

INVITED ARTICLE

No-Fault Approaches to Compensating Auto Accident Victims

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ABSTRACT

This study estimates the effects of a broad range of alternative no-fault auto insurance plans, compared with the traditional tort system. A simulation model relating accident victims' injuries and losses to their expected auto insurance compensation under a specified no-fault plan is applied to a representative sample of auto accident victims in the tort states. Their estimated compensation under each of several no-fault alternatives is then compared to their actual compensation. The results indicate that no-fault can yield substantial savings over the traditional system, or may increase costs substantially, depending on the no-fault plan's provisions. Regardless of plan provisions, all no-fault plans reduce transaction costs, match compensation more closely with economic loss, reduce the amounts paid in compensation for noneconomic loss to less seriously injured people, and speed up compensation.

Introduction

Proposition 103 in California, the revamping of the auto insurance systems in Pennsylvania and New Jersey, and legislative debates about auto insurance in many other states testify to the widespread dissatisfaction with current auto insurance systems. In particular, the perceived limitations of traditional approaches to compensating people injured in auto accidents have revived interest in no-fault approaches to compensation. In many states, the likely consequences of adopting some form of no-fault compensation system have become the subject of heated debate.

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The traditional approach to compensation is based on fundamental common-law principles. Its critics rarely dispute these principles on their merits. However, they argue that the traditional approach is overly expensive, inefficient, and slow; that the compensation it provides is too often inadequate; and that, in any event, the compensation is inequitably distributed among claimants. Weighing these arguments requires consideration of whether the outcomes resulting from no-fault would actually differ from those resulting from the traditional approach and, if so, how, and by how much.

We used data on the compensation provided to people injured in auto accidents in the late 1980s to develop a simulation model that estimates the effects of adopting a specific no-fault alternative in a specific state. We then used the model to estimate the effects of shifting from the traditional compensation system to one or another of 21 alternative no-fault plans in each of the states that presently relies on the traditional system. Additional details underlying the analysis presented in this article are available in Carroll et al. (1991).

Background: Traditional vs. No-Fault Systems

Under traditional compensation systems, accident victims are entitled to compensation from others involved in the accident for both economic losses (medical costs, lost wages, and other monetary costs) and noneconomic losses (pain and suffering and other nonmonetary costs). However, the others involved in the accident are liable to the injured party only to the degree that they were responsible for his or her injuries. An insured driver's bodily injury (BI) insurance pays the compensation he or she owes the injured person, up to the policy's limits. Drivers can purchase uninsured motorist (UM) insurance to cover themselves for any compensation they cannot obtain from an uninsured motorist, up to the policy's limits.¹

Drivers may also purchase medical payment (MedPay) insurance to cover their own medical expenses (and funeral costs), regardless of who is at fault, typically to relatively low policy limits (\$1,000 to \$5,000). MedPay does not cover other economic losses, such as lost earnings, or noneconomic losses. We refer to the states that rely on the traditional, liability-based approach to compensation as "tort states."²

The no-fault approach to compensation shifts the emphasis from liability-based compensation toward compensation provided without regard for fault. A no-fault plan specifies a threshold that bars liability claims unless injuries or losses are sufficiently serious to exceed the threshold. A verbal threshold

¹ Compensation under UM insurance is governed by the rules that determine BI compensation: All types of losses are covered, but only to the extent the injurer is responsible for the injury. In essence, the injured's UM assumes the obligation that would have fallen to the injurer's BI insurance if the injurer had purchased BI coverage.

² In the mid- to late-1980s, when our data were collected, 26 states relied on the liability-based approach to compensation.

specifies the injuries that entitle an accident victim to pursue a liability claim (e.g., "dismemberment" or "significant and permanent loss of an important bodily function"). A dollar threshold establishes a dollar amount that medical costs must exceed before the victim can pursue a liability claim.³

In return for the barrier to liability claims, no-fault plans establish an enhanced form of first-party no-fault insurance, personal injury protection (PIP), which covers all types of economic losses to policy limits well above those typical of MedPay policies.⁴ Minimum PIP policy limits vary across states, generally ranging from \$5,000 to \$50,000. New Jersey has a \$250,000 PIP policy limit,⁵ and Michigan provides unlimited coverage of medical losses.

Previous Research on the Effects of No-Fault

There have been numerous analyses of the effects of the no-fault plans adopted to date (Witt and Urrutia, 1984; U.S. Department of Transportation, 1985; Smith, 1989; and Cummins and Weiss, 1991). Although the specifics differ, the previous studies have generally found that plans having relatively restrictive tort thresholds result in cost savings, while plans with relatively low thresholds result in increased costs. These studies generally conclude that these results reflect the tradeoff between the savings obtained by diverting claims from the liability system⁶ and the increased costs of providing full compensation, up to the PIP policy limit, for economic losses to all claimants.⁷ In no-fault plans with relatively high thresholds, the fraction of tort claims eliminated tends to be large enough to outweigh the increased costs of PIP coverage. Because no-fault plans with relatively low thresholds divert relatively few claims, the savings on diverted claims generally fall short of the increased PIP costs.

Most previous studies employ some form of time-series, cross-sectional analysis of an aggregate measure of insurance costs, such as the pure premium

³ When our data were collected, Florida, Michigan, and New York had verbal thresholds; Colorado, Connecticut, Georgia, Hawaii, Kansas, Massachusetts, Minnesota, New Jersey, North Dakota, and Utah had dollar thresholds; and Kentucky offered a choice between a dollar threshold or the traditional system. Since then, Georgia has repealed its no-fault plan, and New Jersey and Pennsylvania have adopted plans offering a choice between a verbal threshold and the traditional system. All dollar thresholds have included a "verbal component" which specifies the injuries that entitle an accident victim to pursue a liability claim even if their medical costs do not exceed the dollar threshold.

⁴ During our analysis period, PIP coverage was also available in 11 states that had not adopted tort thresholds. Because there was no barrier to liability claims in these "add-on" states, they are not considered in this analysis.

⁵ New Jersey provided unlimited coverage of medical losses when our data were collected.

⁶ Compensation for noneconomic loss is eliminated on diverted claims. And, because disputes over relative fault and over the extent of noneconomic loss do not arise on diverted claims, the transactions costs incurred in resolving them are reduced.

⁷ Under the traditional system, claimants receive less than full compensation for their economic losses to the extent that they were responsible for the accident or if they were injured by an uninsured motorist and lacked UM coverage.

or the mean loss ratio, at the state level.⁸ Such studies have three major limitations: These aggregate measures are affected by factors other than the kind of compensation system a state has adopted.⁹ In particular, the decision to adopt a no-fault plan may reflect factors that underlie a state's automobile insurance experience (Johnson, Flanigan, and Winkler, 1992). But the available data may not be sufficient to control for interstate variations in factors other than those related to the driving environment such as traffic density and average miles driven per car.

Second, analyses using aggregate data at the state level do not identify the effects of no-fault on individuals. Consequently, they do not address the effects of no-fault plans on many of the issues that have arisen in the policy debate: transactions costs relative to compensation, the net compensation provided to injured people, the relationship between an injured person's losses and his or her compensation, the distribution of compensation across victims, or the time to compensation.¹⁰

Finally, the previous research examined the effects of general types of no-fault plans (e.g., those having a verbal threshold) on costs in the states in which those types of plans were adopted. Although such research can suggest the ways in which different types of plans generally affect costs, it does not directly address the effects of design differences on relevant outcomes; nor does it illuminate the possibility that any particular plan will have different effects in different states. The same no-fault plan, depending on where it is introduced, may have very different effects.

Research Approach

This study uses data on the compensation experiences of a nationally representative sample of individual accident victims to estimate the effects of implementing alternative no-fault plans in the tort states. Data on individuals injured in auto accidents in the no-fault states are used to model compensation outcomes—the probabilities of receiving compensation and amounts received from various coverages—as functions of characteristics of the victim and the

⁸ The pure premium for an injury coverage is the average amount paid in a year on that coverage per insured. The mean loss ratio is the proportion of the premium dollar paid out.

⁹ For example, the compensation for noneconomic loss provided a given claim, for given injuries and losses, might vary across states, depending on such factors as the relative quality and aggressiveness of the plaintiffs' and defense bars, claims adjusters' accepted valuations, perceptions of judges' and jurors' attitudes, and so on. Regardless of the reasons why claims are worth more, or less, on average, in different jurisdictions, the effects of a no-fault plan on a given claim will vary with its "worth."

¹⁰ Rolph et. al. (1985) analyzed the compensation provided to individuals for auto accident injuries in 1977. However, because their data were collected soon after most of the no-fault plans had been adopted (All-Industry Research Advisory Council, 1979), that study describes the initial, but not the long-term, effects of no-fault approaches to compensating auto accident victims. And, because it did not combine data across coverages to reflect the possibility that an individual was compensated under more than one auto insurance policy, their results do not address the question of how no-fault affects the total compensation provided to an injured person.

no-fault plan. The possible outcomes are that the victim receives no compensation, only PIP compensation, only BI/UM, or both PIP and BI/UM. We then specify a no-fault plan and use the models to simulate the compensation outcomes of tort state accident victims under that plan. The tort state victims' actual outcomes under the traditional system are compared to their simulated outcomes under the specified no-fault plan to assess the plan's effects. We repeat the process for 21 alternative no-fault plans selected to represent a broad range of possible no-fault plans.

Constructing a Data Base

The study is based primarily on data from two sources: closed claim surveys and a household survey, both conducted by the Insurance Research Council (IRC), formerly the All-Industry Research Advisory Council (AIRAC). AIRAC (1989) obtained detailed information on a national sample of auto-accident injury claims closed during 1987 under the principal auto injury coverages—BI, MedPay, UM, underinsured motorist (UIM), and PIP. The data were collected by 34 insurers that together accounted for about 60 percent of private-passenger automobile insurance by premium volume at the time the data were collected. Claims closed without payment were not included.

We weighted the observations in each closed-claim file by the inverse of the participating insurers' share of the private-passenger auto insurance market, by state. Assuming that the distribution of claims is proportional to the distribution of policies written and that the participating insurers are representative of auto insurers generally, the weighted sample for each state is representative of the aggregate distribution of paid auto insurance claims in that state.

The closed-claim files were then merged, adjusting for the probability that a claimant who received compensation under one auto insurance policy would have also received compensation from a collateral claim for the same injuries/losses against another auto insurance policy.¹¹ Specifically, we estimated state-specific discriminant and logistic models of the probability that a first-party (MedPay or PIP) claimant would have also received third-party compensation (BI or UM) and corresponding state-specific discriminant and logistic models of the probability that a third-party claimant would have also received first-party compensation.¹² We estimated the models using data from the paid claims for which we also knew whether or not the claimant had received compensation on the basis of another auto insurance claim. We tested such variables as medical loss, work loss, the type and seriousness of injury and disability, whether an attorney was hired, economic loss, and whether the threshold was exceeded (in a no-fault state). Several alternative variables were tested for the claimant's negligence and the type of state law concerning negligence and compensation. Also considered were the claimant's age, sex, marital status, and driving record. Table 1 provides an example of one state's discriminant and logistic models. The models can be used to estimate the

¹¹ For example, the probability that someone compensated under another driver's BI coverage would also be compensated under his own MedPay coverage.

¹² The models are presented in Carroll et al. (1991), Appendix C.

conditional probability that a claimant who received MedPay compensation would also receive BI or UM compensation, for all tort state claimants combined.

Table 1
Probability of Receiving BI or UM Compensation
for Claimants Who Received Medpay Compensation:
All Tort States

Claimant Characteristic ^a	Discriminant Function		Logistic Regression		Variable	
	Estimated Coefficient	t Statistic	Estimated Coefficient	Standard Error	Mean	Standard Deviation
Constant	-0.085*	-3.7	-5.261	0.222	N.A.	N.A.
Log of Medical Loss	0.023*	6.8	0.226	0.026	6.622	2.211
Scar Injury	0.120*	3.6	1.095	0.270	0.020	0.189
Sprain Injury	0.045*	4.2	0.301	0.082	0.632	0.660
Dead	0.111*	2.6	0.873	0.387	0.012	0.149
One-Car Accident	-0.139*	-11.3	-1.244	0.101	0.246	0.590
Passenger in Insured Vehicle	-0.093*	-7.9	-0.678	0.087	0.300	0.627
Pedestrian or Bicyclist	0.318*	7.3	2.066	0.329	0.020	0.191
Hired Attorney	0.414*	34.0	3.771	0.142	0.385	0.666
Mandatory Third-Party Insurance	0.027*	2.6	0.247	0.081	0.698	0.628
Claimant Negligence Less than 50 Percent	0.473*	34.4	4.181	0.148	0.660	0.648
Claimant Negligence 50 Percent	0.284*	7.7	2.574	0.274	0.017	0.177
Claimant Negligence Missing	0.199*	6.6	2.307	0.257	0.046	0.285

Note: $R^2 = 0.63$, f ratio = 620, root mean squared error = 0.41, sample size = 4,343, chi square = 5,145.

^a Dependent variable = 1 if claimant received any third-party auto insurance compensation, 0 otherwise (mean = 0.546; standard deviation = 0.682). Except for the logarithmic variables, all others are categorical with variable = 1 if applicable to claimant and 0 if not.

* Significantly different from zero at the .05 level.

We applied the relevant model to each claim in each closed-claim file (or used actual data on collateral claims if available from the file) and adjusted the weight attached to the claim to reflect the likelihood that the claimant had also received compensation under another coverage. The weights allowed us to merge the closed-claim files to obtain an "unduplicated" representative sample of auto accident victims who received compensation from one or more auto insurance claims.¹³

Finally, we used the IRC consumer panel data to extend the data base to accident victims who received no auto insurance compensation. AIRAC (1988)

¹³ Because UIM claims are always duplicative of other auto insurance claims, they were not considered in building the sample of people compensated by one or more forms of auto insurance. We did take into account UIM coverage in analyzing the total amount of compensation provided for an injured party.

provided data on the experiences of households in which someone had suffered an injury in an auto accident between October 1982 and March 1986.¹⁴ We weighted the IRC consumer panel observations according to the stratified sample design and the response rate within each strata. We then extracted the observations for accident victims who received no compensation from any form of auto insurance and merged them with the closed-claim data. In merging the data, the weights for the observations drawn from the consumer panel survey were adjusted so that the final weighted data base of injured people contains the same proportion of no-auto-insurance-compensation observations to any-auto-insurance-compensation observations that exists in the consumer panel survey.

Next, the compensation outcomes of the accident victims in the tort state sample were calculated (see Carroll et al., 1991, Appendix D, for details). Actual compensation outcomes were used for reported claims, and a series of models was developed to estimate the outcomes for collateral claims. For example, the BI closed claim file provided the BI compensation a BI claimant received. We estimated the conditional amount of MedPay compensation the claimant would have received if he or she had obtained MedPay.

We used the BI and UM closed-claim data to model the amount of BI and UM compensation a claimant receives, given relevant characteristics of the claim, such as injuries, losses, negligence, attorney involvement, etc. Separate models were constructed by state for people who died or who suffered permanent total disability. Censored regression techniques were used to account for the possibility that a claimant's observed compensation might have been constrained by policy limits. We combined the estimates for BI and UM, weighting for the probability of each, to obtain expected third-party auto insurance compensation. Similarly, the MedPay closed-claim data were used to model the amount of MedPay compensation a claimant receives, given his or her medical costs.

We pooled the BI and UM data by state to estimate state-specific models predicting the expected time to initial payment and time to final payment of third-party compensation, given relevant characteristics of the claim, such as injuries, losses, attorney involvement, etc. Similarly, we used the MedPay closed-claim data to model time to initial MedPay compensation by state given the claimant's injuries, losses, and attorney involvement.

Kakalik and Pace (1986) compiled data on claimants' attorney fees and other legal costs to estimate claimants' transaction costs in auto insurance (and other) compensation claims. A number of plaintiffs' attorneys across the country were interviewed to see if the conclusions of that analysis were still valid. In brief, we were assured that the general patterns in claimants'

¹⁴ National Family Opinion, Inc., screened 200,000 households in a national panel to identify those in which a member had suffered an injury in an auto accident within the previous three years. A follow-up survey of households identified as having been involved in an injury-producing accident obtained detailed information on the accident and the amounts and sources of any resulting compensation.

transaction costs reported in our earlier study still applied in auto insurance compensation claims. We, therefore, rely on their results to estimate claimants' legal fees.

Detailed claim-level information on insurers' transaction costs are not available. Data from several sources were combined to estimate defense transaction costs. A. M. Best (1989) provides nationwide ratios of total insurers' transaction costs to compensation (including both allocated costs—costs incurred on behalf of and directly attributed to a specific claim—and unallocated, or general claim-processing costs) for all lines of private-passenger auto liability insurance combined. The Insurance Services Office (ISO, 1990) provided estimates of transaction costs to compensation ratios, disaggregated by property damage versus personal injury coverages and by allocated versus unallocated transaction costs. The ISO also provided data on average insurers' transaction costs and compensation paid on a very large national sample of claims, by line, for personal injury auto insurance coverages. The ISO ratios were adjusted to match the A. M. Best national average data to estimate nationwide allocated-cost-to-compensation ratios and nationwide unallocated-cost-to-compensation ratios for auto personal injury auto insurance coverages, by line of insurance.

The resulting data base describes and estimates the auto insurance compensation experience (amounts, sources, times, and transaction costs) of a nationally representative sample of people injured in auto accidents.

Modeling Claiming Behavior in a No-Fault System

The compensation an injured person obtains under a specified no-fault alternative depends on whether he or she receives only PIP compensation, only BI compensation,¹⁵ both, or neither. We used the data on the compensation experiences of persons injured in the no-fault states to model the types of compensation an auto accident victim receives in a no-fault system. Because the actual source of compensation depends on whether the injured person is over the threshold for the specific alternative, our models consider the injury, disability, and economic loss in relation to the no-fault threshold.¹⁶

¹⁵ We use the term BI to include UM insurance, which substitutes for BI when the injurer is uninsured and the injured has UM coverage.

¹⁶ Because accident victims in no-fault states can obtain BI compensation only if they pass their state's threshold, we defined thresholds on the basis of the injuries claimed by BI recipients in the no-fault states. Because virtually all BI recipients in Florida, Michigan, and New York claimed one or more of the following: death, permanent disability, permanent brain injury, loss of a body part or of a sense, severe scarring or disfigurement, or any "severe" injury, we defined a "strong" verbal threshold as comprising these injuries and assumed that any victim in these states was over the threshold if they had one or more of these injuries. Virtually all BI recipients in the dollar threshold states whose medical expenses were less than the dollar threshold had one of the above injuries or a fracture, or permanent scarring or disfigurement, or a "moderate" injury. We defined the verbal component of a dollar threshold as the injuries included in the strong verbal threshold plus any fracture, permanent scarring or disfigurement, or any "moderate" injury. We

The probability that someone will receive PIP compensation under a no-fault system depends on whether that person is covered by PIP insurance and makes a claim. We used our data on accident victims in no-fault states who did not receive any third-party compensation to model the likelihood of PIP compensation, given no BI claim. We included variables we thought might be related to the purchase of PIP insurance (such as being a motorcycle driver, a category often excluded from mandatory PIP insurance purchase) or to claiming behavior (such as the size of medical loss, on the theory that low losses might be less likely to be claimed). Specifically, the variables tested included medical loss, work loss, type of injury, extent of disability, the victim's status (driver, pedestrian, bicyclist, or motorcyclist), age, sex, and marital status, the number of cars in the accident, the mandatory PIP limits,¹⁷ whether an attorney was hired, several alternative variables for negligence, and whether BI insurance was mandatory.

The probability of receiving PIP decreased slightly if the injured person was a pedestrian or bicyclist and decreased substantially if the injured person was a motorcyclist and, hence, less likely to be covered by PIP insurance. None of the other variables was statistically significant.

Whether an accident victim receives BI compensation under a no-fault auto insurance system depends on at least four factors: (1) whether the injury exceeds the threshold for receipt of BI compensation, (2) whether the injured person files a claim, (3) whether the person claimed against is negligent, and (4) whether the person claimed against has auto insurance (or the claimant has UM insurance). We used the PIP closed-claim data to estimate the probability of receiving BI compensation, given PIP. Because of the strong influence of the threshold on receipt of BI compensation, separate models were constructed for people who were over and people who appeared to be under the threshold. The variables tested were the same as those examined in modeling the probability of receiving any PIP compensation.

For PIP claimants who were over the threshold, we found statistically significant increases in the probability of BI compensation as medical loss increases; if the injured person has an injury, such as a sprain or a bad scar that might not be adequately reflected in high medical bills; or if the claimant has relatively low negligence. The most significant predictive variable, however, was whether the claimant hired an attorney.

For PIP claimants who appeared to be under the threshold, the analysis showed a substantially lower probability of BI compensation than if the injured person had been over the threshold.¹⁸ Again, the probability of BI compensa-

assumed that any victim in a dollar threshold was over their state's threshold if their medical expenses exceeded the dollar threshold or if their claimed injuries matched the verbal threshold.

¹⁷ PIP insurance is mandatory in all no-fault states.

¹⁸ Injuries vary in their seriousness. Even a sprain or strain can be relatively serious. Someone whose injury does not apparently conform to the verbal threshold or the verbal component of a dollar threshold might still obtain BI compensation if the claims adjuster considers their injuries particularly serious. And a claims adjuster might pay a BI/UM claim even though it fell below a

tion increases with medical loss, for certain injuries, such as a sprain or a scar, and if the injured person has relatively low negligence. Relatively few claimants who appeared to be below the threshold in a no-fault state were represented by lawyers. We therefore did not include a lawyer variable in modeling the probability of BI compensation for PIP claimants who were under the threshold.

For people who received BI compensation, the probability of also obtaining PIP compensation depends on whether that person is covered by PIP insurance and makes a claim. We used the BI and UM closed-claim files to estimate the probability of receiving PIP compensation, given BI. The probability of claiming PIP compensation increases slightly as medical and work loss increases and substantially decreases if the injured person is a motorcyclist and therefore less likely to be covered by PIP insurance. None of the other variables was statistically significant.

Simulating the Effects of Alternative No-Fault Plans

We applied the models described above to our samples of auto accident victims from the tort states to predict the sources and amounts (conditional on source) of compensation each person would receive under each of a number of no-fault alternatives.¹⁹ Because the source of an accident victim's compensation under the traditional system provides some important information regarding the kinds of compensation they are likely to receive under a no-fault plan, we take into account each person's sources of compensation under the traditional system.

Consider people who did not receive any auto insurance compensation under the traditional system. They either lacked access to third-party auto insurance compensation (e.g., because they were entirely responsible for the accident or because the other party was uninsured and the injured person did not have UM coverage) or chose not to claim against any other party (e.g., because they did not feel the amount of third-party compensation potentially available to them was worth the trouble of pursuing a claim). No-fault plans never make third-party compensation more accessible or attractive than it was under the traditional system. If anything, the threshold reduces accessibility to third-party compensation. Accordingly, we assumed that a person who did not receive any auto insurance compensation in a tort state would not receive any third-party compensation under an alternative no-fault plan.

dollar threshold if he or she thinks that disputing the claim might induce the claimant to incur additional medical costs.

¹⁹ We assume the same distribution of accidents and the resulting injuries as actually occurred under the traditional system. Landes (1982) suggested that the adoption of a no-fault compensation system may increase the frequency of accidents and injuries. However, subsequent analyses of accident and injury frequency in the United States have concluded that a no-fault compensation system does not have a significant effect on auto accidents and injuries (U.S. Department of Transportation, 1985; Kochanowski and Young, 1985; Zador and Lund, 1986; and Cummins and Weiss, 1992). Devlin (1990) found that Quebec's no-fault plan had a small effect on injuries.

People who did not receive any auto insurance compensation under the traditional system also either lacked access to first-party compensation (e.g., because they had not purchased MedPay auto insurance) or chose not to claim against their first-party insurance. Drivers who choose not to claim may not feel the amount of first-party auto insurance compensation available to them was worth the effort, may already have collected from health insurance, or may not want to tell their auto insurer about the accident and risk an increase in next year's insurance premium. No-fault plans mandate first-party coverage. While some drivers will go uninsured despite the mandate, some drivers who did not purchase optional MedPay auto insurance will obtain PIP coverage when it is mandatory, increasing the likelihood that an injured person will have first-party auto insurance coverage. Also, PIP covers all economic losses. The incentive to seek first-party compensation when it is available is never smaller under a no-fault system than it was under a traditional system and is sometimes greater. Accordingly, we assumed that a person who did not receive any compensation in a traditional system may receive some first-party compensation under a no-fault system.

We applied our model of the likelihood of PIP compensation, given no BI, to those people who received no auto insurance compensation whatsoever under a traditional system to predict the probability that they would receive some first-party compensation under the specified no-fault plan.

Similarly, we modeled the probability that a person who received some compensation under a traditional system would receive some under no-fault, and if so, whether that person would receive only first-party compensation, only third-party compensation, or both. For each person who appeared to be under the threshold of the specified plan, our models predicted the conditional probabilities that someone who received PIP and was under the threshold would also receive BI and that someone who received BI would also receive PIP. We also computed the conditional probability that they would receive PIP if they did not receive BI. These predictions, and the requirement that the probabilities of receiving no compensation, PIP only, BI only, and both PIP and BI sum to one, are sufficient to compute the unconditional probabilities of the four compensation categories. A similar process was used to estimate the probabilities of the compensation categories for people who were over the threshold of the specified plan.

PIP compensation under a no-fault alternative has the general character of an entitlement: The amount of compensation depends only upon the individual's economic losses, subject to disallowance (if the legitimacy of some costs is questioned) and plan conditions (e.g., policy limits and deductibles). To simulate the amount of PIP compensation an individual would receive, conditional on their receiving any PIP, we took their economic loss, computed their compensation if the losses were fully covered, and adjusted for average disallowance under PIP and for specified plan limits and deductibles.

The amount of BI compensation provided to someone who surmounts a no-fault plan's threshold is determined in the context of the liability system. The state law regarding negligence and compensation, the local legal culture, the

attitudes of judges and jurors, and so forth influence the amount of compensation a person can receive through the liability system. We assumed that none of these factors would be affected by a change from a traditional to a no-fault system in a given state. For example, California's legal culture, judiciary and legal standards, and lawyers' and claims managers' views of a claim's value would not be substantially different if that state shifted to a no-fault system. Once a person passes the no-fault threshold, if our models predict that he or she would claim and receive third-party auto insurance compensation, the amount of his or her third-party compensation under a no-fault alternative would be determined by the same factors that determined his compensation in the traditional system.

Thus, if the injured person is to receive BI compensation in a no-fault environment, simulating the amount involves only observing the traditional system outcome and adjusting for plan characteristics under the no-fault alternative (e.g., a reduction in BI compensation to offset PIP compensation).

We described above the methods used to estimate time to payment and transaction costs in a traditional system. Similar methods were used to estimate and simulate time to payment for PIP and BI claims in a no-fault environment. The ratio of transaction costs to compensation for any given type of claim was assumed to be the same in either environment. For example, in a BI claim, transaction costs relative to compensation will be the same whether the claim is brought in a traditional system or in an alternative no-fault system.

Effects of an Illustrative No-Fault Plan

The specific effects of different no-fault plans vary, depending on the threshold and the PIP benefit level. Consider an illustrative no-fault plan with a verbal threshold and a \$15,000 policy limit.

Transactions Costs

The compensation provided for people injured in auto accidents in the tort states, including those who received no auto insurance compensation at all, averaged \$4,681.²⁰ Insurers' transaction costs (legal fees and claim processing costs) averaged \$793 per injured person. Overall, the total injury coverage costs of the traditional system averaged \$5,474 per injured person.²¹ We estimated that these same people, with the same injuries and losses, would have averaged \$3,764 in compensation with insurer's transaction costs of \$528 if they had been covered by the illustrative no-fault plan instead of the traditional system.

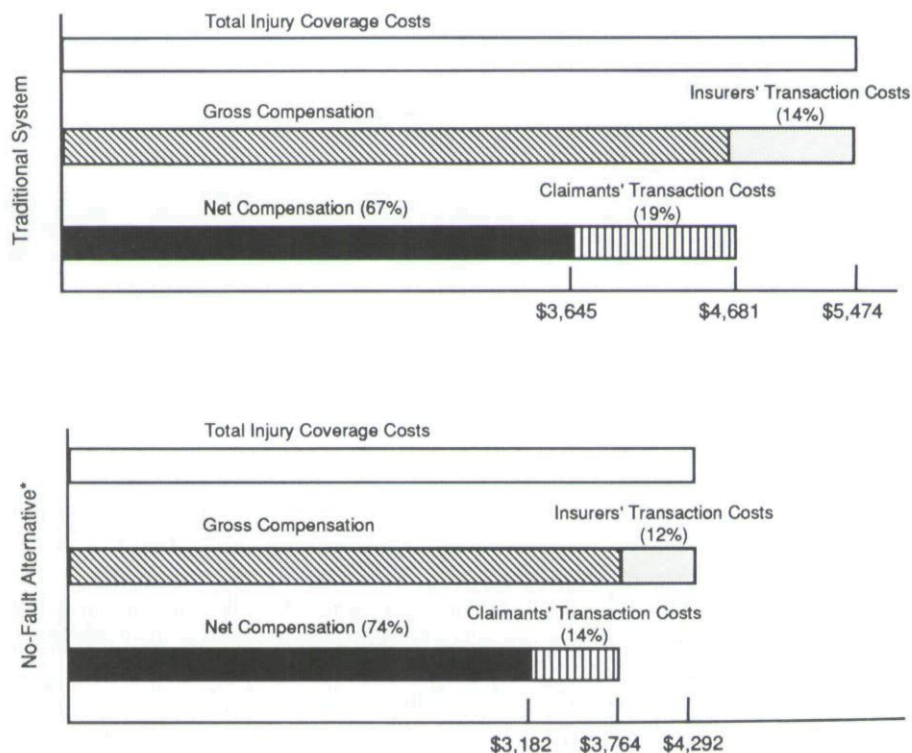
²⁰ All dollar amounts are adjusted for inflation and expressed in 1989 dollars.

²¹ Injury coverage costs include total compensation paid to a claimant (including whatever the claimant may spend on legal fees) for injuries by all types of auto insurance coverage, plus the insurers' legal fees and claim processing costs.

Compared to the traditional system, the no-fault plan would have reduced the total amount spent on compensating injured people by 22 percent.²²

The upper panel of Figure 1 shows the distribution of money spent on injury coverages in the tort states. Claimants spent an average of \$1,036 on their legal fees and other transaction costs, netting \$3,645. Adding the claimants' transaction costs to the \$793 in transaction costs incurred by insurers yields average total transaction costs of \$1,829 incurred per person in compensating injured people in tort states. This amounts to 33 percent of the total injury coverage costs incurred per injured party in the tort states.

Figure 1
Effects on Claimants' Net Compensation and Transaction Costs



The lower panel of Figure 1 shows the corresponding results for the illustrative plan. Under the no-fault plan, these same claimants' gross

²² Probabilistic variability leads to a 95 percent confidence interval on our estimate of total injury coverage costs of plus or minus 1 to 4 percent.

compensation would have averaged \$3,764, and their transaction costs would have averaged \$582, leaving them with net compensation of \$3,182.

Adding insurers' transaction costs (\$528 per person) to claimants' transactions costs, the total transaction costs under this no-fault plan would have averaged \$1,110. This amounts to about 26 percent of the total costs of injury coverages under the no-fault plan. Compared to the traditional system, this no-fault plan would reduce the share of total costs going to transaction costs from 33 percent to 26 percent.

These results demonstrate that savings can be achieved through reductions in transaction costs, but they also show that the amount of this savings is limited. In the traditional system, transaction costs account for one-third of total costs. The no-fault plan reduced transaction costs by about 39 percent. This translates into a 13 percent reduction in total injury coverage costs, relative to the traditional system. Thus, the no-fault approach to compensation can cut total injury coverage costs by cutting transaction costs. However, achieving a 22 percent reduction in total injury coverage costs, relative to the traditional system, also requires a reduction in net compensation.

Redistributing Compensation

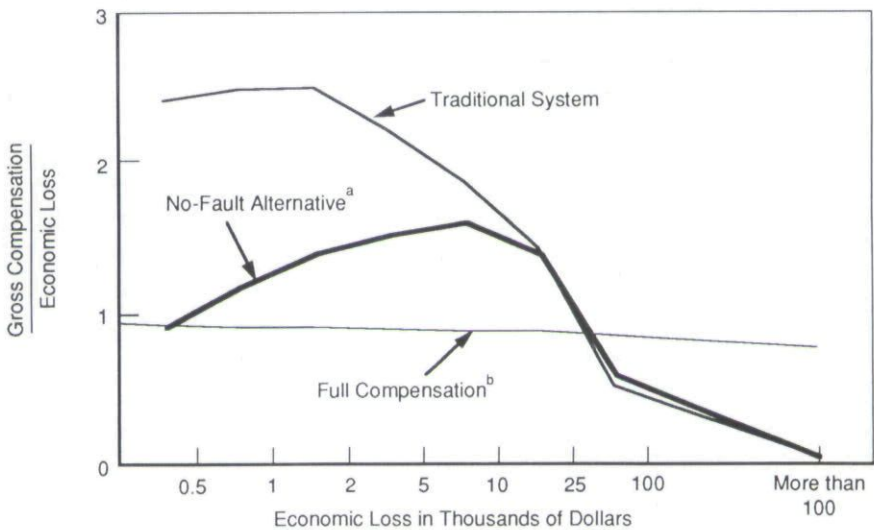
If the no-fault plan reduces compensation, how are the reductions likely to be distributed among claimants? Figure 2 plots economic loss versus the ratio of average gross compensation to economic loss, for both the traditional system and the no-fault plan. The line labeled "full compensation" is a plot of the level at which average gross compensation would fully compensate claimants for their medical expenses, plus after-tax wage loss.²³

In the traditional system, people whose economic losses are relatively small receive, on average, compensation considerably in excess of their economic losses. Many of these people obtained third-party compensation that included substantial amounts for noneconomic losses, such as pain and suffering. For example, the compensation received by people with less than \$2,000 in economic loss averaged about two and a half times their economic loss. At higher levels of economic loss, the ratio of average gross compensation to economic loss declines. Policy limits on BI and UM insurance often limit the compensation available to injured people with large losses. People who incurred very high economic losses receive compensation that, on average, is much less than their economic losses. At the extreme, the compensation received by people whose losses exceeded \$100,000 averaged about 9 percent of their economic losses.

The corresponding curve for the illustrative no-fault plan shows that it narrows the gaps between the gross compensation provided to injured parties and the amount required to fully compensate them for their economic loss.

²³ Compensation for wage loss is not subject to income taxes. Someone who incurred some wage loss as a result of an auto accident would be "made whole" or fully compensated if his or her compensation equaled their lost after-tax wages.

Figure 2
Effects on Compensation Relative to Economic Loss



^a Verbal threshold, \$15,000 PIP benefit level.

^b Full compensation equals net economic loss (medical costs, plus lost income net of taxes).

At lower levels of economic loss, where the traditional system tends to compensate well above economic loss, the no-fault plan generally provides less compensation. Few claimants with small economic losses manage to exceed the threshold. Consequently, most receive only PIP compensation, which compensates them for their economic losses but not for noneconomic losses. Occasionally, a claimant with a small economic loss does obtain third-party compensation and some compensation for noneconomic loss, bringing the overall average ratio of gross compensation to economic loss above the "full" compensation line. The widespread elimination of compensation for noneconomic loss when economic loss is small means that gross compensation under the no-fault plan is generally closer to economic loss than under the traditional system.

Although the no-fault system provides less compensation than the traditional system when losses are low, it still fully compensates people for their economic loss up to PIP policy limits. The curve for the no-fault plan lies above the "full compensation" reference line at lower levels of economic loss.

At very high levels of economic loss, where the traditional system typically provides gross compensation well below economic loss, the no-fault plan generally provides somewhat greater compensation than the traditional system. PIP benefits under the no-fault plan are more generous than the benefits generally available under MedPay. How much more compensation is provided depends on the PIP benefit limits specified in the no-fault plan. People with

large economic losses will receive greater compensation under the no-fault plan than under the traditional system.

In terms of the numbers of claimants affected in various ways by a no-fault approach to compensation, no-fault substantially reduces the proportion of claimants who receive compensation in excess of their economic loss and substantially increases the proportion of claimants who are fully compensated for their economic loss (see Table 2). Under the traditional system, 62 percent of the injured people receive compensation that exceeds their economic loss. In contrast, a no-fault plan combining a verbal threshold with a \$15,000 PIP benefit level would provide more than full compensation to less than a quarter of the injured. Under the traditional system, 27 percent of the people who suffered some economic loss as a result of an auto accident obtained less than full compensation from auto insurance. Under the illustrative no-fault plan, only 16 percent of these people would have ended up with less than full compensation for their economic loss.

Table 2
Effects of Illustrative No-Fault Plan on Distribution of Compensation

<i>Gross Compensation Economic Loss</i>	<i>Percent of Injured People</i>	
	<i>Traditional System</i>	<i>Illustrative No-Fault Plan</i>
More than 1½	56	19
1 to 1½	6	3
Full to 1	7	59
½ to Full	11	1
0+ to ½	4	2
0	12	13
No Economic Loss, Some Compensation	4	0
No Economic Loss, No Compensation	0	4

Four percent of the people in the data base for the tort states reported no injuries or losses but obtained some compensation from third-party auto insurance.²⁴ The amount of compensation involved was never very large, generally ranging from \$500 to \$1,000. These are presumably "nuisance" claims that an insurer thought cheaper to settle, despite the absence of a physical injury, than dispute. None of these people would have obtained compensation from auto insurance under the no-fault plan; they would not have passed the tort threshold and, so, would not have obtained any third-party compensation. Without any loss, they also would not have obtained any first-party compensation.

²⁴ Some of these observations may have been the result of data collection problems.

Speed of Payment

Under the traditional system, 45 percent of the people who obtained compensation from any form of auto insurance received an initial payment within three months of their accident. Another 23 percent received their initial payment between four and six months after the accident. Under the no-fault plan, the fraction of people whose first payment would have arrived within three months after their accident would be about the same as under the traditional system: 46 percent. The fraction of this population who would have received an initial payment between four and six months after their accident would be 39 percent, well above the corresponding figure for the traditional system. In sum, 85 percent of claimants would receive their initial payment from some form of auto insurance within six months of their accident under the no-fault plan, compared to 68 percent under the traditional system.

At the other extreme, 22 percent of the claimants had to wait seven to twelve months for their initial payment from any form of auto insurance under the traditional system, and 10 percent had to wait for more than a year. In contrast, under no-fault, only 15 percent would have had to wait more than six months, and fewer than 1 percent of claimants would have had to wait longer than a year.

Overall, compared to the traditional system, no-fault plans will speed the provision of compensation to injured parties by an average of two months.

The Design of a No-Fault Plan Influences Its Effects

No-fault approaches to compensation can yield substantial savings in total injury coverage costs, compared to the traditional system. However, whether any particular no-fault plan will reduce injury coverage costs and by how much depends on its provisions. Some no-fault plans that provide very generous PIP benefits may actually increase the total injury coverage costs of the system.

Table 3 shows the effects of ten different no-fault plans on total injury coverage costs. One is the plan discussed in detail above (\$15,000 PIP benefit level, verbal threshold). Two other plans have the same threshold but successively higher PIP benefit levels—\$50,000 and \$250,000. Three additional plans demonstrate the effect of adopting a \$5,000 threshold at each of the three PIP benefit levels. Two plans show the effects of a \$1,000 threshold with either a \$15,000 PIP benefit level or a \$250,000 PIP benefit level. The last two plans show the effects of an absolute ban on access to the liability system combined with either a \$50,000 PIP benefit level or unlimited PIP compensation for economic loss.

Other things being equal, a higher threshold provides greater savings of total injury coverage costs by shifting claimants from BI compensation, which provides compensation for both economic and noneconomic loss, to PIP, which covers only economic loss. However, by reducing the amounts paid in compensation for noneconomic loss, a higher threshold also reduces claimants' average compensation.

Table 3
Effects of Alternative No-Fault Plans
on Percent Change in Total Injury Coverage Costs

<i>PIP Benefit Level</i>	<i>Threshold</i>			
	<i>\$1,000</i>	<i>\$5,000</i>	<i>Verbal</i>	<i>Absolute Ban</i>
\$15,000	-12	-14	-22	^a
\$50,000	^a	-6	-12	-52
\$250,000	13	11	5	^a
Unlimited	^a	^a	^a	-29

^a Plan not examined.

Higher thresholds also bring greater reductions in transaction costs. At the extreme, an absolute ban on compensation for noneconomic loss would eliminate over three-quarters of the transaction costs incurred in the traditional system.

Higher PIP benefit levels increase injury coverage costs for any given threshold. On average, more money is paid out in compensation when the PIP benefit level is higher. The PIP benefit level does not have a substantial effect on transaction costs.

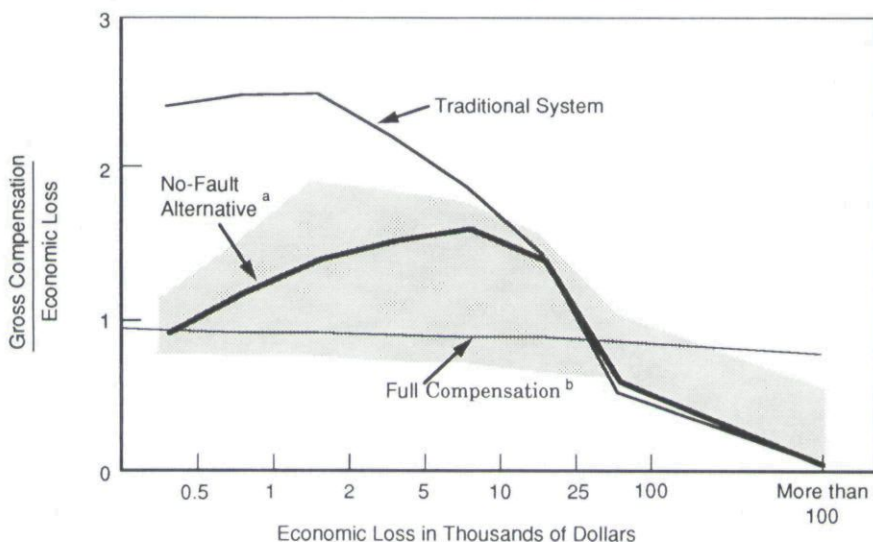
We also examined the effects of imposing a \$500 deductible on PIP compensation. A PIP deductible reduces total injury coverage costs and claimants' net compensation by a small percentage. It does not have a substantial effect on transaction costs. A PIP deductible would decrease the share of economic loss compensated. A PIP deductible has a dramatic effect on the percentage of injured people compensated by auto insurance, eliminating compensation to those whose economic losses are less than the deductible.

A provision mandating that injured persons covered by private health insurance collect as much of their medical costs as possible from their health insurer rather than their auto insurer would reduce spending on auto insurance compensation dramatically. For example, the 22 percent savings in the illustrative no-fault plan would jump to 33 percent savings with a health insurance offset. Health insurance offsetting would also decrease the amount that injured people take home from auto insurance sources. However, an auto insurance payment offset for health insurance payments would increase health insurance costs if it increased health insurance claims.

Figure 3 plots the ratio of average total compensation to economic loss versus economic loss for the traditional system and for the illustrative no-fault alternative. It also shows the area that encompasses similar plots for the nine other no-fault plans noted in Table 3. These plans' thresholds vary from a low dollar threshold to an absolute ban; their PIP benefit levels vary from \$15,000 to unlimited compensation for medical expenses. That is, a plot of the ratio of average total compensation to economic loss for any of the no-fault alternatives would fall entirely within the shaded area in Figure 3. The shaded area shows that the no-fault alternatives tend to narrow the gaps between compensation and economic loss. Each alternative reduces the compensation for people with

relatively small losses and increases the amount of compensation being paid to people with relatively large losses.

Figure 3
Effects on Compensation Relative to Economic Loss



Verbal threshold, \$15,000 PIP benefit level.

Full compensation equals net economic loss (medical costs, plus lost income net of taxes).

Interstate Variations in the Effects of No-Fault

The effects of any particular no-fault plan vary from one state to another, depending on local factors. Thus, introducing a Michigan-style no-fault plan in California may not produce exactly the same results. To examine the degree to which interstate variations in local factors influence the performance of no-fault alternatives, we simulated the effects of each of the no-fault alternatives for all tort states combined, for each of the four largest tort states—California, Illinois, Indiana, and Ohio—and for all other tort states combined.

Table 4 presents the effects of seven different no-fault plans on total injury coverage costs, relative to the traditional system, for all tort states combined and for California and Ohio, individually. The no-fault plans incorporate a broad range of thresholds and PIP benefit levels. We exhibit the results for California and Ohio because the results for these two states were generally at the extremes; the corresponding results for other states that retain the traditional system generally fall between the results shown here.

The effects of any particular no-fault plan on total injury coverage costs, relative to the traditional system, differ from one state to another. These differences are sometimes very large. For example, averaged over all tort states, a plan combining a strong verbal threshold with a \$250,000 PIP benefit level would increase total injury coverage costs, relative to the traditional system,

Table 4
Effects Vary from State to State,
But Relative Rankings Are Consistent

<i>No-Fault Alternative</i>		<i>Percentage Change in Total Injury Coverage Costs by State</i>		
<i>Threshold</i>	<i>PIP Benefit</i>	<i>All Tort</i>	<i>California</i>	<i>Ohio</i>
Absolute Ban	Unlimited	-29	-46	-19
Strong Verbal	\$15,000	-22	-24	-18
\$5,000	\$15,000	-14	-16	-10
\$1,000	\$15,000	-12	-13	-8
Strong Verbal	\$250,000	+5	-7	+12
\$5,000	\$250,000	+11	-1	+20
\$1,000	\$250,000	+13	+2	+21

by about 5 percent. However, in California this alternative would yield savings of 7 percent, and in Ohio it would increase injury coverage costs by 12 percent.²⁵

The differences across states reflect differences in three kinds of factors that bear on the total costs of the auto injury compensation system: the underlying distributions of injuries and amounts of losses, individuals' claiming behavior, and the amount of compensation provided, given the claimant's injuries and losses. Table 5 provides selected measures of these factors for each state under the traditional system.

Table 5
Selected Descriptive Measures of Interstate Variations in Factors
that Affect Total Injury Coverage Costs

<i>Measure</i>	<i>California</i>	<i>Illinois</i>	<i>Indiana</i>	<i>Ohio</i>	<i>All Other States</i>
Percent of Claimants with Medical Loss < \$500	33	49	59	54	52
Percent of Claimants with Attorney Representation	52	45	19	37	30
Percent of Claimants Receiving Third-Party Compensation	80	75	67	65	69
Average Compensation (\$) to Claimants with Economic Loss of \$1,000-\$2,000	4,045	3,032	3,247	3,243	3,545

The distributions of injuries and amount of losses determine the fraction of injured people affected by any particular threshold. For example, only 33 percent of the people injured in California auto accidents had less than \$500

²⁵ Corresponding results for Illinois, Indiana, and "all other" tort states exhibit similar disparities (see Carroll et al., 1991, Appendix G).

in medical expenses and would be affected by a \$500 threshold. In contrast, 59 percent of Indiana claimants would be affected by a \$500 threshold.

Claiming behavior also influences total injury coverage costs under a no-fault plan. No-fault compensation plans shift claimants from liability-based third-party compensation to first-party compensation. It involves fewer disputes and, therefore, lower transactions costs and excludes compensation for noneconomic losses. The opportunities for savings on transactions costs are greater in a state like California—where 52 percent of the people injured in auto accidents hired an attorney—than in a state like Indiana—where 19 percent of claimants hired an attorney. Similarly, greater savings can be realized in a state like California—where 80 percent of claimants obtained third-party compensation under the traditional system—than in a state like Ohio—where 65 percent of claimants obtained third-party compensation under the traditional system.

Third, interstate differences in the amount of compensation provided for given injuries and losses affect the degree to which a no-fault plan affects total costs. The behaviors of judges and juries and the consequent expectations of claims managers and attorneys affect the “value” of a claim. The effect of a no-fault plan depends, in part, on the “values” of the claims it affects. For example, Californians whose economic losses were between \$1,000 and \$2,000 averaged \$4,045 in compensation under the traditional system. In Illinois, people whose economic losses fell into that range averaged \$3,032 in compensation under the traditional system.

Although the results vary across states, the relationships among the plans in each state are consistent. For example, when the plans are ranked in order of their effects on total injury coverage costs, the result is virtually identical in each individual state and for all traditional system states combined. If one plan yields greater savings than another in any one state, it almost always yields greater savings than the other in every other individual tort state and for all tort states combined.

Policy Implications

The results presented above consider the effects of no-fault plans averaged over all tort states combined. However, as shown above, the effects of any particular no-fault plan will differ from state to state. When injuries are greater and losses higher, a larger proportion of the people injured in auto accidents will pass any given threshold. In a state characterized by extensive third-party claiming activity, the reductions in transaction costs and compensation for noneconomic loss will be much greater, and the resulting savings will be much larger. A no-fault plan will have a much greater effect on total injury coverage costs, and on compensation, in a state in which claimants tend to receive greater compensation for their noneconomic losses.

All no-fault plans have some effects that hold true from state to state, although the magnitude of the effects will vary:

All no-fault plans reduce transaction costs, regardless of plan provisions. No-fault plans that entirely ban access to the liability system reduce transaction costs by about 80 percent. Those that would allow seriously injured people to pursue liability claims would reduce transaction costs by about 20 to 40 percent; the latter translates into a reduction in total injury coverage costs of approximately 10 percent.

No-fault plans match compensation more closely with economic loss. No-fault plans do this by increasing the fraction of economic loss that is compensated and by reducing the amount of compensation that exceeds economic loss by reducing payouts for non-economic loss. Injured people with smaller losses tend to recover amounts approximating their medical costs and lost wages, while those more seriously injured recover a larger share of their losses because they can collect both PIP and liability compensation.

No-fault plans eliminate compensation for noneconomic loss, such as pain and suffering, for injured people below the threshold.

No-fault plans generally speed up compensation. Injured people begin receiving payments on average about two months sooner under no-fault plans than under the traditional system.

However, some other effects of alternative no-fault plans are substantially different. Under different no-fault alternatives, total injury coverage costs may decrease, possibly dramatically, or may increase, possibly dramatically, depending upon the threshold and the PIP benefit level. The bottom line is that no-fault approaches to compensation can yield substantial savings over the traditional system. Whether or not any particular plan will reduce total injury coverage costs and, if so, how much depends on its provisions.

Our study focuses on the costs of injury coverage. However, auto insurance premiums are based on several considerations above and beyond these costs, including property damage costs, underwriting costs, overhead costs, and market factors in the insurance industry. Without a thorough analysis of these considerations, it is impossible to estimate exactly how no-fault plans would affect premiums. However, injury costs are a large element in overall auto insurance costs. Therefore, reduction in injury coverage costs should lead to reduction in premiums. The exact amount of this reduction remains unclear.

We make no policy recommendations about the merits of traditional versus no-fault systems. Our goal is to provide policy-makers with an empirical framework for thinking about the trade-offs implicit in auto insurance compensation systems and to clarify the difficult choices involved.

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