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Damage Schedules and Their Potential in Mitigating Adverse Selection in the Products Liability System

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DAMAGE SCHEDULES AND THEIR POTENTIAL IN MITIGATING ADVERSE SELECTION IN THE PRODUCTS LIABILITY SYSTEM

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Damage Schedules and their Potential in Mitigating Adverse Selection in the Products Liability System

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1. Introduction.

Under current products liability law, whereby producers of goods and services may be held liable for losses from the use of their products, consumers acquire an implicit insurance contract with the products they purchase.[1] When sellers cannot discriminate ex ante among risk types, all consumers pay the same price for the insurance component of the product bundle. The insurance coverage and the value of the insurance, however, may differ considerably among potential consumers, in part because product liability awards are based on victim-specific characteristics. Compensation for lost income, for example, varies by profession. In addition, Viscusi (1988) finds that both the probability of awards for pain and suffering being granted and their size depend on individual characteristics.

In their analyses of the allocative and redistributive effects of products liability, Bishop (1983), Epstein (1985), Priest (1987), and Schwartz (1988) explain that the lack of ex ante discrimination in the pricing of the insurance combined with the ex post variation in damage awards leads to an adverse selection of consumers from an insurer's point of view and also results in cross subsidization among actual consumers. The frequency with which consumers with low expected losses buy the product declines because the insurance component is, for them, overpriced. Those consumers with low expected losses who do buy the product subsidize consumers with higher expected losses. According to Priest (1987), the expansion of tort liability since the early 1960's (e.g., limits on contributory negligence defenses) increased the variance of expected losses in consumer risk pools and thus worsened the adverse selection problem among consumers.[2] The consequences include costly efforts by producers to segregate risk groups,

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[1]Manufacturers are strictly liable for manufacturing defects, but a negligence rule applies to design and warning defects. Priest (1985) reviews the development of products liability law. See Oi (1973), Spence (1977), and Epstein (1986) for discussions of bundling accident insurance with products.

[2]Priest also argues that the expanded liability increased variance of expected losses in producer risk pools, and that the aggravated adverse selection problem at that level severely impaired the supply of products liability insurance to producers. This consequence of expanded liability is central to his analysis of the products liability crisis. Two elements of Priest's argument are (i) the expansion of liability affected companies differently, and (ii) insurer and corporate estimates of risk under the new legal regime were less likely to converge. He also argues that the change in legal regime increased the correlation among producer liability risks, increasing the cost of diversification. The consequences of the supply problems include sharp increases in insurance premia (reflecting changes in the pool of remaining risks), greater self-insurance, greater reliance on insurance mutuals, the withdrawal of some insurance, and changes in the insurance contract.

higher product prices, and disproportionate effects on lower income consumers.[3] In some circumstances, markets cannot survive the adverse selection problem and products are withdrawn.

Can the products liability system be improved? In contrast to the substantial literature analyzing the effects of alternative liability rules,[4] in this paper we take the existing products liability framework as given and investigate compensation schemes, such as damage schedules, that would reduce the variance in products liability *awards*. The underlying premise -- that solutions to adverse selection problems may lie in reducing the variance of expected losses in a risk pool -- is not novel and derives from fundamental insurance principles. Insurers often use coverage ceilings and exclusions to make insurance premia more attractive to lower risk customers who would otherwise select out. Priest (1987) argues as well that a variety of tort reforms including caps on damages and the abrogation of the doctrine of joint and several liability can improve the market for products liability insurance by reducing the variance in producer risk pools. The issue of whether damage schedules mitigate the adverse selection problem among potential consumers of a given product, however, has not been analyzed.[5] One of our objectives is to provide further insights into the merits of recent proposals to establish schedules or cap non-economic losses. The American Law Institute, for example, recommends that juries be provided a schedule of dollar amounts for specific injuries when determining awards and that limits be placed on awards for pain and suffering.

We proceed in Section 2 by modeling the sale of a product to heterogeneous consumers. Using the price and output equilibrium in a perfect insurance market as a benchmark, we analyze the market under (i) the current system of ex-post award discrimination, and (ii) alternative compensation rules that eliminate the dependency of ex-post awards on victim-specific characteristics. We show that uniform compensation to all victims suffering the same accident, i.e., a damage schedule, counteracts adverse selection if consumers are at least partially informed

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[3]Since the losses from product failure are positively correlated with income, Priest emphasizes that the pattern of compensatory awards is regressive. Epstein (1985, p. 660) identifies other forms of cross subsidization: "If the skillful and the incompetent, the watchful and the careless must be treated as falling within a single risk classification, then the former must subsidize the latter." [p. 660]

[4]Prominent studies include Danzon (1984) and Shavell (1980, 1987).

[5]Discussions of damage schemes by Danzon (1984), Viscusi (1988), Bovbjerg, et al. (1989), Blumstein et al. (1990), and Schuck (1991) have emphasized their potential benefits in curbing cross subsidization and reducing administrative costs.

about product risk and the compensation system. We discuss the model's implications in Section 3, taking into account the role of non-economic losses, transaction costs, and incentives for care. We offer concluding remarks in Section 4.

2. Compensation Schemes in Products Liability.

Consider a market for a product that may harm consumers. In general, a victim's loss depends on the accident state and the person's sensitivity to the accident state. One accident state may be a product-caused injury that prevents the consumer from working for a month; another is a more severe injury where the consumer cannot work for a year. A consumer's sensitivity to the accident state determines the losses suffered. The monetary loss for a surgeon who misses a month of work, for example, will be greater than the loss for an auto mechanic suffering the same fate. Initially, we assume that the only losses arising from the use of products are economic losses. These considerations can be summarized in the following statement identifying the loss (L_i) to a consumer of type i:

$$L_i = \beta_i \tilde{Z} , \tag{1}$$

where $\tilde{Z}$ is a non-negative random variable with mean μ identifying the accident state and $\beta_i > 0$ is the sensitivity of risk type i. To abstract from moral hazard issues, we assume that the probability distribution of $\tilde{Z}$ is independent of the products liability system.

Adverse selection may occur either when consumers differ in their sensitivity to the accident state or when the probability distribution of $\tilde{Z}$ differs by consumer type. We analyze the case where the distribution of $\tilde{Z}$ is the same for all consumers. Thus, in our analysis the source of the potential adverse selection problem lies in different sensitivities of consumers. We consider two groups of consumers: low-loss consumers have a lower sensitivity (β_L) than high-loss consumers (β_H).

Both types of consumers decide whether to purchase one unit of the product. Within the low- and high-loss groups, we assume that there is a continuum of potential consumers distributed uniformly on the interval [0,1] and ordered by their willingness to pay for the product if there is no accident risk. Consumer 0 has the highest reservation price and consumer 1 has the lowest reservation price. R(x) indicates the reservation price for consumer $x \in [0,1]$. The ordering of consumers implies that R(x) is a non-increasing function and allows us to identify easily the proportion of potential consumers who purchase the product. For example, if

consumers on the interval [0,0.4] purchase the product, then the proportion of actual consumers is 0.4. For simplicity, we also assume that the reservation price function is the same for each risk group.

We analyze the market under competitive conditions and zero production costs. Therefore, the product price reflects only the cost of providing liability insurance. The analysis below indicates that the price and quantity equilibrium depends on various factors, including whether the price of insurance to consumers varies by risk type, the compensation scheme, and the extent to which consumers are informed about the risks they face.

2.1. The Benchmark Case: Perfect Insurance Market.

In a perfect insurance market -- where consumer have complete information about product risks and there are no transaction costs -- consumers would be offered full accident insurance at actuarially fair prices. The effective price to each consumer would equal his or her expected accident cost: $\beta_L\mu$ to low-loss types and $\beta_H\mu$ to high-loss types.

Under these conditions individual consumers of each type would purchase the product if their reservation prices exceeded their effective product price. The *marginal consumer* for low- and high-loss types, denoted x_L^* and x_H^*, is the consumer whose reservation price equals the effective price (P_i) for his or her type. Algebraically,

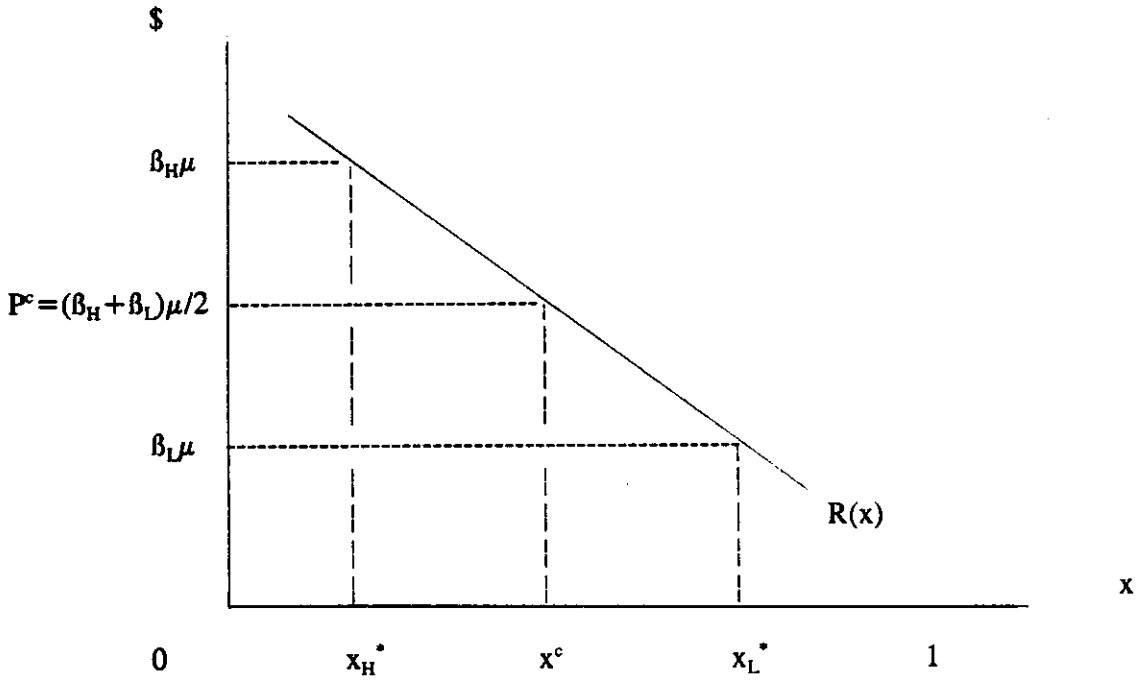
$$\begin{aligned} R(x_L^*) &= \beta_L\mu = P_L \text{ , and} \\ R(x_H^*) &= \beta_H\mu = P_H \text{ .} \end{aligned} \tag{2}$$

Given the assumption that the schedule of reservation prices is identical across groups, the proportion of low-loss consumers who purchase the product, x_L^*, is greater than the proportion of high-loss consumers who do so, x_H^*.[6] Figure 1 illustrates this result. Since the price each consumer pays equals his or her expected loss, there is no cross-subsidization between the two groups of consumers. Nor does any adverse selection occur: Only those consumers whose valuation of the product exceeds the sum of production costs and expected losses from using the product buy the product.

[6]An equilibrium with the characteristic that a higher proportion of low-loss consumers purchase exists provided $\beta_L\mu$ is less than the reservation price of the consumer with the highest reservation price, R(0).

Figure 1

The Perfect Insurance Market versus the Current System



2.2. The Current System.

Courts operating under the current product liability system attempt to mimic the perfect insurance market by compensating victims for their actual losses, $\beta_i\tilde{Z}$. But the provision of insurance through the tort system differs from the perfect insurance market in that most sellers cannot easily discriminate ex ante among risk types nor can they vary the coverage offered.[7] Even when risk groups can be identified, the virtual elimination of the so-called privity requirement that at one time barred suits by remote purchasers severely limits the ability of sellers to control their exposure to high-risk consumers.[8]

When sellers cannot discriminate among consumers, the product price will be a weighted average of the expected accident costs of actual consumers. In our model, with identical reservation price schedules for low- and high-loss consumers, an equal proportion of consumers of each type will purchase the product and, as a result, the equilibrium price will be a simple average of the expected losses for low- and high-loss consumers:

$$P^c = (\beta_L + \beta_H)\ \mu\ /\ 2. \tag{3}$$

Figure 1 also illustrates this outcome. The marginal consumer, x^c, for each type is the consumer whose reservation price equals the product price. That is, x^c satisfies $R(x^c)=P^c$. Compared to the perfect insurance case where the proportion of low-loss consumers (x_L^*) exceeded that of high-loss consumers (x_H^*), the current system encourages too many high-loss

[7]Another salient difference between the product liability system and a perfect insurance market are the substantial transaction costs incurred in providing product liability insurance through the legal system. Plaintiffs must establish that the product was defective according to the operative legal standard. A manufacturer is usually held liable for losses if the product has a manufacturing defect or a warning defect. In some states, manufacturers may argue that consumers voluntarily assumed the risk or that consumers contributed to the loss by misusing the product. See Schwartz (1988) for a further discussion of liability rules. Legal error is also an important issue. The fact that some producers are not sued and that others may succeed in their defense against valid claims does not bear on the problems of adverse selection and cross subsidization unless the frequencies of successful claims is systematically related to consumer type.

[8]Warranties for product failures, in contrast, may be limited to the original purchaser. For a discussion of the weakened privity requirement, see Epstein (1985, pp. 654-63).

consumers to purchase and too few low-loss consumers to purchase.[9] The implicit subsidy to high-loss consumers is the difference between the expected compensation and the price paid for the insurance, i.e., $\beta_H\mu$ - P^c. Similarly, the tax paid by low-loss consumers equal P^c - $\beta_L\mu$.[10] Note that the assumption of identical reservation price schedules for low- and high-loss consumers implies that the market will not unravel, i.e., not all low-loss consumers will select out of the market, leaving only high-loss consumers purchasing the product. But in other settings, the adverse selection may cause the market to unravel with the result that only high-loss consumers buy the product.[11]

The increment to the average cost of accident insurance between the current system and the benchmark case, ΔAC, is the difference between the price under the current system, P^c, and a weighted average of the benchmark prices, where the weights are given by the relative frequencies of high- and low-loss consumers:

$$\Delta AC = P^c - \left(\frac{x_L^*}{x_L^*+x_H^*}\right) P_L - \left(\frac{x_H^*}{x_L^*+x_H^*}\right) P_H , \tag{4}$$

Substituting for P^c from equation (3) and for P_L and P_H from equation (2) yields

$$\Delta AC = \frac{(\beta_H - \beta_L)\ \mu\ (x_L^* - x_H^*)}{2(x_L^* + x_H^*)}. \tag{5}$$

As one would expect, the increment in average accident cost due to adverse selection rises as the difference in the expected losses of the low- and high-loss types, $(\beta_H - \beta_L)\ \mu$, increases. Restated,

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[9]The consumption choices under the current system are independent of whether consumers know their type. Consumers are fully insured; so they simply compare their reservation price to the product price. Thus, relative to the perfect insurance market benchmark, there is an adverse selection of consumers even if consumers are unaware of their risk. This observation contrasts with Bishop (1983, p. 261) who states that adverse selection "can arise only where victims know they are high-risk or high-cost cases." We note, however, that in a setting where consumers do not know their types, all consumers view themselves as average. In this circumstance, the actual selection of consumers would not be viewed as inefficient in light of the information available.

[10]Because of the assumption of identical reservation price schedules for the two types, the tax and subsidy amounts for the actual consumers are equal.

[11]A sufficient condition for an equilibrium with positive quantities purchased by both types to exist is that the expected losses of high-loss consumers, $\beta_H\mu$, is less than the reservation price of the consumer with the highest reservation price, R(0). If $\beta_H\mu$ were sufficiently greater than R(0), then the price would exceed R(0) and the quantity for both types of consumers would be zero.

the greater the heterogeneity in consumer types, the greater the cross subsidy and the more costly the adverse selection, ceteris paribus. The increment in average costs also depends on the price elasticity of the reservation price function, which determines the extent to which the efficient proportions of low- and high-loss consumers differ, i.e., $x_L^* - x_H^*$.[12] In the case of zero elasticity demand, the cross subsidy still exists, but there will be no adverse selection.

2.3. Alternative Compensation Schemes.

We now evaluate schemes where compensation for consumers may diverge from the current system's full compensation. These alternatives may take the following form:

$$C_i = \alpha_i \tilde{Z} , \tag{6}$$

where C_i is the compensation for consumer of type i. Compensation for an accident will differ from the losses suffered if α_i does not equal β_i. Maintaining the assumption that sellers cannot discriminate between high- and low-loss types, the insurance premium (the product price) under the alternative regime equals -- as in the current system -- the average awards to low- and high-loss consumers. This average depends on the parameters of the compensation scheme, α_H and α_L, and the proportion of actual consumers of each type:

$$P^a = \frac{(x_L^a \alpha_L + x_H^a \alpha_H)\ \mu}{x_L^a + x_H^a} , \tag{7}$$

where x_i^a is the marginal consumer of type i under the alternative compensation scheme.

To counteract adverse selection, an alternative compensation scheme (the α_i's) must alter purchase decisions such that the quantities purchased by high- and low-loss consumers approach

[12]For constant elasticity demands, the derivative of ΔAC with respect to demand elasticity is positive, indicating that the increment in average accident costs due to adverse selection increases as the reservation function becomes more elastic. In addition to influencing the amount by which average costs increase, the demand elasticities determine whether total expected accident costs in the product market increase. Intuitively, if changing from the current system to the perfect insurance market produced a small decrease in high-loss consumers relative to the increase in low-loss consumers, then total expected losses under the current system may be less than in the prefect insurance market. This observation suggests caution in using liability insurance premia to evaluate performance of the products liability system and reforms thereof. A complete analysis of total expected accident costs, however, should take into account consumer substitution to other products, which may be more or less risky than the product in question.

those in the perfect insurance market case. To *match* the perfect insurance case, the α_i's must be chosen so that $x_i^a = x_i^*$. What alternative compensation schemes would be effective in counteracting adverse selection? Because the problem is a consequence of the mispricing of the insurance component of the product bundle, it is natural to focus attention on compensation schemes that reduce the mispricing. Since all consumers pay the same price for the insurance, reducing mispricing entails reducing the variance in awards.

To eliminate variance, α_L must equal α_H.[13] Then both low-loss and high-loss consumers who suffer the same accident receive the same compensation. This is a general form for a *damage schedule* where compensation is a function of the accident state but not the victim's characteristics. If, for example, compensation equals the average losses of high- and low-loss consumers who experience the same accident state, i.e., $\alpha_L = \alpha_H = (\beta_L + \beta_H)/2 = \alpha_{ave}$, high-loss victims would be under-compensated by $(\beta_H - \alpha_{ave})\tilde{Z}$ and low-loss victims would be over-compensated by $(\alpha_{ave} - \beta_L)\tilde{Z}$. The case where uniform compensation equals the losses suffered by low-loss victims ($\alpha_H = \alpha_L = \beta_L$) -- a *cap* on damages for a given accident state -- results in under-compensation for high-loss victims alone.

Eliminating variance through a damage schedule eliminates the cross subsidization in the current system that arises from different consumer sensitivities to accident states. All consumers pay the same price for insurance and receive the same coverage. This result does not depend on consumers' awareness of risks nor on their attitudes toward risk. The effects of damage schedules on purchase decisions and adverse selection, however, depend on how consumers evaluate the risks that arise because of the potential divergence between compensation and losses in the event of an accident. Purchase exposes consumers to a gamble, $(\alpha_i - \beta_i)\tilde{Z}$, whose true expected value is $(\alpha_i - \beta_i)\mu$.

In the case of fully informed and risk neutral consumers, purchase decisions will be based on the true expected value of the gamble. In these circumstances, the marginal consumer of type i is defined by the following equation:

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[13]Alternative arrangements would reduce, but not eliminate the variance in awards. For example, α_L could equal β_L (full compensation for low-loss consumers) and $\alpha_H = .8\beta_H$ (a coinsurance arrangement for high-loss consumers).

$$R(x_i^a) = P^a - (\alpha_i - \beta_i)\mu. \quad (8)$$

It can be shown that a necessary and sufficient condition for eliminating adverse selection in this context is to award damages according to a schedule, that is to set $\alpha_L = \alpha_H$.[14] Intuitively, fully informed, risk neutral consumers will adjust the price they are willing to pay for the product by the expected value of the gamble and this adjustment exactly offsets the subsidy they receive or the tax they pay under the current system.

To see more clearly how uniform compensation schemes eliminate adverse selection, consider the case where compensation equals the average losses of high- and low-loss consumers. The effective price for fully informed, risk neutral consumers equals the purchase price, P^a ($= \alpha_{ave}\,\mu$), less the expected value of the gamble, $(\alpha_{ave} - \beta_i)\mu$. Adding the two components, the effective price for each type is $\beta_i\mu$, which matches the perfect insurance market case. Similarly, if compensation is capped at the level of low-loss victims ($\alpha=\beta_L$), the effective price for fully informed high-loss consumers would be the product price ($P^a = \beta_L\mu$) less $(\beta_L - \beta_H)\mu$, which equals the expected losses of high-loss consumers, $\beta_H\mu$. Since low-loss consumers are fully insured, their effective price is the purchase price, $\beta_L\mu$, independent of their attitudes toward risk. Again, the effective prices to both types is the same as in the perfect insurance market case and adverse selection is eliminated.

A consumer's valuation of the gamble, however, may differ from the true expected value because of either misinformation or risk aversion. Regarding the former, consumers may not be fully informed about the possible injuries from using the product (the distribution of $\tilde{Z}$), their type (β_i), or the nature of the compensation scheme (the α_i's). In the extreme, if consumers are completely uninformed about the product risk or believe that the compensation system provides full insurance, their valuation of the gamble equals zero. In these cases, independent of attitudes

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[14]This can be proved formally as follows. From equation (8),

$$R(x_L^a) - R(x_H^a) = (\alpha_H - \alpha_L)\mu + (\beta_L - \beta_H)\mu.$$

If $x_L^a = x_L^*$ and $x_H^a = x_H^*$, then equation (2) and the equation above imply $\alpha_L = \alpha_H$. If $\alpha_L = \alpha_H = \alpha$, then from equation (7), $P^a = \alpha\mu$. This result when substituted into equation (8) implies

$$R(x_L^a) = \beta_L\mu \quad \textit{and} \quad R(x_H^a) = \beta_H\mu.$$

This result and equation (2) imply $x_L^a = x_L^*$, and $x_H^a = x_H^*$.

toward risk, consumers would decide whether to purchase the product by simply comparing their reservation prices to the purchase price. Without the ability to discriminate between the two types, all consumers would be offered the same purchase price, which in turn would lead to an equal proportion of low- and high-loss consumers. Therefore, with completely uninformed consumers or with consumers who always believe they are fully insured, no compensation scheme can mitigate adverse selection.

More generally, the critical element in purchase decisions is the consumer's belief regarding the distribution of the compensation received if injured ($\alpha_i\tilde{Z}$) relative to the losses suffered ($\beta_i\tilde{Z}$). If consumers expect compensation to be less than their losses, then the expected value of the gamble is negative and the level of purchases decreases. If consumers expect to be over-compensated, the opposite is true.

Even though consumers are not likely to have perfect information about the risks they face, use of damage schedules will counteract the adverse selection problem provided consumers are knowledgeable about whether the expected value of the gamble they face is positive or negative. For example, if compensation equals the average of victim's losses, high-loss consumers might know that if injured they would receive only partial compensation and so face a gamble whose expected value is negative. With this type of non-erroneous information, uniform compensation will increase the effective price to high-loss consumers and so reduce their purchases.

Presuming the qualitative results go in the right direction, the quantitative effects of uniform compensation depend on the particular values consumers attach to the gambles they face. When consumers underestimate the absolute values of the gambles they face, e.g., they might believe that the expected value of the gamble is one half of its true value, damage schedules would mitigate, but not eliminate, adverse selection. However, with excessive valuations, there may be overshooting of the optimums defined by the perfect insurance case. High-loss consumers might underestimate their compensation if injured, which would lead to purchases below the perfect insurance level.

Attitudes toward risk may influence purchase decisions whenever consumers view product purchase as exposing themselves to a gamble. In particular, risk aversion will reduce purchases relative to the risk neutral case. Thus, with uniform compensation and fully informed consumers, purchases of low-loss consumers will fall short of the perfect insurance benchmark. For high-loss consumers, the effective product price under uniform compensation will increase by

more than the expected value of the gamble.[15] The combination of uniform compensation and risk aversion would again cause overshooting, meaning consumption by high-loss types will fall below the perfect insurance benchmark. Although risk aversion will cause deviations from efficient purchase decisions, consideration of risk aversion does not alter the qualitative effect of uniform compensation: high risk consumers purchase less and low risk consumers purchase more than under the current system, thus offsetting the distortion induced by adverse selection.[16]

3. Discussion.

Our analysis shows that, if a strict liability rule is to be retained, a damage schedule providing uniform compensation to all victims experiencing the same accident state may be helpful in mitigating adverse selection that arises from different consumer sensitivities to accidents. An improvement of the type we discuss can be expected provided consumers have at least partial knowledge of product risks. Damage schedules would not, however, counteract the adverse selection arising from differences in consumer propensities to suffer accidents. Indeed, the latter source of adverse selection seems difficult to remedy without fundamentally changing the strict liability of producers.

A more complete assessment of damage schedules requires evaluation of issues not considered in the model. These include (1) how does compensation for non-economic losses alter the analysis? (2) what is the effect of damage schedules on legal costs and liability insurance loading fees? and (3) are damage schedules consistent with providing producers and consumers with proper incentives for care?

Non-Economic Losses

The American Law Institute (1991) recently embraced the principle of a damage schedule in the determination of awards for non-economic losses. Specifically, the Institute proposes that judges instruct juries regarding the dollar amount that is typically awarded for victims who suffer

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[15]If high-loss consumers are extremely risk averse, then uniform compensation may "overshoot" the efficient level of consumption by more than the current system increases consumption by high-loss consumers.

[16]Risk bearing also induces welfare losses on risk averse consumers, which when taken into consideration may imply that the current system is more efficient than a uniform compensation system.

a particular injury. The jury would then assign a figure with the guidelines in mind.[17] Our analysis indicates that adoption of this proposal would reduce adverse selection and cross subsidization.[18] In contrast, proposals of the type forwarded by the American College of Trial Lawyers might not be particularly effective in combating these problems. Their proposal would limit awards for non-economic losses to a certain multiple of economic losses. As a result, compensation would vary with and, more important, the implied constraint on awards would depend on victim-specific characteristics such as income. For this reason, our analysis favors the Institute's proposal over the College's proposal.

Compensation for non-economic losses, however, raises the issue that many consumers would not demand insurance against such losses even if provided at actuarially fair prices.[19] Forcing consumers to purchase such insurance increases product prices by more than consumers value the insurance, reducing consumption by both low- and high-loss consumers relative to the efficient consumption levels. Since damage schedules that provide uniform compensation for all losses tend to increase consumption by low-loss consumers, uniform compensation moves low-loss consumers closer to their efficient consumption level. Uniform compensation, however, tends to reduce consumption by high-loss consumers which may exacerbate the inefficiency caused by forcing these consumers to purchase insurance against non-economic losses.

Legal Costs and Liability Insurance Loading Fees

In addition to counteracting adverse selection and cross subsidization, a damage schedule would reduce costly haggling over the dollar compensation in products liability cases. Models of litigation also indicate that parties are more likely to litigate when each is relatively optimistic about the trial outcome.[20] Thus, damage schedules would reduce the potential divergence of views concerning the potential award and therefore may reduce the number of cases that are

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[17]New Zealand uses a schedule to determine awards for non-economic damages. See Miller (1989).

[18]Evidence from Viscusi (1988) indicates that awards for pain and suffering correlate positively with the victim's economic losses.

[19]See Viscussi (1990) for a recent discussion of these issues along with some empirical evidence. Compensation for non-economic losses, however, may serve a deterrence function. The conflict between deterrence and compensation may justify a decoupling of fines and awards [see Spence (1977) and Danzon (1984)].

[20]For a review of these models, see Cooter and Rubinfeld (1989).

actually litigated. Since legal expenses represent over 40 percent of the total insurance premiums for product liability,[21] a schedule providing uniform compensation for various injuries might yield a significant savings in legal costs.[22] Reduced uncertainty over compensation in product liability cases may also reduce the costs of providing liability insurance for producers even if the damage schedule does not reduce the expected award.[23]

A potentially important consequence of reducing legal costs and liability insurance loading fees is a reduced likelihood that adverse selection will cause product markets to unravel or products to be withdrawn. Ceteris paribus, lower legal costs and liability insurance loading fees reduce the product price, and therefore increase the likelihood that there will be some consumers willing to pay the cost of supplying the product.

Incentive Issues

Are compensation schemes that reduce the variance in awards consistent with the deterrence goal of the products liability system? Regarding producer incentives to make safe products, the answer is a qualified yes. Setting awards equal to average losses would approximate the incentives created under the current system. For example, accident victims who miss one year of work would receive compensation equal to the average yearly wage income of all potential accident victims. Under such a scheme, producers would bear the total cost of unsafe products.[24]

If uniform compensation is set equal to the damages suffered by low-loss types -- similar to a cap on compensation, then producers would have less incentive to make safe products (ignoring the potential equilibrating mechanisms such as reputation effects and regulation) than under the current system. In principle, incentives could be strengthened by assessing fines, e.g., equal to the difference between the average loss of all consumers and the compensation

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[21]See Kakalik and Pace (1986).

[22]Danzon (1984) discusses these benefits. We note that uniform compensation would not be equivalent to a no-fault system since compensation would only be provided upon proving that the injury was caused by use of a particular product.

[23]See Doherty (1991) for a model in which insurance prices depend on the variability of underwriting losses.

[24]See Danzon (1984) for a discussion of optimal incentives to invest in loss prevention. In discussing the merits of individualized awards versus use of benefits schedules, Danzon also notes that by adding variance, individualizing awards could lead to greater deterrence by risk averse producers.

consumers actually receive.[25] With this decoupling of total liability and victim compensation, producers could bear the full social costs of their actions, yet the problems of cross subsidization and adverse selection would be reduced. Uniform compensation schemes, therefore, can duplicate the incentives under the current system.

There is also the issue of consumer incentives for care. In general, consumers may influence the probability of an accident and the losses conditional on an accident. As is well understood, compensation schemes may distort consumer behavior in both dimensions.[26] If uniform compensation exceeded actual losses for some consumers -- a likely outcome, then these consumers would have weaker incentives to avoid losses than they would under the current system. On the other hand, undercompensation for high-loss consumers would act like coinsurance and so increase their level of care. Thus, the optimal level of uniform compensation would depend on the importance of moral hazard on the part of consumers; when coinsurance would reduce substantially expected losses, uniform compensation at a relatively low level would be more advantageous.

In considering the possible inefficiencies from moral hazard, we note that the conditions under which damage schedules may cause moral hazard are also the conditions under which such compensation schemes would counteract adverse selection. When consumers are aware that the compensation system can overcompensate them for accident losses, then moral hazard is likely to be significant. But awareness of the compensation system is also necessary for uniform compensation to mitigate adverse selection.

4. Conclusion.

The current assignment of strict liability for product risks affects consumption choices because of the substantial transactions costs of offering consumer-specific prices that reflect differences in the cost of insurance. The most obvious private remedy to the adverse selection problem would be to allow consumers to decline the products liability protection, which would

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[25]In light of the sometimes conflicting objectives of the liability system, it is not surprising that decoupling (permitting awards to victims to differ from the amount paid by the seller) may enhance efficiency. This idea is discussed in Spence (1977). For a discussion of decoupling in another context, see Polinsky (1986).

[26]Of course, the current products liability system is, in the view of many, fundamentally flawed because the reliance on strict liability rules. Nevertheless, it is appropriate to evaluate whether, by imposing risks on most consumers, uniform compensation might further distort consumer behavior. A limitation to the analysis in Section 2 is that these moral hazard issues were not addressed.

lead lower loss types to self-select out of the insurance contract. This remedy, however, is prohibited by law. An alternative approach is for producers to separate consumer risk types through product differentiation or market segmentation [Priest (1987)]. These tactics are costly, however, and in many cases ineffective. As noted earlier, the privity limitation on claims no longer applies, which eliminates a potential barrier to resale. As a result, when there is substantial variation in consumer attributes, it is unlikely that private remedies will reduce significantly the adverse selection and cross subsidization problems.

Our analysis indicates that damage schedules that provide uniform compensation to all victims in the same accident state counteract one form of adverse selection, provided consumers are at least partially informed about product risks. With appropriately designed damage schedules, consumers bear the risks associated with their different sensitivities to accident states, the individual-specific component of product risk, while producers are liable for the non-specific component. This assignment of liability negates the problem of implementing consumer-specific contracts,[27] and thereby, subject to qualifications about consumer awareness of product risk, moves consumption choices toward those that would be expected in the absence of transaction costs.[28]

Our discussion also highlights other effects of uniform compensation schemes. Uniform compensation is likely to reduce transaction costs and reduce uncertainty concerning liability awards, which may limit remaining adverse selection problems. In addition, uniform compensation reduces cross subsidization inherent in the current system. On the other hand, uniform compensation may adversely influence consumer incentives to exercise care in using products and imposes risk on some consumers. Moreover, because such schemes entail overcompensation and undercompensation, they may be viewed as objectionable from an ex-post fairness perspective -- even though they eliminate the ex-ante cross subsidization. These concerns are typically outside the realm of economic analysis, but are clearly relevant to public policy formulation and implementation, and may raise constitutional issues of due process and equal protection.

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[27]There is still the possibility of higher-loss consumers contracting with first-party insurers for their uninsured risk. In this sense, uniform compensation might be viewed as an efficient default rule which would prompt some consumers to contract, not with the producer, but with a lower-cost insurer.

[28]This result is consistent with Demsetz (1972) who discusses when the assignment of liability affects the allocation of resources.

In light of the concerns with uniform compensation schemes, the case for reform of this type depends on the magnitude of the adverse selection and cross subsidization problems associated with victim-specific compensation. Where adverse selection problems persist notwithstanding private remedies, their severity depends on characteristics of the product market. An argument can be made that, as a rule, the product liability system has minimal influence on purchase decisions because the insurance component of prices is small. And when it is not small, demand elasticity may be so low that there is little variation in purchase decisions. On the other hand, a sound case might be made for use of damage schedules if producers of computers, tobacco, or alcohol become liable for product risks. Much of the support for such schemes probably would derive from the potential savings in administrative costs and fairness concerns. The latter are of course intimately tied to the issue of cross subsidization. Our analysis indicates, though, that early reliance on damage schedules would generate efficiencies by reducing adverse selection. Indeed, the conditions that cause adverse selection problems exist with these products. The potential liability costs would constitute a relatively large proportion of the product price, demand is far from inelastic, and, because the products have wide-spread appeal, consumers are heterogeneous.

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