because many victims collect from multiple sources.

not shown in Table 5 include other health insurance, workers' compensation, and military and other government programs. Less than 9 percent of victims are compensated by any of these other sources. As one might expect, more victims in tort states recover from the other person's automobile insurance than in no-fault states. (Note that "Own auto" in a tort state primarily refers to the medical coverage many policyholders elect on a BI policy but also includes Uninsured Motorist Insurance payments.)

By contrast, the patterns of sources of compensation for *wage* loss are diverse across the groups of tort states, add-on states, and no-fault states. Table 6 shows that about half again as many victims in tort states receive no payment for wage loss compared with no-fault states. The comparison between own auto and other auto for the two state groups is similar to that for medical loss. Employers compensate almost half the victims in no-fault states for wage losses compared with about one-third of the victims in tort states. This difference in employers' contribution is partly responsible for the difference we see in the proportion of victims who make no recovery for wage loss. Why this should occur is unclear; our best guess is that it reflects the fact that no-fault states tend to be more highly industrialized and that victims in no-fault states (and to a lesser degree, add-on states) have larger wage losses on average than do victims in tort states. Other sources of payment not shown in Table 6 paid less than 4 percent of victims for their wage losses. So in sum, we see sizable differences across types of states in payment for wage loss, but those differences, at least in part, seem to be due to employer practices and wage loss differences as well as to the difference in state rules.

Effect of Negligence on Frequency of BI Payment

In the no-fault states where we analyzed both BI and PIP closed claims, only a half to two-thirds of the PIP claimants would qualify for BI compensation even with no tort restriction (New Jersey, 69 percent; Massachusetts, 65 percent; Pennsylvania, 64 percent; and Michigan, 56 percent). This happens because BI is a liability coverage and compensates only

Table 6

PRIMARY WAGE LOSS COMPENSATION SOURCES BY STATE TYPE, PERCENT OF VICTIMS COLLECTING[a]

Source	Tort States	Add-on States	No-fault States	All States
Employers	32	35	46	38
Other auto	26	22	6	17
Own auto	6	19	36	19
Workers' compensation	7	3	5	6
No payment	37	32	24	31

[a]Percentages do not sum to 100 because not all sources of payment are listed and because many victims collect from multiple sources.

victims to whom another motorist is liable under tort law. For example, drivers of vehicles in single-car collisions are not eligible for BI compensation. For the remaining half to two-thirds of accident victims, specific negligence rules, degree of victim negligence, and tort restrictions affect whether the victim will be compensated by BI insurance.

How much more frequently do partially negligent victims collect BI insurance payments under comparative negligence rather than under contributory negligence? The widespread adoption of comparative negligence was motivated by the belief that partially negligent victims should get some compensation. Although contributory negligence theoretically restricts recovery to blame-free victims, some observers (Ross, 1970) report that the contributory and comparative negligence systems are indistinguishable in practice. Our analysis sheds some light on this issue, but data limitations preclude precise estimates of the effects of the various negligence rules on the fate of the partially negligent accident victim.

Generally speaking, analysis of the BI closed claims data indicates that negligent accident victims are more likely to be compensated under comparative negligence than under contributory negligence. Our estimate of the size of this difference depends in large part on assumptions about missing data on claimant negligence, the problems with which are that there is a higher frequency of missing data in contributory negligence states and the data may be missing in a nonrandom way. For example, claims adjusters may not record their assessment that a claimant is partially negligent in a contributory negligence state because it would "look bad" to pay that claimant. Also they may be less experienced at making estimates and may not generally include estimates in their files because they are not required to do so under contributory negligence. As Table 7 shows, for reasonable missing data assumptions, our analysis of BI closed claims data produced the surprising and unlikely finding that negligent claimants are more likely to recover from BI liability insurance in a modified comparative negligence state than in a pure. This result probably reflects differences among the percentages of negligent accident victims in particular states we analyzed. Perhaps some aspects of the no-fault systems that were present only in the modified comparative negligence states we studied contributed to these differences. The most we can legitimately conclude from these data is that adopting some form of comparative negligence will increase the number of victims who can recover from BI insurance by a modest amount, probably not more than 25 percent.

Table 7

AVERAGE PERCENTAGE OF PAID BI CLAIMANTS THAT ARE NEGLIGENT

Assumptions	States with Pure Comparative (10.7% of data missing)	States with Modified Comparative (9.3% of data missing)	States with Contributory (30.4% of data missing)
Data missing at random	18.2	31.5	14.2
All missing values correspond to negligent claimants	27.1	37.8	40.4

The Effectiveness of Tort Restrictions in Limiting BI Claimants

The motivation underlying tort restrictions is to substitute PIP insurance payments for BI insurance payments. How effectively do tort thresholds of varying degrees of severity work to eliminate third-party BI liability insurance claims? We find that the thresholds appear to work as intended in the states we studied. They exclude a large number of potential BI claimants, and we find no evidence of "padding" of claims.[1]

Table 8 gives estimates of the proportion of claimants that are eliminated by tort thresholds of different sizes. These estimates are based on the states listed and might vary for other states. The tort threshold of $200 in medical costs (net of hospital costs) that was in place in New Jersey at the time these data were collected eliminates an estimated 48 percent of the BI claims.[2] If the threshold is increased to $500 (including hospital costs), as in Massachusetts, about 12 percent more claimants will be eliminated. An increase to $750, as in Pennsylvania, trims another estimated 12 percent for a total of about seven-tenths of the claims. This range covers the three no-fault states with dollar tort thresholds that we studied in detail.[3] In addition, we studied Michigan, which has a verbal threshold that is defined by injury severity. Its verbal threshold eliminates an additional estimated 17 percent of the victims so that an estimated total of 89 percent of the BI insurance claimants are eliminated. The two other states with only verbal thresholds (Florida and New York) use similar definitions and hence should exclude a similarly large proportion of BI claims, although Florida's threshold is breached by a fracture and thus is probably less effective. We used several estimation methods based both on the PIP and the BI closed claims data and the results are similar. Table 8 gives estimates based on the PIP claims data.

Table 8

ESTIMATED EFFECT OF TORT THRESHOLD ON BI FILINGS

Threshold	Percent Excluded[a]
$200 (New Jersey)	48
$500 (Massachusetts)	60
$750 (Pennsylvania)	72
Verbal only (Michigan)	89

[a]Calculated from the PIP files from the four states listed by taking the proportion of PIP claims that would have qualified for BI compensation before the imposition of the threshold but that no longer qualify. Alternative estimates using different methods are also given in Hammitt (1985), Sec. VI.

[1]In some no-fault states, there have been allegations that claimants exaggerate their medical expenses in order to breach the thresholds (U.S. Department of Transportation (1977), p. 77). Also see O'Connell (1977), pp. 159–160; and Widiss et al. (1977), for allegations about New York and Florida, states for which we did not analyze closed claims data.

[2]New Jersey now has an optionally stricter tort threshold as well as the $200 threshold in effect in 1977.

[3]Note that any comparisons with the present for dollar tort thresholds would need to account for the intervening inflation.

New Jersey's tort threshold is the least effective, and the verbal threshold in Michigan is the most effective, eliminating nine-tenths of all BI insurance claims. In all cases, our estimates suggest tort thresholds have a large effect in limiting the number of accident victims who are able to collect from BI insurance. However, the more serious claims are not excluded by tort thresholds; hence the effect on total payments is much less.

HOW MUCH IS THE ACCIDENT VICTIM PAID?

To understand the factors that determine how much money the accident victim is paid, we compare the payments he receives with his economic losses and comment on how the negligence rules might affect the amount of money he receives. We look at BI payments for special and for general damages, at PIP payments, and at total payments from all sources.

BI Payments for Special and for General Damages

Third-party BI liability payments can conveniently be divided into special damages (payment for economic loss) and general damages (payment for other losses, including pain and suffering).

In traditional tort states, such as California (shown in Table 9), about 90 percent of those victims who get paid under BI insurance receive full compensation for their economic loss (special damages). The remaining 10 percent get less than full payment for several reasons. Reduction in payment in proportion to claimant's negligence is a significant factor (28 percent of these cases). Other reasons include economic losses exceeding the policy limit, collateral source setoffs, contribution by other defendants, and the insurer's refusal to pay for medical treatment considered to be unreasonable.

By contrast, in the no-fault state of New Jersey, more than half of the claimants (61 percent) receive less than their economic loss, with many (51 percent) receiving no payment for special damages at all. This occurs because BI claimants in New Jersey generally are paid for their economic losses under their PIP policies and then file BI claims to get paid for general damages. Patterns differ among no-fault states.

Payment for general damages (mainly pain and suffering) is difficult to analyze because it is difficult to define what *general damages* mean. One cannot say whether a claimant is overcompensated or undercompensated for his pain and suffering, because there is no objective measure. The usual index for the adequacy of payments for general damages is the ratio of the payment for pain and suffering to the actual economic loss (or sometimes to medical loss).

Table 9

BI INSURANCE PAYMENT FOR SPECIAL DAMAGES IN TWO STATES, PERCENT OF TOTAL PAYMENTS

Special Damages Payment	California (tort)	New Jersey (no-fault)
Less than economic loss (including no payment)	10	61
No payment	4	51

Empirically, this ratio varies with the size of the economic loss as well as with other factors. The conventional wisdom (Ross, 1970) is that claims adjusters use rules of thumb based on this ratio in negotiating payment for general damages.[4] Claims adjusters multiply medical costs or payment for special damages (economic loss) by a fixed factor, such as 6 or 3, to assess the appropriate payment for general damages.

The analytic problem is that even if such multiples are widely used, this fact may not be apparent in our BI insurance claims data. First, different companies may use different multiples, and the AIRAC data come from several insurers. Second, our statistical models may not adjust perfectly for how a claims-handler reduces his settlement target when the claimant is partially liable—our models use different adjustment factors for the different negligence rules. Finally, the extent that the claims-handler does better or worse than predicted on a particular claim will tend to obscure any clear relationship.

Figure 2 shows the relationship between medical loss and BI insurer payment for generals in all six states we studied. These data show a varying median ratio between payments for

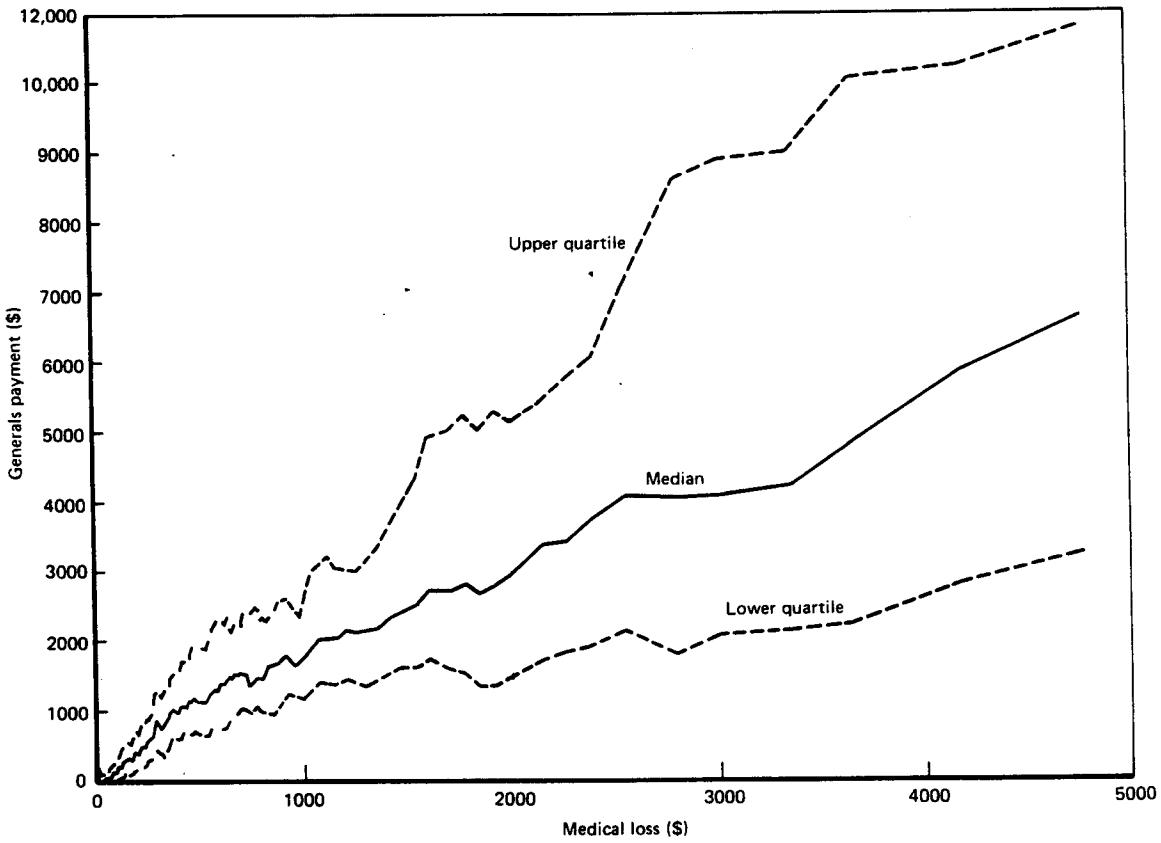

Fig. 2—Distribution of payments for general damages by medical loss

[4]More recently, Hamilton, Rabinowitz, and Szanton, Inc. (personal communication) report that such multiples are in wide use in the claims departments of several major automobile insurers.

general damages and medical loss with wide variation around the median. It plots the median and upper and lower quartiles of the distribution of payments including zero payments for general damages. Even after controlling for medical expenses, the amount paid varies substantially, particularly for larger medical losses.

The size of payment as well as the probability of payment for general damages is smaller for negligent claimants under all three negligence rules. For those claimants who are paid for general damages, payments are reduced about in proportion to degree of negligence under either form of comparative negligence, but do not fall as much under contributory negligence. However, data limitations make this conclusion a tentative one. Other factors that affect size of payment for general damages include type and severity of injury, age of claimant, whether an attorney is retained, and the like.

One thing is clear from this analysis: The victim cannot expect to be automatically paid several times his medical expenses to compensate for his pain and suffering. We saw earlier that in traditional tort states, BI insurance fully compensates most victims who make successful BI claims for their economic loss. By contrast, the probability and size of payments for general damages (pain and suffering) is quite variable.

PIP Payments

The major aim of first-party or no-fault insurance is to pay automobile accident victims promptly for their economic loss without regard to fault. The idea is that the "price" of the more universal coverage of PIP insurance is the elimination of payments for general damages. PIP fully compensates most victims for their economic loss.

Despite fundamental differences across states in the benefits provided by PIP insurance and in the restrictions on the right to sue, the size of PIP payments is similar across the states. Over three-quarters of PIP claims payments in every state are exactly equal to the victim's economic loss. Three reasons explain why most of the remaining claimants are paid less than their economic loss: policy limit ceilings, policy limits on wage loss payments, and setoffs of collateral sources of payment. About 5 percent of PIP claimants in states with low benefit limits (Massachusetts and Maryland) suffered economic losses greater than their policy limits. In addition, after policy limits, specific restrictions on the size of wage loss payments is the most common reason for smaller payment in three of the five states. Collateral source offsets are important factors in three states.

Total Payments from All Sources

Figure 3 shows that conditional on something being paid, when total compensation is compared with economic loss, victims with small losses get paid more on average than their economic loss while victims with large losses are paid less on average than their economic loss.[5] Small losses (up to $300) in tort and add-on states get paid on average over a third more than their economic loss. Moreover, there is greater variation in the ratio of average payment to economic loss in tort and add-on states than in no-fault states. (Note the broader vertical range in the curves for these states in Fig. 3.) This greater variation occurs for two reasons: the presence of highly variable payments for general damages under the tort system and the leveling effect caused by broader coverages of PIP in no-fault states.

[5]Figure 3 shows the estimated payment ratio for each state group assuming a moderate or severe injury in a multi-car accident where the driver of the victim's car was not issued a ticket and no lawyer was retained.

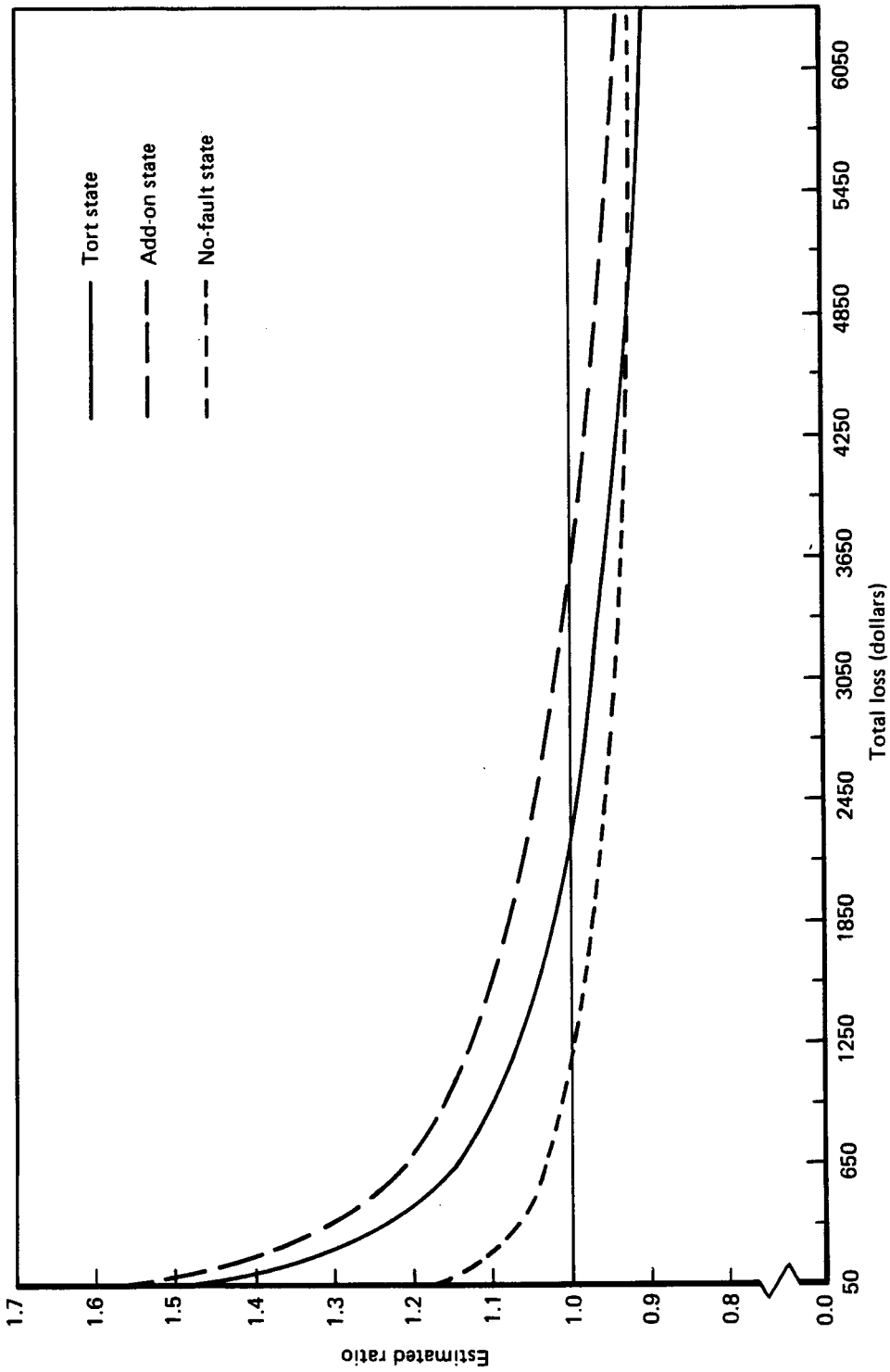

Fig. 3—Estimated payment ratio for moderate and serious injuries

HOW PROMPTLY IS THE ACCIDENT VICTIM PAID?

No-fault PIP insurance was expected to speed up payments to victims compared with BI insurance. How well has it worked in achieving this goal?

In addressing this question, we need to remember that the two policies differ in the way they make payments to claimants. BI claims typically are settled with a lump sum payment in exchange for which the claimant releases the insurer and its policyholder from further liability. In contrast, PIP policies work like health insurance; claimants typically get several payments. Payments are usually made promptly after the claimant submits documentation of his expenses. Another important difference is that BI claimants frequently retain attorneys but PIP claimants usually do not. Only 10 percent of PIP claimants employ lawyers to assist with their PIP claims (others retain attorneys for a parallel BI claim), whereas half of BI claimants employ lawyers.

Figure 4 reflects these differences in the average time to final BI and PIP payment, controlling for the claimant's economic loss and whether an attorney was retained or suit filed.[6] Controlling for economic loss, the great majority of PIP claims (those with no attorney) take almost as much time to final payment as the corresponding half of the BI claims (those with no attorney). However, over half of the PIP claimants receive some payments before their final payments; and three-quarters receive at least one payment within 60 days of their accidents.

Attorney presence is associated with much longer times to settlement not only for BI claims but also for PIP claims. The presence of an attorney is probably in part a proxy for the complexity of the case. An attorney may be retained if the claimant feels that the insurer is delaying payment or refusing to compromise. Hence, the increased length of time to payment probably reflects not only the effect of the attorney's involvement but also the complexity of the claim. Because only one-tenth of PIP claimants retain attorneys for their PIP claims compared with one-half for BI claimants, the average time to final payment is considerably shorter for PIP claimants than for BI claimants.

HOW MUCH DO PAYMENTS DIFFER WITH RETAINING AN ATTORNEY?

Because negligence need not be determined for first-party insurance payment and there is no issue of payment for general damages, attorneys are rarely retained. However, attorneys frequently handle BI claims.

Whether a BI claimant retains an attorney is strongly associated with the size of his recovery. An attorney's presence is associated (1) with substantially higher *gross* recoveries (depending on the state and the circumstances of the accident), and (2) with the same or only slightly higher *net* recovery by the claimant.

Table 10 presents an example of an accident in California with an economic loss of $507 ($277 in medical costs and $230 in wage loss). This loss is about the median payment for special damages for a successful BI automobile insurance claim. For an accident of this size, the claimant who does not retain counsel has an estimated 83 percent chance of receiving payment for general damages, and if he does, his payment averages $1,603. About 95 percent of such

[6]Whether an accident victim's decisions to retain an attorney and go to trial affect the amount of money he receives is beyond the scope of our research. Such questions deal directly with decisions made by litigants rather than by states. However, they are of considerable interest to workers in the automobile accident compensation arena. Because our statistical models controlled for various factors affecting payment, our research yields some insights on how attorneys and trials may affect payments.

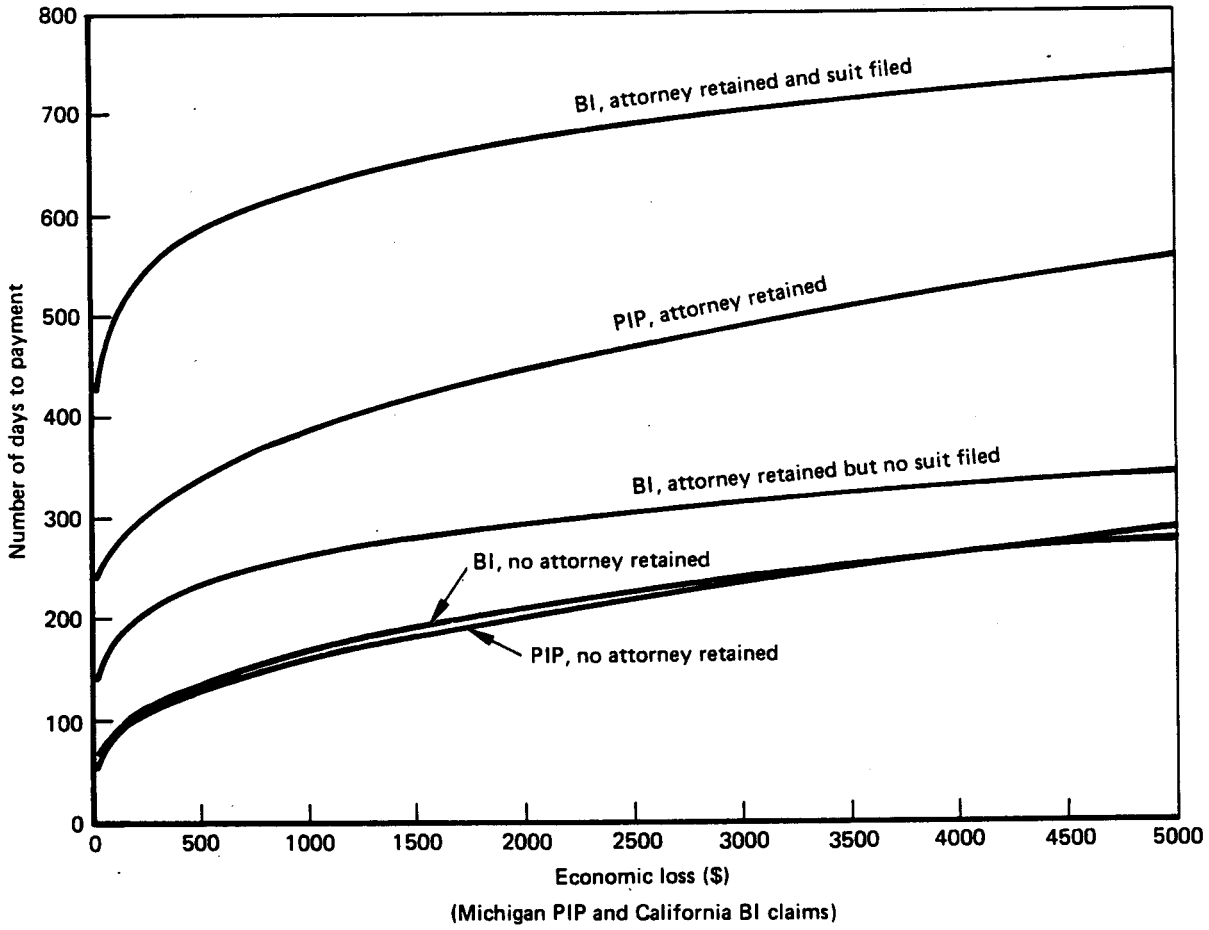

Fig. 4—Predicted time to last PIP and BI payments

Table 10

TYPICAL BODILY INJURY INSURANCE PAYMENTS

	Without Lawyer	With Lawyer
General damages		
Probability	.83	.95
Size	$1,603	$3,251
Special damages	$507	$507
Expected legal fees	$0	$1,198
Expected net recovery	$1,844	$2,396

victims who do retain lawyers receive payment for general damages, and these payments average $3,251 in these circumstances. With or without an attorney the victim would usually receive full payment, $507, for his economic loss. If we assume that the lawyer collects a contingency fee of about one-third of the claimant's recovery, the expected net recovery is in the same ballpark for both parties—$1,844 vs. $2,396.[7]

There are several features in the patterns of recoveries with and without attorneys that are not captured in this example. Although the median claimant in every state we studied had a higher expected net recovery with an attorney than without, the expected net recovery comparison varies substantially across claimants in differing circumstances.

One is tempted to infer from this calculation that lawyers "pay their way," but in fact these numbers reflect both the productivity of the lawyer in negotiating a settlement *and* a "selection effect." By that we mean that the contingent fee arrangement encourages an attorney to select claims that will justify his investment of time in pursuing them. Our statistical models allow us to control for some characteristics of accidents and victims that affect recovery potential. However, because we have only limited information on each claim[8] there is still a possibility, indeed a probability, of substantial selection effects. Thus we will not try to infer cause and effect about how having an attorney influences the size of payment.

We have also had to ignore another important aspect of attorneys' work. Our data include only claimants who obtained payment from BI insurance. Lawyers probably also improve a claimant's chance of being paid at all by BI insurance.

HOW MUCH DO TRIAL AWARDS DIFFER FROM SETTLEMENT PAYMENTS?

BI claims are usually settled out of court, but some are resolved at trial. Claims are settled for an amount based on the parties' expectations of the outcome if they were to go to trial. Neither party should settle for an amount that is worse than he expects the trial outcome to be minus his costs of going to trial. In general, the cases that go to trial are the ones in which the two parties can least accurately predict the trial outcome.[9] Settlements are compromises among possible awards. Hence, we might expect that the average recovery at trial would be about the same as for similar settled cases, but that trial awards would have greater variation than settlement awards.[10]

We separately analyzed cases that were settled during trial, those settled without trial, and those tried to verdict. Average payments for both special and general damages were roughly equal for the three groups. As expected, the variance of payments was highest for tried cases followed by cases settled at trial and finally by cases settled before trial. In one sense

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[7]The estimates in Table 10 are calculated for a claimant with the median medical loss and age for California, and with all categorical variables in our regression models, such as whether the claimant was disabled, equal to their statewide means. Because of rounding, calculating the expected net recovery from the numbers in the table will differ from the listed number in the third significant figure.

[8]Other variables controlled for in our regression equations include state, medical costs, work loss, reported claimant negligence, seriousness of injury, and accident location.

[9]If both parties could accurately predict the outcome, they should settle for that amount and save the costs of trying the case.

[10]Strictly speaking, this should be true when we average over all trial verdicts. Because our data do not include defense verdicts where the plaintiff recovers nothing, we might expect trial awards in our data to be somewhat higher on average.

this average equal payment finding confirmed our theory, but it flies in the face of the view of many claims adjusters that the expected "verdict value" of a case is several times its expected "settlement value."[11]

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[11]Hamilton, Rabinowitz, and Szanton, Inc. (personal communication).

IV. CONCLUSION

PREDICTING EFFECTS OF PROPOSED POLICY CHANGES

To illustrate the applicability of our statistical analyses, we estimate the consequences of three possible changes in Maryland's rules governing automobile accident compensation. Any other state could be analyzed with equal ease using the same method. Although improvements in these estimates will come with better and more appropriate data, the models used in this study provide a major step forward in our ability to study the effects of specific proposed changes.

We chose Maryland as the example because its status as an add-on state that has the contributory negligence rule suggests several possible "reforms" for analysis.[1] First, a comparative negligence rule could be adopted either in a pure or modified form. Second, the current $2,500 benefit limit on PIP insurance could be substantially increased. And finally, because no bar to tort suits now exists, either a dollar or verbal tort threshold could be instituted. Any or all of these changes might reasonably be proposed.

We present our best estimates of how each of these changes would affect the automobile accident victim in Maryland. Even though data limitations force us to make several assumptions, we believe our estimates are improvements over those now available. For the calculations given below, we use data specific to Maryland rather than to a "generic" add-on or contributory negligence state. These data values are used with the analytic methods presented in Vol. II to generate the estimates predicted here.[2] These methods can be used with values for any other state.

Adopting Comparative Negligence

If Maryland changed from contributory negligence to some form of comparative negligence, we might expect two possible effects. First, partly negligent victims who were barred from recovery under the "all or nothing" contributory negligence doctrine should now be able to collect from the other party (and his BI insurer). Second, those partly negligent victims now being paid by BI insurers (under contributory negligence) will receive somewhat smaller payments on average.

Here are our best estimates of the effects of a change from contributory to comparative negligence in Maryland:

- We estimate that claimants paid under BI insurance will increase by 6 percent.
- We estimate that partly negligent claimants who now collect under contributory negligence will average 20 percent smaller payment under comparative negligence.

A change to comparative negligence can be expected to have only a modest effect on the number and size of payments for BI claimants.

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[1]We have no information, however, that any changes are currently being actively considered in Maryland, nor do we recommend any.

[2]Hammitt (1985).

Increasing the Benefit Limit on PIP Insurance

If Maryland's PIP benefit limit of $2,500 were abolished, how many PIP claimants would be affected and how much more would they be paid? Introducing unlimited benefits to PIP would affect only PIP claimants whose economic loss exceeded $2,500. It should not appreciably change the total number of PIP claimants. We assume that increasing the PIP limit would mean that the 5 percent of PIP claimants who are now undercompensated relative to their economic loss because of the $2,500 limit would now get full payment. Although only 5 percent of the PIP claimants are affected, they are the ones with the largest losses. Consequently, PIP premiums would probably increase by a large amount. Our data suggest that the increase in the total dollars being paid to PIP claimants in Maryland would be only 15 percent. Other data suggest a much larger increase, however.[3]

Instituting a Tort Threshold

If Maryland moved from being an "add-on state" to being a "no-fault state" by instituting a tort threshold, how effective would thresholds of varying severity be in reducing the number of BI claimants? We saw in Sec. III that as dollar tort thresholds increase, more and more BI claimants are eliminated. In addition, most BI insurance payments are settlements rather than trial awards, so claimants with medical losses below a given tort threshold sometimes get payment because of the nuisance value of the claim, uncertainty about whether the medical costs will exceed the tort threshold, and other ambiguities in the negotiating process. A threshold will probably therefore eliminate some BI claims and reduce others through the "risk sharing" that occurs in settlements. Our analysis yields the following estimates of the effects of various tort thresholds:

- The estimated proportion of BI claimants eliminated by varying sized thresholds is

Threshold	Percent Reduction
$200	42
$500	68
$750	78
Verbal	90

- The few remaining claimants below the threshold who collect from a BI insurer will get an average of 30 percent less in general damages than they would with no threshold.[4]

The claims not eliminated by the threshold are more serious and more costly than average. Hence, total payments will not be affected as greatly.

[3]The 15 percent is based on 1977 data. Inflation should continually increase this percentage. Also, one company that has increased medical benefits from $2,500 to unlimited has experienced a threefold increase in costs (private communications). This company states that one reason for the divergence is that closed claims do *not* include many of the very large PIP claims. That is, many very large PIP claims do not close until the claimant dies—more than 30 years in some cases. Also, a claim is closed when the policy limit is reached, and this action may result in a smaller economic loss being recorded because the insurer stops counting when its involvement ends. Also, if an injured party cannot pay hospital bills over the amount covered by his policy, he may leave the hospital simply because he cannot afford to stay longer.

[4]See the regression equation given in Hammitt (1985), Appendix D.

SUMMARY OF FINDINGS

Our results are a mixture of empirical confirmation of the conventional wisdom and some mild surprises. We found substantial differences between how automobile insurance compensates victims in states with no-fault systems and those without. These differences range from the likelihood and source of payment to the amount and its timing.

An estimated 13 percent of automobile accident victims in no-fault states are not paid by any source, compared with an estimated 9 percent in add-on states and 20 percent in tort states. Victims in no-fault and add-on states have a better chance than tort state victims of receiving some compensation, primarily because of their assured compensation from first-party insurance that is not present in tort states. Add-on states have the fewest uncompensated victims, because both BI and PIP insurance coverages are available to them and they have no tort thresholds. (But add-on states as a group include both mandatory and optional PIP purchase rules; we do not know how many drivers purchase PIP in optional states.) It also turns out that victims in no-fault states have a better chance of collecting for wage losses from their employers than in other states.

For a given size economic loss, the amount of total payment from all sources to the victim varies much more in tort states than in no-fault states. This unpredictability in tort states is due largely to the presence of variable payments for general damages (pain and suffering) under BI insurance policies. It turns out to be impossible from our closed claims data to make precise predictions of whether a given victim will be paid general damages and, if so, how much. This empirical finding casts doubt on the image of claims adjusters using rigid rules of thumb to arrive at settlements. To the extent that rules of thumb such as "general damages are three times special damages" are used as guides, the negotiation process and other aspects of particular cases must substantially affect the final settlement to generate the data patterns we see.

A victim's economic loss (special damages) is usually fully paid by his automobile insurer (when some payment is made). About 90 percent of PIP insurance claimants get paid fully for their economic loss. In the case of BI insurance, also about 90 percent of the claimants in tort states receive special damages payment equal to their economic loss. If some payment is made to a victim by an automobile insurer, therefore, it will usually cover the victim's economic loss.

For claims to automobile insurers where an attorney is not retained, undue delay in payment is usually not a problem. PIP claims usually are settled within three months unless the claim is very large. BI insurance claims have similar timing to PIP when the claimant does not retain counsel. However, BI claims where an attorney is retained tend to take much longer to settle, particularly when a suit is filed. This occurs for two reasons: (1) attorneys represent claimants in the more complex cases that would take longer in any event, and (2) the attorneys' actions may increase the time to settlement. Our data do not allow us to separate the effects of these two causes.

Somewhat surprisingly, we found that the tort restrictions in no-fault states appear to reduce the number of BI insurance claims substantially. For example, New Jersey's low $200 (net of hospital expenses) tort threshold appeared to eliminate about half of the BI insurance claims that might otherwise have been filed. More severe dollar thresholds were associated with even greater reductions, and verbal tort thresholds seem to eliminate most (90 percent) of BI insurance claims. Because tort thresholds do not eliminate the more costly cases, the dollar reduction in claims is much less than the above numbers suggest. Our data showed no evidence of "padding" claims to exceed the threshold.

In sum then, our findings about the operation of the no-fault systems of automobile accident compensation in various states are modestly favorable. The professed goals of the no-fault concept are (1) elimination of tort liability, (2) substitution of an alternative compensation mechanism, and (3) universal application of the alternative mechanism.[5] Although it is well recognized that none of the enacted no-fault systems fully aspire to these goals, the systems in the states we studied partially achieve all of them. Tort thresholds appear to effectively eliminate 50 to 90 percent of BI claims in the states we studied; the varying stringencies of thresholds affect the precise percentages. No-fault insurance appears to work as designed in paying for victims' economic losses with 90 percent of PIP insurance claimants being paid fully for their economic losses. Our study did not explicitly assess the extent of PIP coverage, but we did see that add-on and no-fault states had roughly half as many uncompensated auto accident victims as tort states did. Whether this partial achievement of no-fault goals vindicates the decision to adopt the present no-fault systems is widely debated and disagreed about. We hope that our empirical results will help to further inform this debate.

On the liability rule side, we found that changing from contributory negligence to some form of comparative negligence appeared to have only a modest effect on who was compensated and the amount received. The size of the estimated differences associated with the different negligence rules varies with the state, but in most cases the total payout by BI insurers should not increase by more than 10 percent as a result of instituting some form of comparative negligence. Instituting comparative negligence appears to have at most a modest effect at only a modest cost in potentially increased BI insurance premiums.

Finally, our statistical methods are tools that can identify the effects of policy changes. Specific proposed changes in particular states can be analyzed with these tools so that decisionmakers can have a better assessment of the effects of the options they are considering.

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[5]Keeton and O'Connell (1965).

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