Punitive Damage Effects on Post-Loss Bargaining and Settlement

Neil Doherty[1]
David Eckles[2]

[1]Ronald A. Rosenfeld Professor of Insurance and Risk Management, University of Pennsylvania
Office: (215) 898-7652
Fax (215) 898-0310
Email: **doherty@wharton.upenn.edu**
Address: 3641 Locust Walk
Philadelphia, PA 19104

[2]Doctoral Candidate, University of Pennsylvania
Office: (215) 898-3589
Fax: (215) 898-0310
Email: **deckles@wharton.upenn.edu**
Address: 3641 Locust Walk
Philadelphia, PA 19104

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Abstract

We examine the theoretical effects of punitive damages and how they affect pre-trial bargaining of insurers and insureds. We also seek to determine how the introduction of symmetric punitive damage awards could affect the bargaining, and by extension, the entire litigation process. We find that asymmetric punitive damage awards do tend to increase the bargaining power of insureds and by allowing for a symmetric system the bargaining power of insureds and insurers are more balanced. We also find that altering the mechanisms for court cost payments also can alter the probability of out of court settlements.

Introduction

After an occurrence of an insured loss, the insured and insurer may engage in post-loss bargaining over the claim amount. Many factors enter into the decision process of the insured and insurer. The insured considers potential consequences relating to rating standards, i.e. increased premiums, as well as the true value of the loss. In addition to the true value of the loss, the insurer also considers factors such as the goodwill created by bargaining in good faith, settling the claim quickly, etc. The possibility of obtaining a remedy within the court system certainly enters into both the insured and insurer's decision process. The insured knows that he can always sue if the insurer's proposed settlement is unacceptable, while the insurer knows that the insured knows of this remedy. Not only is there a possibility of the insured obtaining the fair value of the loss from a court award (compensatory damages) but there also exists the possibility of the insured being given a punitive damage award if the court deems that the insurer did not bargain in good faith. Again, the insurer is aware of the potential of these awards and will be less inclined to bargain in bad faith after a loss.

There is a debate on out of court settlements in the legal literature regarding the importance of punitive damages. Those who claim punitive damages to be insignificant cite the low frequency of punitive damage verdicts, the finding of relative predictability of awards, as well as the extensive post-verdict legal review (Koenig (1998)) as potential reasons for the irrelevance of punitive damages with respect to the bargaining process. Even if it is true that punitive damages are insignificant with respect to trial verdicts, does that necessarily mean that they are an insignificant part of the legal system? More precisely, does the rarity and/or predictability of actual punitive damage awards handed down in court cases imply there is no impact of punitive damages on the settlement process? Polinksy 1997 gives a very simple example of this situation and concludes that "[i]t would be a mistake to conclude that because punitive damages are not a significant factor in cases that go to trial, they also are not a significant factor in the settlement process." This is the motivation for this study. "Threats" of punitive damages loom over the bargaining process, and both parties to litigation do, in fact, bargain in the "shadow" of punitive damages.

It is important to note that because our model is couched around an insurance setting, it need not be the case that an insured and insurer are the "main characters." Other contractual disputes can be analyzed in the model we present below. However, there may be some added benefit to using an insurance motivation. A closed claim study by the Texas Department of Insurance (Koenig (1998)) shows that between 1990 and 1993 an average of 10.6% of closed claims in the state of Texas were affected by the threat of punitive damages. Additionally, the average dollar amount of the punitive damage component was $126,190. [Texas requires claims adjusters to separate the claims paid into four categories, one of which includes a punitive damage component. It is fair to be somewhat skeptical of the numbers reported above, as they do rely solely on an adjuster's view of a particular claim. Even so, one would be hard pressed to completely disbelieve the study, and we can therefore grant at least a modicum of truth to the figures.] Further, most states have legislation in place that will allow exemplary awards in either third party bad faith claims or first party bad faith claims. The Institute for Civil Justice (ICJ) also found evidence in, among other states, California where one large punitive damage case (*Royal Globe v . Superior Court*) set precedent for legislation allowing punitive damages in third party bad faith claims. The ICJ study also found that allowing for punitive damages did increase the amount of claims, and claimant behavior, in California. As a result of the California and Texas experience, there does appear to be at least some extra justification for considering our model in an insurance environment.

Our current legal system is not symmetric. Insurers cannot (or do not) sue when they perceive the insured has not acted in good faith. Although, if criminal prosecution of fraudulent claims are considered, the legal system can be viewed as symmetric. We will further discuss this issue as we develop the model. Absent this criminal prosecution, the insurer's only remedy is to not pay out the claim, or drag the process out. This should result in proposed settlement amounts that tend in favor of the insured, then insureds and insurers engage in post-loss bargaining. We are also interested in determining what would occur if both parties had symmetric bargaining power.

We first develop a theoretical model that analyzes the effect of the status quo asymmetric legal system and liability rules. Insurers, or more generally, those who are subject to having punitive damage awards levied against them, will bargain in a different manner than those parties (i.e. insureds) that are not subject to such fines. Specifically, when faced with potential punitive damage awards, insurers will offer settlements that are closer to the actual value of the loss in order to avoid going to court and incurring the potential of a punitive damage award. This model indicates that insureds, however, do seem to have an incentive to bargain in bad faith. This is shown by the fact that their demand is higher than the insurer's offer and can sometimes be above the fair value of the loss. In these cases, the insured is using the possibility of punitive damages as a threat to leverage against the insurer.

Our model also examines other issues. First, we study the circumstances that must exist for there to be agreement between the two parties, or, when a settlement would occur outside of the courts. Second, we show that in the absence of this asymmetric legal system where both the insured and insurer can be held liable for punitive damages, both parties would have an incentive to reach a settlement and keep the matter out of the courts.

Given the descriptive framework first, then we identify potential problems with the pricing of insurance contracts. We find that insureds can extract settlements from insurers that are higher than their actual loss. This finding can be interpreted as an inefficiency in insurance markets. If insureds are indeed obtaining inefficient settlements, then they are also undoubtedly paying for the inefficiency in the forms of higher premiums and/or lack of insurance supply. The insurance market therefore is incomplete and some parties are priced out of the market. Those insureds that obtain coverage are also faced with a problem in that there is inadequate traditional risk sharing. The insurance contract does not simply price the value of the pure risk involved, but rather must also include the "price" of the inefficiency of the asymmetric punitive damage awards.

Our second model examines the potential for reducing this inefficiency by introducing symmetric punitive damage awards. We seek to determine if we can alter the current system and design punitive damage awards such that the insurance market is both more complete and insurance products can more accurately reflect proper risk sharing. Introducing these symmetric awards may induce reduced prices for insurance. This would reduce the dual inefficiency incurred under the current system, with fewer people insured and higher prices for those that are insured.

Previous Literature

Most of the theoretical literature on punitive damage awards considers product liability issues. Boyd and Ingberman (1999), Daughety and Reinganum (1997, 1998), Karpoff and Lott (1999), and Feldman and Frost (1998) all explore how the existence of punitive damages affects product safety. These works consider models where the courts act as an enforcer and punitive damage judgments are enforcement mechanisms. A limitation of this literature is, however, that these papers do not consider settlement as a possibility. That is, there is no pre-trial bargaining.

Additionally, there is a critical difference between the punitive damage literature in the products liability and what we discuss here. As mentioned above, punitive damages are used in the products liability area in an effort to promote product safety. With products liability cases, the defendant is the cause of the harm, or loss, to the plaintiff. As such, punitive damages are shown to be a true punishment mechanism that attempts to reduce the harm on the plaintiff. In this paper, the plaintiff (insured) will be assumed to have suffered a loss outside the control of the defendant (insurer). Therefore, there is no safety expenditures insurers can undertake to reduce the potential harm to the insured.

There is quite a large literature on pretrial bargaining, Cooter and Rubinfeld (1989) give a nice literature review on earlier papers, while later papers in the area include, Koenig (1998), Polinsky and Shavell (1998), P'ng (1983), Bebchuk (1984), and Reinganum and Wilde (1986), to name a few. Many of these papers introduce models similar to the one we describe below. More recently, Shavell (1999) analyzes the social cost of litigation. He includes the possibility of settlement, but he is more concerned with deriving the appropriate costs to deter (encourage) excessive (insufficient) levels of litigation. He also explores the appropriate amount of care that should be taken by "injurers." Like most of the literature, he also does not explicitly consider punitive damages.

Reinganum and Wilde (1986) may be the model closest to ours in concept. However, they only allow the plaintiff to make an offer. They also have differing information structures between the litigants. The plaintiff is assumed to know the true level of damages sustained. The defendant then has to use the plaintiff's offer as a signal of the actual damages. We assume that the true value of the loss is exogenously given and is known by all parties. The defendant's strategy is then based on the probability of its acceptance of the plaintiff's offer. We allow for the defendant to both make its own offer, as well as potentially accept the plaintiff's offer. Reinganum and Wilde do allow for court awarded damages to be above compensatory damages, there is no explicit consideration of punitive damage awards. That is, there is some damage multiplier but there is no modeling of the situations where the multiplier is greater than one. There is an exogenously given probability of the court awarding in favor of the plaintiff, but there is no separate probability of being awarded a punitive award. We explicitly model this relationship. Reinganum and Wilde also examine a variety of court cost mechanisms (American Rule, English Rule, and two hybrid systems), which we also do.

Model

Assume a risk neutral agent has obtained an insurance policy from an insurer. During the life of the contract, the policyholder can either incur a) an insured loss, b) an uninsured loss, c) or no loss. For now, we will assume that an insured loss, L, happens with probability one. Under our model, it is assumed that both the insured and insurer know the nature of the loss simultaneously. The insurer and insured then make simultaneous settlement offers of θ and β, respectively. Now, let $\pi^a(\theta)$ be the probability that the policyholder accepts the insurer's offer, where $\pi_\theta{}^a(\theta) > 0$ and $\pi_{\theta\theta}{}^a(\theta) > 0$ where $\pi_\theta{}^a(\theta)$ and $\pi_{\theta\theta}{}^a(\theta)$ are the first and second derivatives of $\pi^a(\theta)$ with respect to θ. Similarly, let $\pi^a(\beta)$ be the probability that the insurer accepts the policyholder's demand, where $\pi_\beta{}^a(\beta) < 0$ and $\pi \pi_{\beta\beta}{}^a(\beta) < 0$, where $\pi_\beta{}^a(\beta)$ and $\pi_{\beta\beta}{}^a(\beta)$ are the first and second derivatives of $\pi^a(\beta)$ with respect to β. If a settlement is not reached, that is, $\theta < \beta$, both parties head to court. Notice, $\pi^a(i), i \in [\theta, \beta]$ are ex-ante beliefs that the settlement offer is accepted. Ex-post, we know whether or not $\theta < \beta$, and therefore know with probability one whether or not a settlement occurs. Now, let $1 - \pi_{PH}$ be the probability that the policyholder wins a court case, according to policyholder beliefs, and let π_{IR} be the probability that the insurer wins a court case, according to insurer beliefs. If the insured wins the court case, he will receive compensatory damages of L. If the insurer wins the case, he only does not have to pay the claim, so, he "wins" no compensatory damages. The insurer and insured will incur costs related to litigation of C_I and C_P, respectively. In addition to compensatory damages, we will offer punitive damages as a punishment for not bargaining in good faith. Let P be the amount of punitive damages, and $\pi^P(\theta)$ be probability that punitive damages are awarded against the insurer, where $\pi_\theta{}^P(\theta) < 0$ and $\pi_{\theta\theta}{}^P(\theta) > 0$. Similarly, let $\pi^P(\beta)$ be the probability that punitive damages are awarded against the policyholder where $\pi_\beta{}^P(\beta) > 0$ and $\pi_{\beta\beta}{}^P(\beta) < 0$. Notice, we are modeling these probabilities of having to pay punitive damages as conditional on the settlement offer. The literature until now has ignored symmetric punitive damage awards. We will start our model with the traditional analysis where one-sided punitive damages persist, i.e. $\pi^P(\beta) = 0$. We will then expand the model to include possible punitive damage awards for both parties.

Asymmetric Punitive Damage Awards

Assume, there are asymmetric punitive damage awards: that is, only the policyholder can be awarded punitive damages. The insurer's expected costs are then:

$$\theta\pi^a(\theta) + \left(1-\pi^a(\theta)\right)\left[\left(1-\pi_{IR}\right)\left(L+P\pi^P(\theta)\right)+C_I\right] \tag{1}$$

Therefore, the insurer will choose θ to minimize (1):

$$\min_{\theta} \theta\pi^a(\theta) + \left(1-\pi^a(\theta)\right)\left[\left(1-\pi_{IR}\right)\left(L+P\pi^P(\theta)\right)+C_I\right] \tag{2}$$

The FOC of (2) is:

$$\begin{aligned}&\pi^a(\theta)+\theta\pi_\theta{}^a(\theta)+\left(1-\pi_{IR}\right)P\pi_\theta^P(\theta)-\pi^a(\theta)\left[\left(1-\pi_{IR}\right)\left(L+P\pi^P(\theta)\right)+C_I\right]\\&-\pi_\theta{}^a(\theta)\left(1-\pi_{IR}\right)\left[P\pi_\theta^P(\theta)\right]=0\end{aligned} \tag{3}$$

Rearranging (3), we obtain

$$\theta^* = \left\{(1-\pi_{IR})L\right\} + \left\{C_I\right\} + \left\{(1-\pi_{IR})P\pi^P\left(\theta^*\right)\right\}$$
$$-\left\{\frac{1-\pi^a\left(\theta^*\right)}{\pi_\theta^a\left(\theta^*\right)}P\pi_\theta^P\left(\theta^*\right)(1-\pi_{IR})\right\} - \left\{\frac{\pi^a\left(\theta^*\right)}{\pi_\theta^a\left(\theta^*\right)}\right\} \tag{4}$$

So, we claim this θ^* is the optimal offer an insurer should give to the policyholder. What we can see is that the insurer does apparently have an incentive to bargain in good faith.

Definition (Good Faith Definition 1): A good faith offer (demand) is defined as an offer by the insurer (insured) equal to or greater than (equal to or less than) the expected compensatory outcome of the court proceedings.

Definition (Bad Faith Definition 1): A bad faith offer (demand) is defined as an offer (demand) by the insurer (insured) less than (greater than) the expected compensatory outcome of the court proceedings.

In the literature (Sykes, 1996), bad faith is typically considered to be the denial of meritorious claims. That is, the label bad faith is put on the insurer ex-post, and it requires a higher authority (judge, jury) to determine that a meritorious claim was denied. To our knowledge, there has been no attempt to determine whether or not an offer (other than making an offer of “no settlement”) from an insurer is in good or bad faith. Essentially, we will use the term "good faith" to imply that one party is offering a settlement at or above his expected compensatory loss (later we will explore alternate definitions of good faith). Therefore a "good faith" offer from the insurer would be

$(1-\pi_{IR})L$. The first bracketed term of (4) is the expected compensatory court outcome for the insurer, and is in fact the "good faith" offer. Whether or not the final offer is higher than this good faith offer will depend on the remaining bracketed terms. The second term is the court cost and is positive. The third term is the expected punitive damage award and is also positive. Both of these terms serve to increase the insurer's offer. The fourth bracketed term is what we will call the marginal effect of a change in theta on punitive damages. As the insurer's offer increases, the probability of punitive damages goes down. As such, this term is negative, but, because of the minus sign, has a positive impact on the insurer's offer. So it too increases the insurer's offer. However, the final term has a negative effect on the insurer's offer. The magnitude of $\frac{\pi^a(\theta^*)}{\pi_\theta{}^a(\theta^*)}$ determines the extent to which the insurer will bargain in bad faith. $\frac{\pi^a(\theta^*)}{\pi_\theta{}^a(\theta^*)}$ is the inverse of the derivative of $\log \pi^a(\theta^*)$ and is related to the belief the insurer has about the possibility of the insured accepting his initial offer (Holmstrom (1979)). In fact, a higher value of $\frac{\pi^a(\theta^*)}{\pi_\theta{}^a(\theta^*)}$ implies that the insurer has a higher belief that the insured will accept the offer. If the insurer believes his offer will be taken, he will obviously want to reduce the amount of his offer. If this bargaining effect dominates the marginal effect of the offer on punitive damages, then the offer will be "unfair." If the reverse is true, the offer is higher than the good faith offer. The bargaining effect will dominate if:

$$C_I + \frac{P(1-\pi_{IR})\left[\pi_\theta^a(\theta)\pi^P(\theta) - \pi_\theta^P(\theta)\right]}{1 - P\pi_\theta^P(\theta)(1-\pi_{IR})} > \pi^a(\theta) \tag{5}$$

Since $\pi_\theta^P(\theta) < 0$, the left hand side of (5) is always greater than zero. However, it is not immediately clear that this will always be less than one. In fact, the left hand side of (5) is only less than one if $P(1-\pi_{IR})\pi_\theta^a(\theta)\pi^P(\theta) > 1$, which it will almost certainly be (at the very least, the level of punitive damages can be set to $P > \dfrac{1}{(1-\pi_{IR})\pi_\theta^a(\theta)\pi^P(\theta)}$ to guarantee its existence). Therefore there is parameter space, $\pi^a(\theta) \in \left[0, \dfrac{P(1-\pi_{IR})\left[\pi_\theta^a(\theta)\pi^P(\theta) - \pi_\theta^P(\theta)\right]}{1-P\pi_\theta^P(\theta)(1-\pi_{IR})}\right)$ where

$$\theta^* < (1-\pi_{IR})L + C_I \tag{6}$$

implying the insurer is bargaining in bad faith, and parameter space, $\pi^a(\theta^*) \in \left(\dfrac{P(1-\pi_{IR})\left[\pi_\theta^a(\theta)\pi^P(\theta) - \pi_\theta^P(\theta)\right]}{1-P\pi_\theta^P(\theta)(1-\pi_{IR})}, 1\right]$ where

$$\theta^* > (1-\pi_{IR})L + C_I \tag{7}$$

implying the insurer pays more than the "good faith" offer. This results in an interesting case. As the probability of the policyholder accepting an offer, $\pi^a(\theta)$ rises, the insurer wants to make a larger offer! This result can be thought of as an effort by the insurance company to preempt a lawsuit by making a higher offer. It can also be easily seen that as the probability of the insurer winning the case increases, i.e. π_{IR} increases, the amount of the insurers offer goes down. This is obviously a result of the insurer having more bargaining power.

Now, if we let P=0, that is, there are no punitive damages, then (4) becomes:

$$\theta^* = (1-\pi_{IR})L + C_I - \frac{\pi^a(\theta^*)}{\pi_\theta{}^a(\theta^*)} \quad (8)$$

The first two terms of (8) are the same from the general case. In this case, the amount offered to the policyholder is still the expected value of the judgment, plus court costs, minus the adjustment factor for the insurer's bargaining power.

Plotting (4) and(8), we can get a graphical idea of how these two functions operate.

Figure 1

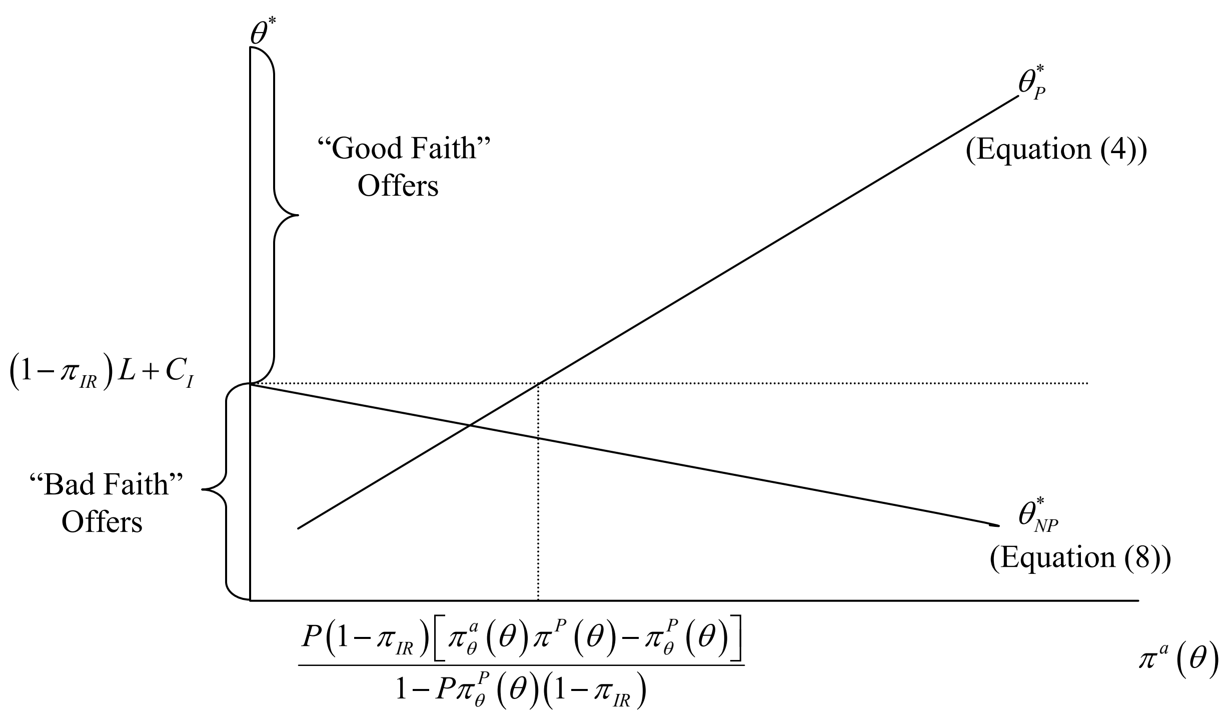


Figure 1 illustrates the important characteristics of the two optimal offers. First, when punitive damages are set to zero, the insured's offer (illustrated by θ^*_{NP}) is *never* above the "fair offer line." As such, in the absence of punitive damages, the insurer will never bargain in good faith. However, when allowing for punitive damages, the optimal offer (θ^*_P) does go into the "good faith" area.

We now want to consider what the policyholder will demand. In our set up, the policyholder's expected payment is:

$$\beta\pi^a(\beta)+\left(1-\pi^a(\beta)\right)\left[\left(1-\pi_{PH}\right)\left(L+P\pi^P(\theta)\right)-C_P\right] \tag{9}$$

The policyholder wishes to maximize (9) and therefore has the following program:

$$\max_{\beta}\ \beta\pi^a(\beta)+\left(1-\pi^a(\beta)\right)\left[\left(1-\pi_{PH}\right)\left(L+P\pi^P(\theta)\right)-C_P\right] \tag{10}$$

The FOC is given as:

$$\pi^a(\beta)+\beta\pi^a_\beta(\beta)-\pi^a_\beta(\beta)\left[\left(1-\pi_{PH}\right)\left(L+P\pi^P(\theta)\right)-C_P\right]=0 \tag{11}$$

Rearranging, we can solve for β:

$$\beta^* = (1-\pi_{PH})\left(L + P\pi^P(\theta)\right) - C_P - \frac{\pi^a(\beta^*)}{\pi_\beta{}^a(\beta^*)} \tag{12}$$

Since $\pi_\beta^a(\beta) < 0$, the policyholder will always make a demand that exceeds his expected gain from going to court. The insured clearly uses the shadow of punitive damages to obtain additional rents from the insurer. As in the case of the insurer's offer, as the insured grows more confident that the insurer will accept his settlement demand, the insured will increase his demand more. That is, if the insured knows he can extract rents, he will do so as much as he can. This behavior comes from the $\frac{\pi^a(\beta^*)}{\pi_\beta{}^a(\beta^*)}$ term. Thus, the lack of symmetric punitive damage awards gives the policyholder a powerful incentive to bargain in bad faith and require more than the expected value of the court result of the compensatory loss. If we remove punitive damages, the policyholder will ask for:

$$\beta^* = (1-\pi_{PH})L - C_P - \frac{\pi^a(\beta^*)}{\pi_\beta^a(\beta^*)} \tag{13}$$

The policyholder will still bargain in bad faith and will ask for more than his expected value of the court judgment (net of costs). However, his demand is substantially reduced because of the non-existence of punitive damage awards. The amount asked for above and beyond expected court winnings is $\frac{\pi^a\left(\beta^*\right)}{\pi^a_\beta\left(\beta^*\right)}$. This term is again the rent extraction behavior we see in both the insured and insurer.

Figure 2

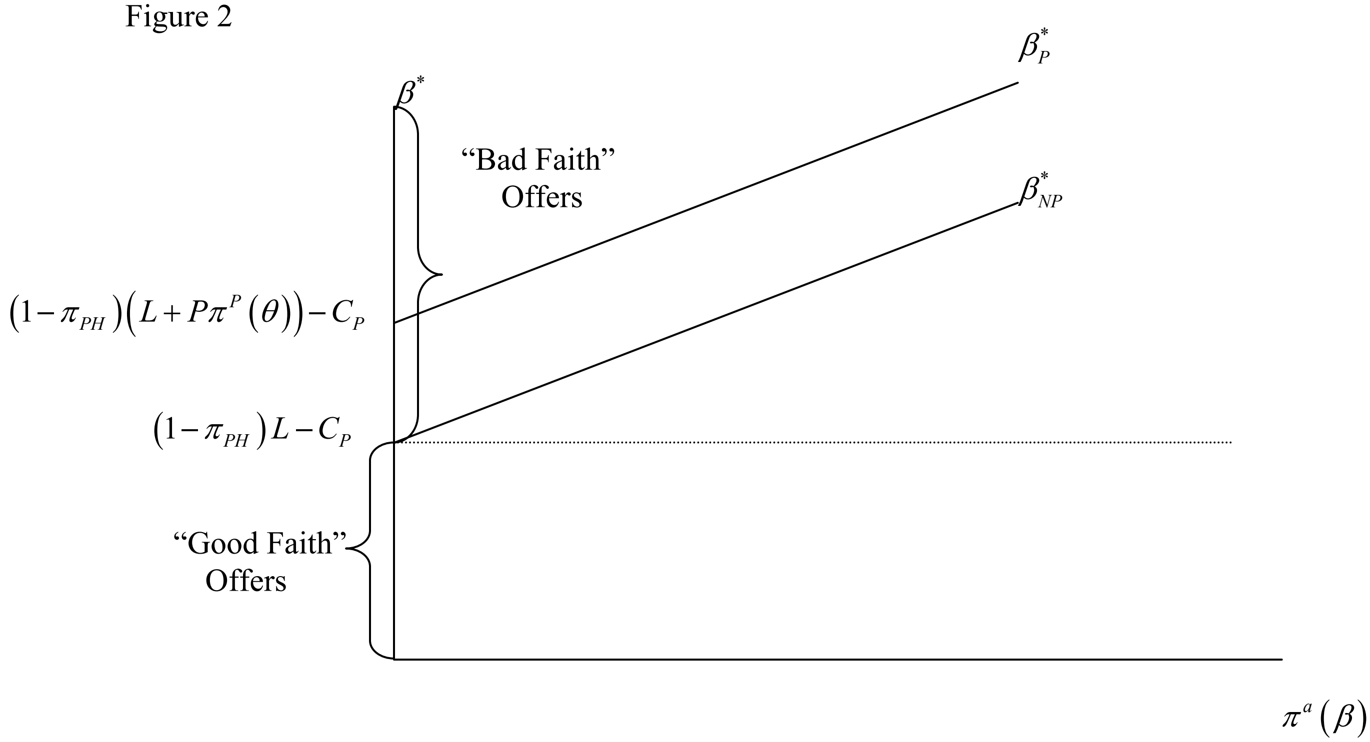


Figure 2 shows how the optimal demands for the insured look graphically. Notice that there is *no* time in which the insured makes a "good faith" offer to the insurer. We will now explore how settlements will take place.

Given that we know the optimal offers both sides will put forth, we can determine when a settlement will occur. That is, if $\theta^*>\beta^*$, the insurer's offer exceeds the policyholder's demand, and the policyholder will accept. Incidentally, why wouldn't the insurer simply offer β^* in the case where $\theta^*>\beta^*$? The answer lies in the asymmetry of the beliefs regarding the probability of success of both the bluffs and the court cases. These probabilities are private information and the other parties are not privy to this information. So, when is $\theta^*>\beta^*$? Rearranging (4) and (12) we observe that $\theta^*>\beta^*$ when:

$$C_I + C_P > \left(L + P\pi^P\left(\theta^*\right)\right)\left[\pi_{IR} - \pi_{PH}\right] + \frac{P\pi_\theta^P\left(\theta^*\right)\left(1-\pi_{IR}\right)\left(1-\pi^a\left(\theta^*\right)\right)}{\pi_\theta^a\left(\theta^*\right)} - \frac{\pi^a\left(\beta^*\right)}{\pi_\beta^a\left(\beta^*\right)} \quad (14)$$

Graphically, the settlement region is the vertically shaded region show in Figure 3 below.

Figure 3

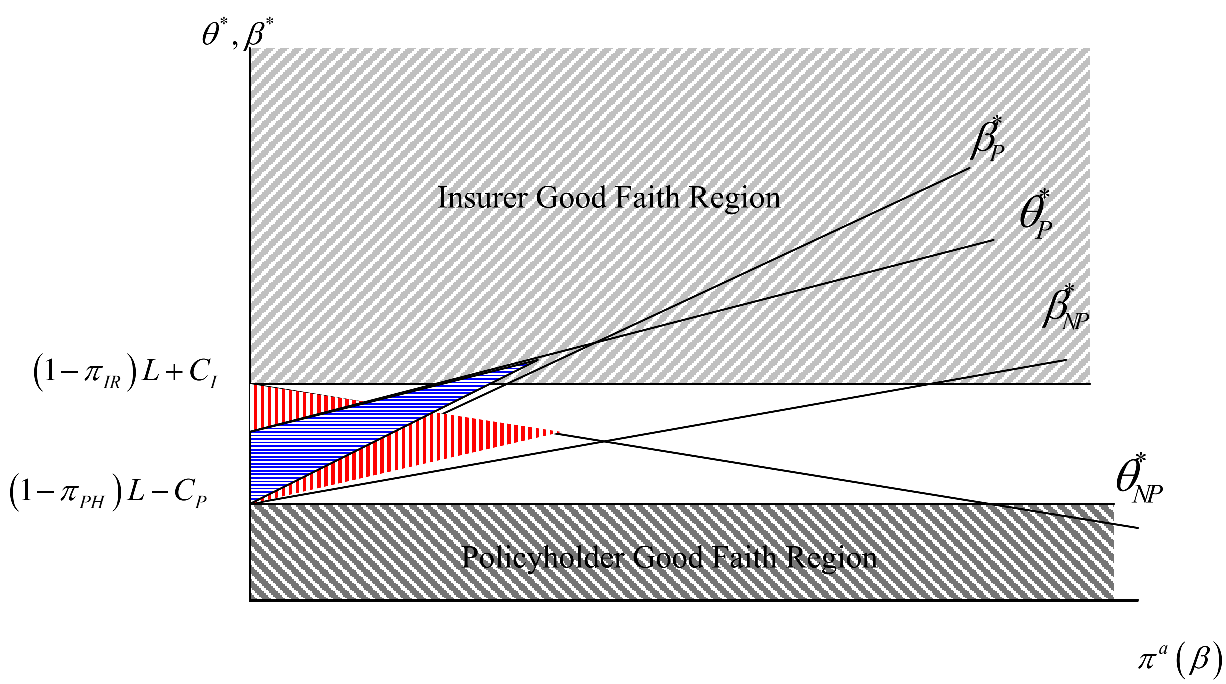


Figure 3 shows some important results of the asymmetric bargaining result. First, settlements *never* occur within the policyholders "good faith region." Second, settlements can sometimes occur outside of the good faith regions of both parties. This can occur with or without punitive damages. Notice, however, that there are only settlements outside of the good faith regions in the case of no punitive damages. Both parties are bargaining in bad faith, but a settlement occurs anyway. Finally, there can also be settlements when the policyholder is bargaining in bad faith and the insurer in good faith (with offer functions β_P^* and θ_P^*).

Given that we know when settlements occur, we can actually solve for the minimum *P* that must be implemented in order to encourage (guarantee) an out of court settlement, using equation (14).

$$P_A^* = \frac{C_I + C_P + \dfrac{\pi^a\left(\beta^*\right)}{\pi_\beta^a\left(\beta^*\right)} - \dfrac{\pi^a\left(\theta^*\right)}{\pi_\theta^a\left(\theta^*\right)} - L\left(\pi_{IR} - \pi_{PH}\right)}{\pi^P\left(\theta^*\right)\left(\pi_{IR} - \pi_{PH}\right) + \dfrac{\pi^P\left(\theta^*\right)\pi_\theta^P\left(\theta^*\right)\left(1-\pi_{IR}\right)\left(1-\pi^a\left(\theta^*\right)\right)}{\pi_\theta^a\left(\theta^*\right)}} \qquad (15)$$

So, lets assume for now that each party has symmetric beliefs regarding the outcome of the court case. That is, assume both the policyholder and insurer believe they will be victorious with probability equal to a half. Then (14) becomes:

$$C_I + C_P > \frac{.5P\pi_\theta^P\left(\theta^*\right)\left(1-\pi^a\left(\theta^*\right)\right) + \pi^a\left(\theta^*\right)}{\pi_\theta^a\left(\theta^*\right)} - \frac{\pi^a\left(\beta^*\right)}{\pi_\beta^a\left(\beta^*\right)} \qquad (16)$$

Then (15) is:

$$P = 2 * \frac{C_I + C_P + \dfrac{\pi^a\left(\beta^*\right)}{\pi^a_\beta\left(\beta^*\right)} - \dfrac{\pi^a\left(\theta^*\right)}{\pi^a_\theta\left(\theta^*\right)}}{\dfrac{\pi^P\left(\theta^*\right)}{\pi^a_\theta\left(\theta^*\right)} \pi^P_\theta\left(\theta^*\right)\left(1-\pi_{IR}\right)} \tag{17}$$

The denominator of (17) is negative. $\dfrac{\pi^a\left(\beta^*\right)}{\pi^a_\beta\left(\beta^*\right)}$ is also negative, implying that

$$\left|\frac{\pi^a\left(\beta^*\right)}{\pi^a_\beta\left(\beta^*\right)} + \frac{\pi^a\left(\theta^*\right)}{\pi^a_\beta\left(\theta^*\right)}\right| > C_I + C_P \tag{18}$$

in order for $P^*>0$.

Lets, for now, further assume that there are no punitive damage awards. (16) then becomes:

$$C_I + C_P > \frac{\pi^a\left(\theta^*\right)}{\pi^a_\theta\left(\theta^*\right)} - \frac{\pi^a\left(\beta^*\right)}{\pi^a_\beta\left(\beta^*\right)} \tag{19}$$

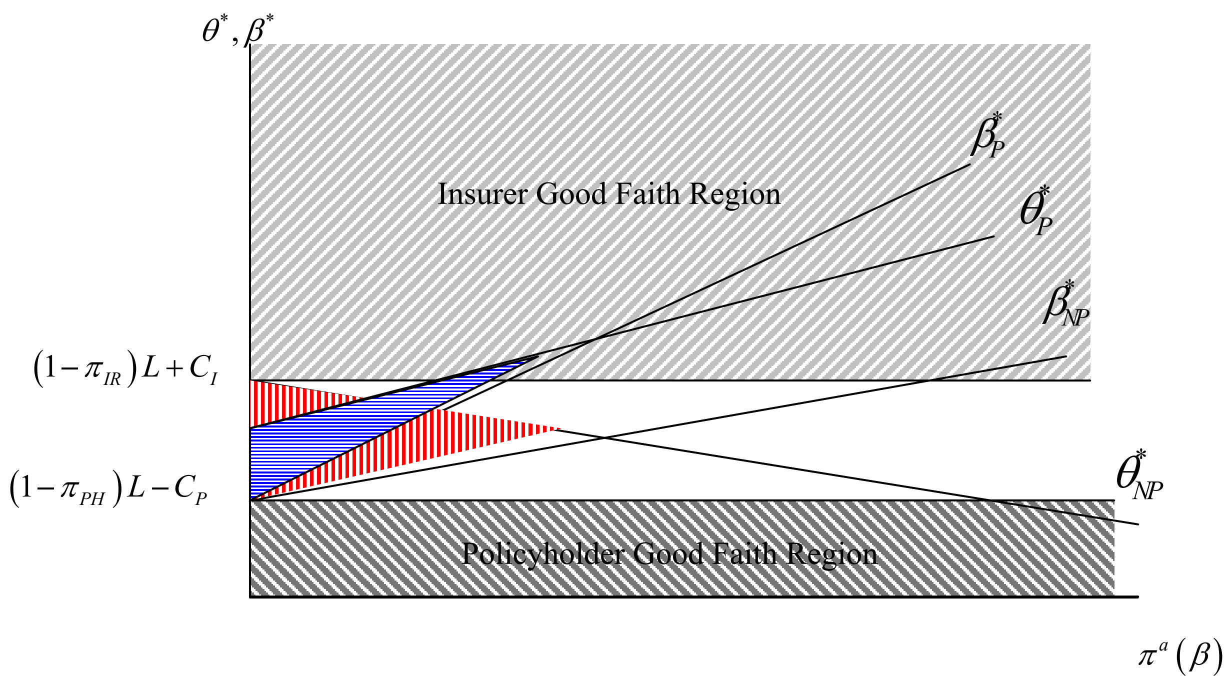
(19) implies that the potential deadweight cost is directly related to the amounts both parties alter the societal optimal offer in order to extract rents based on the settlement beliefs. (16) and (19) clearly imply that there will be fewer out of court settlements with the existence of punitive damages. Therefore, with the current system of asymmetric punitive damage awards, we have plaintiffs attempting to take advantage of defendants by requiring much higher settlement amounts, which in turn, tends to send the matters to court. Without punitive damages, settlements would be much more likely. We now turn

to the case where both the defendant and the plaintiff have the possibility of having punitive damages levied against them.

Alternative Definitions of Bad Faith

Recall Figure 3 from above:

Figure 3



Currently, bad faith is defined as situations when parties ask for (offer) more (less) than their expected compensatory outcome from the court proceedings. In this situation, the existence of punitive damages allow for some settlements in the insurer good faith region, but never in the insured good faith region. Without punitives, settlements always occur outside of both regions. The definition of bad faith can be changed in several intuitively appealing ways that will give a slightly different result.

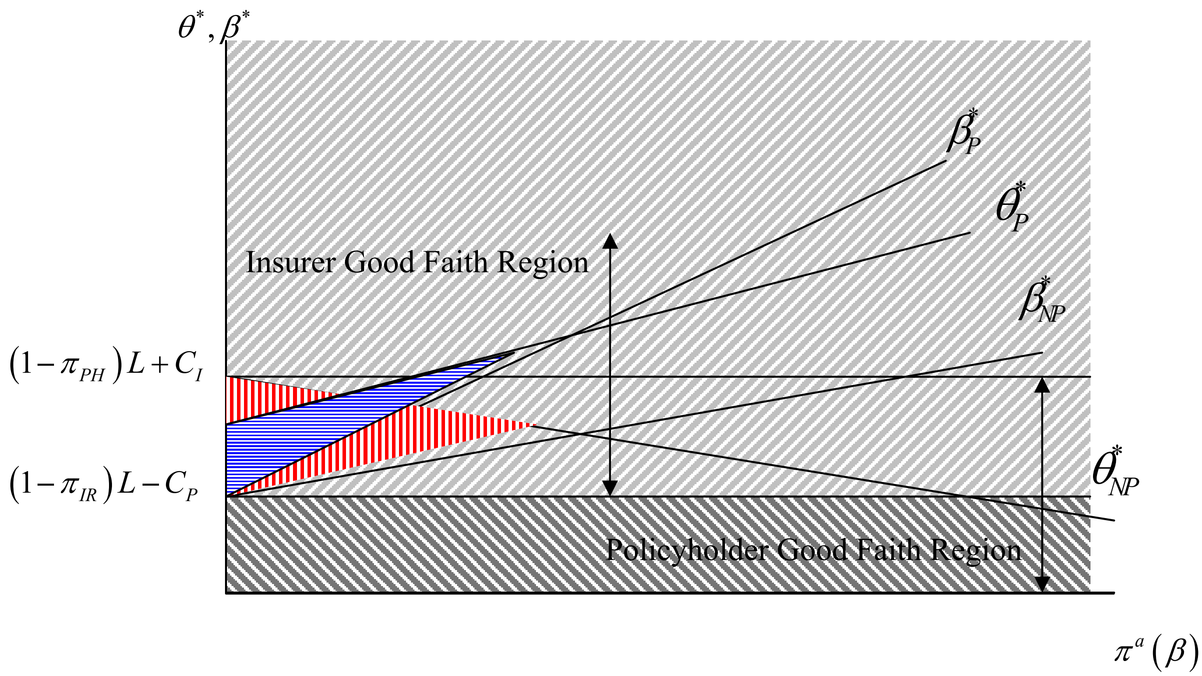
Definition 2: "Bad faith" is defined as an offer (demand) by the insurer (insured) that is below (exceeds) the expected compensatory loss.

Notice that this definition does not include court costs for either party involved. This serves to shift the good faith region in Figure 3 up for the policyholder and down for the insurer. If we assume that the probability of a court verdict is known to both the insured and insurer, then in Figure 3 everything above (below) $\left(1-\pi\right)L$ would be the good faith region for the insurer (insured). Therefore, settlements would always occur in a good faith region of one party, but not both. That is, there will still be one party that bargains in bad faith. Additionally, there will be situations now where the insured is bargaining in good faith (even with punitive damages). With the original definition of bad faith, the insured never bargained in good faith.

Definition 3: "Bad faith" is defined as an offer (demand) by the insurer (insured) that is below (exceeds) the expected compensatory loss minus (plus) the court cost of the insured (insurer).

This definition may seem confusing, but it has a certain degree of intuitive appeal. Consider a situation where two parties are bargaining and where they have the option to pay to go to court to settle their claim. One party may temper his offer by the court costs of the other. The first party knows that the other party is expecting some value from court, but will have to pay to get it, and will therefore take what he is expecting minus a small fee that is smaller than the court costs. This will effectively "flip-flop" the good faith demarcations in Figure 3 as follows:

Figure 4



Now, the very nice result occurs where settlements can occur in the good faith region of both the policyholder and insurer.

Symmetric Punitive Damage Awards

A solution to the one-sided bad faith bargaining can possibly be found in a system where both parties have the threat of punitive damage awards being awarded against them. We offer that model and its solution below. Because the insurer can now reap an additional advantage (punitive damage award) from the insured, the insurer's expected cost changes and (1) is now written as:

$$\theta_s \pi^a(\theta_s) + \left(1-\pi^a(\theta_s)\right)\left[(1-\pi_{IR})\left(L + P\pi^P(\theta_s)\right) - P\pi_{IR}\pi^P(\beta_s) + C_I\right] \tag{20}$$

So, the insurer's problem is now:

$$\min_{\theta_s} \theta_s \pi^a(\theta_s) + \left(1-\pi^a(\theta_s)\right)\left[(1-\pi_{IR})\left(L + P\pi^P(\theta_s)\right) - P\pi_{IR}\pi^P(\beta_s) + C_I\right] \tag{21}$$

The FOC, with respect to θ_s is:

$$\begin{aligned}&P\pi_\theta^P(\theta_s)(1-\pi_{IR}) - \pi_\theta^a(\theta_s)\left[(1-\pi_{IR})\left(L + P\pi^P(\theta_s)\right) - P\pi_{IR}\pi^P(\beta_s) + C_I\right]\\&+\pi^a(\theta_s) + \theta_s\pi_\theta^a(\theta_s) - \pi^a(\theta_s)(1-\pi_{IR})P\pi_\theta^P(\theta_s) = 0\end{aligned} \tag{22}$$

Rearranging, we obtain:

$$\begin{aligned}\theta_s^* &= (1-\pi_{IR})\left(L + P\pi^P(\theta_s^*)\right) - P\pi_{IR}\pi^P(\beta_s) + C_I\\&-\frac{P\pi_\theta^P(\theta_s^*)(1-\pi_{IR})\left(1-\pi^a(\theta_s^*)\right) + \pi^a(\theta_s^*)}{\pi_\theta^a(\theta_s^*)}\end{aligned} \tag{23}$$

This is the symmetric analogue of (4). The equations are similar, except the insurer reduces now his offer by the expected value of the punitive damage award that the insurer could potentially receive. So, under a symmetric system, the insurer will (expectably) reduce his offer to the insured. But, there is still the rent extracting behavior going on. The relative offers with the symmetric system to decrease, but there is still the possibility that an insurer acts in bad faith. The insurer now simply reduces the expected court verdict by the amount the insurer expects to win. This in and of itself does not qualify as bad faith. Now, lets turn to the policyholder to see how his behavior changes. His expected gain is now written as:

$$\beta_s \pi^a(\beta_s) + (1-\pi^a(\beta_s))\left[(1-\pi_{PH})(L+P\pi^P(\theta_s)) - P\pi_{PH}\pi^P(\beta_s) - C_P\right] \tag{24}$$

Again, the policyholder will choose β_s to maximize (24). This is mathematically written as:

$$\max_{\beta_s} \beta_s \pi^a(\beta_s) + (1-\pi^a(\beta_s))\left[(1-\pi_{PH})(L+P\pi^P(\theta_s)) - P\pi_{PH}\pi^P(\beta_s) - C_P\right] \tag{25}$$

The FOC, with respect to β_s is:

$$\begin{aligned} &\pi^a(\beta_s) + \beta_s\pi^a_\beta(\beta_s) - \pi^a_\beta(\beta_s)\left[(1-\pi_{PH})(L+P\pi^P(\theta_s)) - P\pi_{PH}\pi^P(\beta_s) - C_P\right] \\ &-P\pi_{PH}\pi^P_\beta(\beta_s) + \pi^a(\beta_s)P\pi_{PH}\pi^P_\beta(\beta_s) = 0 \end{aligned} \tag{26}$$

Rearranging, we obtain the result:

$$\beta_s^* = \left(1-\pi_{PH}\right)\left(L + P\pi^P\left(\theta\right)\right) - P\pi_{PH}\pi_\beta^P\left(\beta_s^*\right) - C_P + \frac{P\pi_{PH}\pi_\beta^P\left(\beta_s^*\right)\left(1-\pi^a\left(\beta_s^*\right)\right) - \pi^a\left(\beta_s^*\right)}{\pi_\beta^a\left(\beta_s^*\right)} \tag{27}$$

The first term is just the expected value of a favorable judgment (including punitive damages). This is the same result as before. The second term simply decreases the policyholder's demand by the expected value of an unfavorable judgment. The third term reduces the demand by the court costs. The fourth term, reduces the amount of β_s^* since $\pi_\beta^a\left(\beta_s^*\right) < 0$ and $P\pi_{PH}\pi_\beta^P\left(\beta_s^*\right)\left(1-\pi^a\left(\beta_s^*\right)\right) - \pi^a\left(\beta_s^*\right) > 0$. This is the policyholder analogue of (23), with one minor difference. The insured always reduces his demand away from the expected court outcome. Recall that in the asymmetric system the insured always bargained in bad faith and made unfair settlement demands. Now the symmetric system induces the insured to make "fairer" settlement demands. Figure 5 below graphically shows how the offers and demands change between the asymmetric and symmetric punishment regimes.

Figure 5

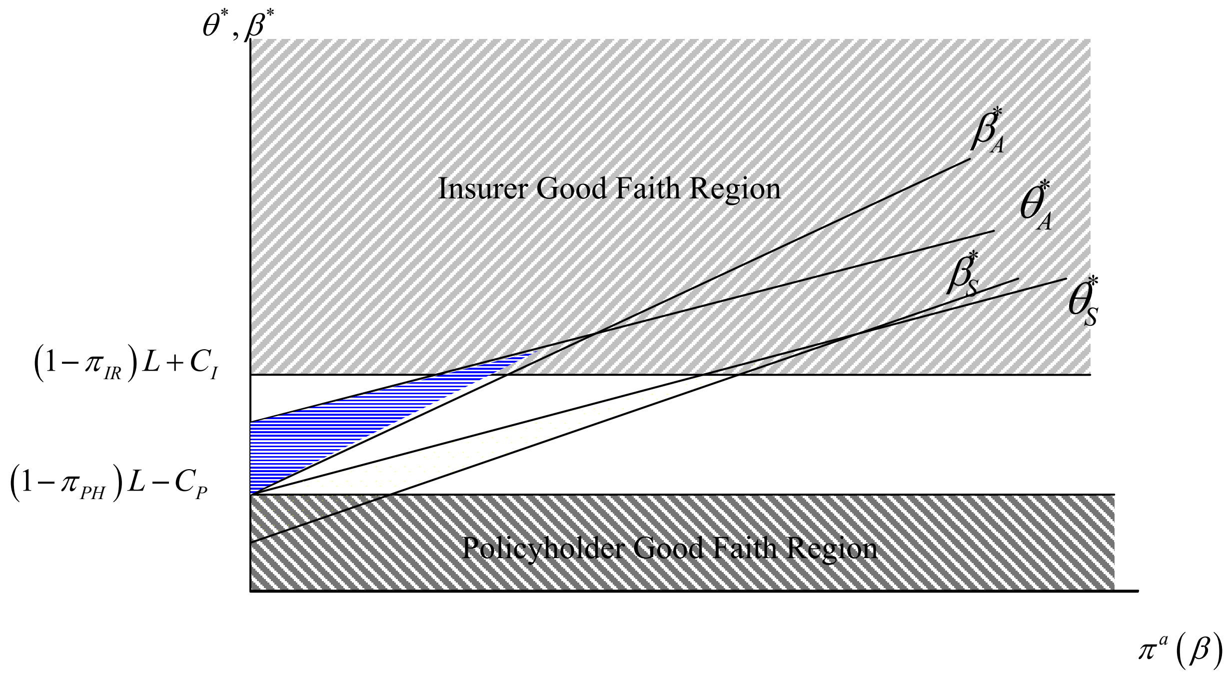


Figure 5 illustrates the relative downward shift in the offers of the two parties. Figure 5 also shows that settlements can occur in the policyholder's good faith region, the insurer's good faith region, or neither. This result is unlike the asymmetric case where settlements cannot occur in the policyholder's good faith region. [For this discussion, bad faith refers to "bad faith definition 1" above.]

Notice that our result does not preclude a system where policyholders are prosecuted for fraud. We can consider the punitive damage award levied against the policyholder as a fine and/or the monetary value of a jail sentence. The only difference that would occur is that this award would not accrue to the insurer. A hybrid type result then occurs. The insurer's offer stays the same as in the asymmetric case, while the insured's demand decreases as a result of the penalty. Pre-trial settlements obviously occur more in this hybrid state, relative to the asymmetric state.

Again, we can determine when a settlement will occur. The same idea holds for the symmetric punitive damages case and we have $\theta_s^* > \beta_s^*$ when:

$$C_I + C_P > \left(L + P\pi^P\left(\theta_s^*\right)\right)\left(\pi_{IR} - \pi_{PH}\right) + P\pi^P\left(\beta_s^*\right)\left(\pi_{IR} - \pi_{PH}\right) + \frac{P\pi_{PH}\pi_\beta^P\left(\beta_s^*\right)\left(1-\pi^a\left(\beta_s^*\right)\right) - \pi^a\left(\beta_s^*\right)}{\pi_\beta^a\left(\beta_s^*\right)} + \frac{P\left(1-\pi_{IR}\right)\pi_\theta^P\left(\theta_s^*\right)\left(1-\pi^a\left(\theta_s^*\right)\right) - \pi^a\left(\theta_s^*\right)}{\pi_\theta^a\left(\theta_s^*\right)} \quad (28)$$

We can determine the optimal punitive damage award to induce a settlement as:

$$P_s^* = \frac{C_I + C_P - L\left(\pi_{IR} - \pi_{PH}\right) + \dfrac{\pi^a\left(\beta_s^*\right)}{\pi_\beta^a\left(\beta_s^*\right)} - \dfrac{\pi^a\left(\theta_s^*\right)}{\pi_\theta^a\left(\theta_s^*\right)}}{\left(\pi_{IR} - \pi_{PH}\right)\left(\pi^P\left(\theta_s^*\right) + \pi^P\left(\beta_s^*\right)\right) + \dfrac{\pi_{PH}\pi_\beta^P\left(\beta_s^*\right)\left(1-\pi^a\left(\beta_s^*\right)\right)}{\pi_\beta^a\left(\beta_s^*\right)} + \dfrac{\left(1-\pi_{IR}\right)\pi_\theta^P\left(\theta_s^*\right)\left(1-\pi^a\left(\theta_s^*\right)\right)}{\pi_\theta^a\left(\theta_s^*\right)}} \quad (29)$$

Again, if we set $\pi_{IR}=\pi_{PH}=$ ½ , we will have a settlement if:

$$C_I + C_P > \frac{.5P\pi_\beta^P\left(\beta_s^*\right)\left(1-\pi^a\left(\beta_s^*\right)\right) - \pi^a\left(\beta_s^*\right)}{\pi_\beta^a\left(\beta_s^*\right)} + \frac{.5P\pi_\theta^P\left(\theta_s^*\right)\left(1-\pi^a\left(\theta_s^*\right)\right) - \pi^a\left(\theta_s^*\right)}{\pi_\theta^a\left(\theta_s^*\right)} \quad (30)$$

Notice that both θ^* and β^* were reduced when symmetric punitive damage awards were introduced. We can check to see the relationship between $\beta^* - \beta_s^*$ and $\theta^* - \theta_s^*$. If $\beta^* - \beta_s^*$ >(<) $\theta^* - \theta_s^*$, the symmetric award structure has increased (decreased) the likelihood that a settlement is reached. This results from the insured reducing his settlement offer by more than the insurer. Ideally we would hope that the difference between the two awards has decreased given the symmetric award structure. In fact, this is exactly what we see. We find $\beta^* - \beta_s^* > \theta^* - \theta_s^*$ and is:

$$P\pi_{PH}\pi^P\left(\beta_s^*\right) - \frac{P\pi_{PH}\pi_\beta^P\left(\beta_s^*\right)\left(1-\pi^a\left(\beta_s^*\right)\right)}{\pi_\beta^a\left(\beta_s^*\right)} > P\pi_{IR}\pi^P\left(\beta_s^*\right) \tag{31}$$

The second term in (31) is positive as is the difference between the two offers. So, we know the two sides get closer to a settlement by an amount of $\frac{P\pi_{PH}\pi_\beta^P\left(\beta_s^*\right)\left(1-\pi^a\left(\beta_s^*\right)\right)}{\pi_\beta^a\left(\beta_s^*\right)}$. This is also the savings to society when a settlement occurs with symmetric punitive awards. Notice that under a hybrid system, this difference is larger. The insurer does not reduce his offer at all, and the insured reduces his by:

$$P\pi_{PH}\pi^P\left(\beta_s^*\right) - \frac{P\pi_{PH}\pi_\beta^P\left(\beta_s^*\right)\left(1-\pi^a\left(\beta_s^*\right)\right)}{\pi_\beta^a\left(\beta_s^*\right)} \tag{32}$$

(32) is clearly larger than $\frac{P\pi_{PH}\pi_\beta^P\left(\beta_s^*\right)\left(1-\pi^a\left(\beta_s^*\right)\right)}{\pi_\beta^a\left(\beta_s^*\right)}$. This results in the interesting conclusion that moderating a insured's propensity for increasing his demand, while still punishing the insurer can increase settlements.

Table 1 gives a summary of the resulting settlement offers from both the insured and insurer in both the asymmetric and symmetric cases.

	Symmetric Case
Insured's Demand (β)	$\beta_s^* = (1-\pi_{PH})\left(L + P\pi^P(\theta)\right) - P\pi_{PH}\pi_\beta^P\left(\beta_s^*\right) - C_P + \frac{P\pi_{PH}\pi_\beta^P\left(\beta_s^*\right)\left(1-\pi^a\left(\beta_s^*\right)\right) - \pi^a\left(\beta_s^*\right)}{\pi_\beta^a\left(\beta_s^*\right)}$
Insurer's Offer (θ)	$\theta_s^* = (1-\pi_{IR})\left(L + P\pi^P\left(\theta_s^*\right)\right) - P\pi_{IR}\pi^P\left(\beta_s\right) + C_I - \frac{P\pi_\theta^P\left(\theta_s^*\right)(1-\pi_{IR})\left(1-\pi^a\left(\theta_s^*\right)\right) + \pi^a\left(\theta_s^*\right)}{\pi_\theta^a\left(\theta_s^*\right)}$
	Asymmetric Case
Insured's Demand (β)	$\beta^* = (1-\pi_{PH})\left(L + P\pi^P(\theta)\right) - C_P - \frac{\pi^a\left(\beta^*\right)}{\pi_\beta{}^a\left(\beta^*\right)}$
Insurer's Offer (θ)	$\theta^* = \left\{(1-\pi_{IR})L + C_I\right\} + \left\{(1-\pi_{IR})P\pi^P\left(\theta^*\right)\right\} - \left\{\frac{\left(1-\pi^a\left(\theta^*\right)\right)}{\pi_\theta{}^a\left(\theta^*\right)}P\pi_\theta{}^P\left(\theta^*\right)(1-\pi_{IR})\right\} - \left\{\frac{\pi^a\left(\theta^*\right)}{\pi_\theta{}^a\left(\theta^*\right)}\right\}$

All offers are reduced in the symmetric case. This was expected, and is a direct result of the insured now being potentially punished for making unfair offers to the insured. The reduction in the offers also reduces the possibility that the legal matter will actually go to trial. Thus, a symmetric system is preferred to one where only one-sided punitive damages exist. The "true" system that operates in the United States (where the insurer can have punitive damages levied against him, while the insured cannot, but can go to jail) also seems to create a scenario that is preferred to a asymmetric system. That is to say the "true" system creates more out of court settlements, but is still inferior to a perfectly symmetric system.

Court Costs: An Examination of Different Cost Sharing Rules

In all of the above analysis, we have focused on the "American Rule" for paying court costs. That is, each side is responsible for paying his share of court costs. There are alternative schemes, two of which we will examine here. The first is the "English Rule." Under this scheme, the loser of the court proceedings pays all of the court costs. This rule, in theory, keeps potentially frivolous lawsuits out of court. The second system we will examine is a contingency fee structure. Under this system, plaintiff attorneys are only paid if the lawsuit is successful, and then, are paid a certain percentage of the winnings.

The English Rule

As described above, the "English Rule" simply allocates all of the court costs to the loser of the trial. To model this rule, we only have to reallocate when the different parties pay court costs. Now, instead of always paying a fixed cost, the court cost also becomes random. Notice that the existence of the English Rule actually acts as a type of symmetric punitive damage award. That is, whichever party loses the case will have to pay a judgment greater than the compensatory award. Although this extra award is only court cost and is not necessarily as large as a punitive damage award, it could none-the-less be quite substantial.

We will first examine what occurs in the asymmetric system. Recall that under the "American Rule" the insurer seeks to maximize:

$$\theta\pi^{a}(\theta)+\left(1-\pi^{a}(\theta)\right)\left[\left(1-\pi_{IR}\right)\left(L+P\pi^{P}(\theta)\right)+C_{I}\right]$$

Under the "English Rule," the insurer now must pay all of the court costs if they lose, or, pay nothing if they win. They then seek to maximize:

$$\theta\pi^{a}(\theta)+\left(1-\pi^{a}(\theta)\right)\left[\left(1-\pi_{IR}\right)\left(L+P\pi^{P}(\theta)\right)+C_{I}+C_{P}\right] \tag{33}$$

The optimal offer of the insurer becomes:

$$\theta^{*}_{EnglishRule}=\left(1-\pi_{IR}\right)\left(L+P\pi^{P}\left(\theta^{*}\right)+C_{I}+C_{P}\right)+\frac{P\pi^{P}_{\theta}\left(\theta^{*}\right)\left(1-\pi_{IR}\right)\left(1-\pi^{a}\left(\theta^{*}\right)\right)+\pi^{a}\left(\theta^{*}\right)}{\pi^{a}_{\theta}\left(\theta^{*}\right)} \tag{34}$$

Therefore, as long as $\left(1-\pi_{IR}\right)\left(C_{I}+C_{P}\right)>C_{I}$, the insurer's offer will be greater under the "English Rule." This condition is intuitively appealing. If we assume that the court costs between the two parties are equal, then when the insurer believes he is less likely to win (i.e. π_{IR} is low) he will increase his offer (relative to the "American Rule" scheme) in order to avoid having to pay the additional cost of the insured. The analysis for the policyholder is the same, and his optimal demand under the "English Rule" is given as:

$$\beta^*_{EnglishRule} = (1-\pi_{PH})\left(L + P\pi_P(\theta) - C_P - C_I\right) - \frac{\pi^a(\beta^*)}{\pi^a_\beta(\beta^*)} \tag{35}$$

Like the insurer, the insured's demand decreases when his probability of winning decreases. We can now determine the possibility of a settlement being reached. Recall from above that a settlement is only reached if:

$$\begin{aligned}(C_I + C_P)(2-\pi_{IR}-\pi_{PH}) > \left(L + P\pi^P(\theta^*)\right)(\pi_{IR}-\pi_{PH}) + \\ \frac{P\pi^P_\theta(\theta^*)(1-\pi_{IR})\left(1-\pi^a(\theta^*)\right)}{\pi^a_\theta(\theta^*)} - \frac{\pi^a(\beta^*)}{\pi^a_\beta(\beta^*)}\end{aligned} \tag{36}$$

This decision rule also allows for a nice intuitive explanation. Recall the definitions of π_{IR} and π_{PH}. These are, respectively, the insurer and policyholders beliefs of the outcome of a trial. They do not have to sum to one. If they do indeed sum to one, then the "English Rule" in fact does nothing to alter the possibility of a settlement taking place. The expected total court cost that is paid is the same (regardless of how it is divided) and will result in the same expected dead weight societal loss. However, if π_{IR} and π_{PH} in fact do not sum to one, the result is very different. If the sum is less than one (this can happen in numerous ways, but at least one party has to be more pessimistic than the other, or they both feel they are going to lose with the same probability) then the result is that the right hand side of (36) is less than its "American Rule" counterpart and there will be more settlements. Therefore, when either party feels like they are going to lose, the "English Rule" increases their expected payout and forces a larger settlement region. The reverse is of course true when we consider the situation where both parties are overly optimistic regarding their chances of success (i.e. when π_{IR} and π_{PH} sum to greater than 1). Here (36) is larger than the "American Rule" version and the settlement region will be much smaller. Obviously, when the parties believe they are going to win, the "English Rule" does not help to encourage settlements, but rather has the opposite effect. This is consistent with Shavell (1982) who also shows theoretically that optimistic litigants would rather go to trial. Snyder and Hughes (1990) empirically validate that litigants who do not drop their cases pre-trial (i.e. more optimistic) choose to ultimately go to trial, rather than settle. These results hold for the symmetric case as well. The offers of both the insured and insurer react the same way, and the settlement region is affected the same way.

As hypothesized above, the English Rule does act like a symmetric punitive damage award in the sense that it is generally increasing settlements. This is generally consistent with the literature on the English Rule. The theoretical evidence (summarized by Cooter and Rubinfeld (1989)) shows again that with optimistic beliefs regarding trial outcome, the parties are less likely to settle with the English Rule, as they believe they will recoup all of their court costs by way of a favorable verdict. Snyder and Hughes (1990) also give theoretical justification for higher incidence of settlements when the litigants are not “optimistic.” Posner(1972) concurs that the increased variance in the court outcome is likely to induce more settlements under the English Rule (note that this is especially true for risk averse litigants). The empirical results are also consistent with these hypotheses. Hughes and Snyder (1995) show an increase in settlements in Florida in medical malpractice cases during 1980-1985, when the English Rule was in effect.

Contingency Fees

The contingency fee structure of paying attorney fees will not have the symmetric effect on both the insureds and insurers as the "English Rule" had. Instead, we will only consider the plaintiff as having the option of paying his court costs on a contingency fee basis. As such, the optimal offers for the insurers will not change. The contingency fee structure has two effects on the policyholder's decision process. First, the policyholder does not have to consider legal costs. In the event of a loss, there are no legal costs incurred by the policyholder. However, when the policyholder wins, his winnings will be grossed down a certain percentage (that goes to the attorneys). The policyholder's expected payment is:

$$\beta\pi^a(\beta) + c_f\left(1-\pi^a(\beta)\right)\left(L + P\pi^P(\theta)\right) \tag{37}$$

where c_f is the contingency fee (as a proportion, i.e. $c_f \in (0,1)$) that the policyholder pays the attorneys. The optimal demand from the insured can be shown to be:

$$\beta^*_{ContingencyFee} = \left(1-\pi_{PH}\right)\left(L + P\pi^P(\theta)\right) - \frac{\pi^a\left(\beta^*\right)}{c_f\pi^a_\beta\left(\beta^*\right)} \tag{38}$$

Because c_f is strictly less than one $\beta^*_{ContingencyFee} > \beta^*$. This seems to imply that the insured will have to increase his demand to "make up" for the amount taken by the attorneys. This will therefore reduce the settlement region where the insured and insurer will bargain, and will decrease the likelihood of a settlement occurring. Under a symmetric system, the contingency fee will have the same marginal effect. If we assume that the policyholder will unilaterally pay for any punitive damages imposed on him (in the event of a loss) but will not be responsible for any legal, or court costs, and will still pay a contingency fee in the event of a win, the contingency fee will have the same marginal effect. The demand will increase. This will again reduce the region where the policyholder and insurer will be able to bargain, and fewer settlements will occur.

The contingency fee structure appears to be Pareto suboptimal. In every situation, this fee structure will cause the policyholder to act in such a way that will make out of court settlement less likely. However, the "English Rule" can offer some improvement. With pessimistic parties, the "English Rule" makes settlement more likely than a traditional "American Rule." Alternatively, with overly optimistic parties, the "English Rule" does not perform as well (with respect to inducing settlements).

Conclusion

Our analysis suggests two intuitive results. First, the existence of asymmetric punitive damage awards increases the likelihood that the insured (plaintiff) will bargain in bad faith. He will try to extract the punitive damage award from the defendant in the pre-trial phase of litigation. This seems to be a fundamental flaw with a system that offers asymmetric punitive damage award. If we look at the settlement offers from the two parties we see this result. In the absence of punitive damage awards, the insured will offer to settle the case for his expected compensatory court verdict (simply the value of the loss times the probability of being successful in court) minus court costs. That is, he is willing to reduce his demand by the amount he would save by not going to court.

Additionally, the insured will increase or reduce his demand by some amount by which he believes he can "out-negotiate" the insurer. If the insured believes that the insurer is more likely to accept his demand, then he will increase his demand, and therefore take advantage of the insurer. However, if the insured believes that the insurer is less likely to accept the demand, the insured will reduce his demand. The reverse holds true for insurers. In the absence of punitive damage awards, the insurer will offer to settle for the expected court verdict plus costs. Again, the insurer will be indifferent between paying court costs and giving the same amount to the insured. Also, like the insured, the insurer will alter his award based on the perceived amount of informational advantage he has. That is, he will reduce his offer if he believes his information to be superior, and reduce it if inferior. These basic results are intuitively appealing. We would like to think that a settlement offer (from either side) will reflect the expected outcome of the court's verdict. A settlement should be the amount one party will be willing to take and be indifferent between going to court and settling out of court. This is exactly our result. Each party offers the expected amount of the court verdict, including an allowance for private information. When we add punitive damages to this asymmetric system, we have an imbalance between the two parties. Now only the insured has access to a lottery with a potential huge payoff. The problem lies in the fact that the insured will now only be indifferent between going to court and settling if he can obtain the expected value of that lottery in the settlement offer. That is to say, the insured will still never settle for less than the expected court verdict that now includes the potential for a very large punitive damage award. Similarly, the insurer includes this potential punitive damage award and will push up his settlement offer. This results in a situation that is seemingly unfair to the insurer. While he now has an advantage to make more reasonable offers to the insured, he is now being given ridiculously high demands by the insured. As such, we see an equilibrium with fewer out of court settlements.

The second main result we see comes as we introduce symmetric punitive damages, and level the playing field. We find that the settlement offers of both the defendant and plaintiff decrease. The same logic of the offers returns to the result where there are no punitive damages. The insured's and insurer's offer still incorporate the expected court award. However, both the insured and insurer have the possibility of a punitive damage award being levied against them. As such, we see more potential out of court settlements, when compared to the asymmetric system. This is a direct result of the fact that the insured's demand decreases by more than the insurer's offer (with respect to the asymmetric case) allowing for a greater likelihood of settlement between the two parties. Under the symmetric system, we still see the insurer and insured making offers that include reductions (or increases) due to informational asymmetry, but we do see the insurer and insured settling more out of court.

We also find that adopting different court cost allocation rules does little to change our analysis. The English Rule does not change the likelihood of settlements. However, with a contingency fee structure, the situation does change and demands from the insured increase.

Our model is the first to incorporate punitive damages into the pre-trial bargaining. In the next step, we would like to analyze the effects of this completely symmetric legal system on the pricing of insurance. Further exploration of this topic may also be beneficial. Relaxing, and/or changing some of our assumptions could yield interesting (although probably not much different) results. Allowing differing informational structures between the parties could impact the results we find here. Specifically, assuming that the defendant (insurer) has more information regarding the probability of a court victory may tend to reduce the settlement demands made by the insured. This could potentially result in increasing out of court settlements.

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