Comparing All-Or-Nothing and Proportionate Damages: A Rent Seeking Approach

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COMPARING ALL-OR-NOTHING AND PROPORTIONATE DAMAGES: A RENT SEEKING APPROACH

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Abstract: This paper compares the all-or-nothing and proportionate damage rules for allocating damages in tort cases under evidentiary uncertainty. The focus is on how the two rules affect litigation expenditures by plaintiffs and defendants. The results of simulation experiments show that the expected judgment at trial is higher under the all-or-nothing rule for cases where the defendant did not take adequate care, but the judgment is higher under the proportionate rule when the defendant took more than adequate care. As for litigation expenditures, assuming equal costs of litigation, overall expenditures are higher under the all-or-nothing rule, except for very weak and very strong cases.

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1. Introduction

In the presence of evidentiary uncertainty, various decision rules are imaginable for courts to use in awarding damages. The dominant rule in civil litigation is the all-or-nothing (AON) rule, which, coupled with a preponderance of the evidence standard of proof, requires the defendant to pay the plaintiff's entire damages if it's more likely than not that the defendant is liable. One alternative which is often praised for its accuracy and fairness is the proportionate damages (PD) rule (Allen et al., 1964, Abramowicz, 2001). Under this rule, the defendant is obliged to pay damages to the plaintiff in proportion to the probability that the defendant is liable for those damages. Comparing the two rules, the court award is thus higher under the AON rule if the plaintiff's claim is supported by the preponderance of the evidence, and higher under the PD rule in the opposite case.

Although the question of which rule to use in case of evidentiary uncertainty is obviously one of the fundamental choices of any civil legal system (Levmore, 1990), only a few studies have compared both rules.[1] Most recently, Leshem and Miller (2009) compare the AON standard and the PD standard by analyzing their incentive effects on the parties' decision to settle the case ex post and on the defendant's decision to comply with the legal standard ex ante. They show that the AON rule generally induces a higher rate of compliance, although it may result in a higher level of litigation. They therefore conclude that if minimizing the expected cost of the primary activity is the society's main goal, then an AON rule is usually superior.

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[1] See Kaye (1982), Orloff and Stedinger (1983), Shavell (1985).

This article provides a complementary analysis of the relative impacts of an AON rule compared to a PD rule on the litigation expenditures of plaintiffs and defendants in a model of evidentiary uncertainty.[2] Using a rent seeking model in which plaintiffs and defendants choose their litigation expenditures at trial, we specifically show that (1) the expected judgment is typically higher under an AON rule as compared to a proportionate damages rule when the defendant did not take adequate care, but the expected judgment is typically lower under an AON rule when the defendant took adequate care; and (2) overall litigation expenditures are most often larger under an AON rule when the parties have equal access to evidence, but when access to evidence is less costly for the party with the stronger case, the difference in rent seeking expenditures between the two rules decreases.

This article unfolds as follows. In the next section, we take a formal approach to both rules and determine the equilibrium litigation expenditures of both parties. Section 3 then uses simulations to compare the two rules in terms of the expected judgment and total litigation expenditures. Finally, section 4 concludes.

2. The Model

2.1. General

In tort cases involving evidentiary uncertainty, we can use Bayes' rule to compute the conditional probability that the defendant was negligent, denoted P_1, as follows:

$$P_1 = \frac{P_0 XF}{P_0 XF + (1 - P_0)Y(1 - F)} \tag{1}$$

where

P_0 = court's prior probability that the defendant is negligent, $P_0 \in [0,1]$;

F = index of the factual guilt of the defendant, normalized so that $F \in [0,1]$;

X = plaintiff's litigation effort;

Y = defendant's litigation effort.

In this formulation, P_0 can be interpreted as a measure of the court's "bias." Specifically, if $P_0 = \frac{1}{2}$, the court is unbiased, whereas if $P_0 > (<)\frac{1}{2}$, it can be said to have a pro-plaintiff (pro-defendant) bias. Also, XF can be interpreted as the "evidence against" the defendant, which depends positively on both the factual evidence against him and the plaintiff's litigation effort. Likewise, $Y(1-F)$ is the "evidence for" the defendant.

It will be useful to rewrite (1) as follows

$$P_1 = \frac{F}{F + \theta R(1 - F)} \tag{2}$$

where $\theta \equiv \frac{1 - P_0}{P_0}$ and $R \equiv \frac{Y}{X}$. Thus, $\theta = 1$ indicates an unbiased court, whereas $\theta > (<)1$ indicates a pro-defendant (pro-plaintiff) bias. Similarly, $R = 1$ indicates equal litigation effort by the two parties, whereas $R > (<)1$ indicates relatively more effort by the defendant (plaintiff). Finally, $F \rightarrow 1$ indicates a strong case for the plaintiff and $F \rightarrow 0$ indicates a strong case for the defendant.

Because our focus is on litigation expenditures, we abstract from the decision of injurers of whether or not to comply with the due care standard. Rather, we treat the compliance decision as sunk and measure it by the index F such that when the defendant took just enough care to satisfy the due care standard, $F = 1/2$.[3] Thus, F decreases below $1/2$ as the defendant took more than due care, and in the limit where F reaches zero, the plaintiff can never win his case, no matter how much he spends relative to the defendant. Conversely, F increases above $1/2$ as the

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[3] This implies that if the parties do not spend anything on evidence production, or if they spend an equal amount on evidence production, the parties have an equal chance of winning. However, as we stress further on, if the defendant took adequate care, his unit costs of evidence production will usually be lower than the unit costs of evidence production of the plaintiff, and this will lead to a larger win rate for the defendant than 0.5.

defendant took less care than due care (or when the defendant intentionally caused the harm), and at the point where F reaches one, the plaintiff wins the case with certainty, no matter how much the defendant spends.

2.2. Comparing the All-or-Nothing and Proportional Liability Rules

The AON and PD rules can now be characterized in terms of P_1 as defined in (2). First, under the AON rule, the court will judge that the defendant is either fully liable for the plaintiff's damages, denoted J, or not liable, depending on whether P_1 exceeds the evidentiary threshold, t. Thus, the defendant's expected liability under this rule can be written as

$$L_A = \begin{cases} J, & if \ P_1 \geq t \\ 0, & if \ P_1 < t \end{cases} \tag{3}$$

where, under the usual preponderance-of-the-evidence standard, $t=\frac{1}{2}$. Alternatively, under the PD rule, the defendant faces liability equal to the plaintiff's loss, scaled by the conditional probability that the defendant's negligence caused the accident. Thus, the court will assess liability equal to

$$L_P = P_1 J \tag{4}$$

Figures 1 and 2 compare these two rules by graphing L_A and L_P as functions of F, the strength of the case against the defendant.

First consider the AON rule with $t=\frac{1}{2}$. According to (2), the defendant is held fully liable if

$$F \geq \frac{\theta R}{1 + \theta R} \tag{5}$$

and not liable otherwise, where the term on the right-hand side $> (<) \frac{1}{2}$ as $\theta R > (<) 1$. Thus, suppose the combination of court bias and litigation effort favors the defendant, or $\theta R > 1$. In this case, the range of factual scenarios over which the plaintiff recovers is limited to those where F

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is strictly greater than ½; that is, where the factual basis of guilt is relatively strong. This case is shown in Figure 1, where the step function depicts L_A. Conversely, if the combination of court bias and litigation effort favors the plaintiff, $\theta R < 1$, then the range over which the plaintiff recovers expands to include values where F is strictly less than ½; that is, weaker cases. The step function in Figure 2 shows this case.

[Figure 1 here]

Now consider the PD rule. Differentiating (4) shows that $\partial L_P / \partial F > 0$, but

$$\frac{\partial^2 L_P}{\partial F^2} > (<)0 \ \ \text{as} \ \ \theta R > (<) \ 1. \tag{6}$$

Thus, L_P is continuously increasing in F, with $L_p(0)=0$ and $L_p(1)=J$. However, it is convex when $\theta R > 1$ (shown in Figure 1) and concave when $\theta R < 1$ (shown in Figure 2).

[Figure 2 here]

Note that both rules reflect the impact of bias created by the legal process (court plus litigation bias), but they do so in different ways. Under the AON rule, the bias shifts the threshold separating zero and full liability, whereas under the PD rule, the bias changes the defendant's share of liability. The direction of the effects is the same, but the impacts are qualitatively different, reflecting the threshold nature of AON rule versus the continuous nature of the PD rule. In particular, the PD rule smooths the effect of the bias. The next section asks how this difference affect the litigation efforts of plaintiffs and defendants.

2.3. Litigation Expenditures under All-or-Nothing and Proportionate Damages

As noted in the introduction, the specific question of interest here is how the two rules affect the litigation efforts of the parties—that is, the plaintiff's choice of X and the defendant's choice of Y. To answer this question, we first need to account for the uncertain outcome of a trial. Specifically, the parties have to form an expectation about their chances of winning under

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the AON rule, and the fraction of victim damages that will be attributed to the defendant under the PD rule. To do this, we suppose that the source of uncertainty at trial is the court's bias. Thus, we assume that F is common knowledge,[4] but that P_0 is a random variable whose distribution is known by both parties. For simplicity, we assume that P_0 is uniformly distributed on [0,1].

Under the AON rule, the plaintiff's objective is to choose X to maximize

$$P(X,Y)J - C_p X, \tag{7}$$

while the defendant chooses Y to minimize

$$P(X,Y)J + C_d Y, \tag{8}$$

where $P(X,Y)$ is the plaintiff's probability of winning, and C_p and C_d are the unit costs of litigation for the plaintiff and the defendant, respectively. The first-order conditions defining the reaction functions for the plaintiff and defendant, respectively, are

$$P_X J - C_p = 0 \tag{9}$$

$$P_Y J + C_d = 0. \tag{10}$$

Simultaneous solution of these two equations determines the Nash equilibrium levels of effort: (X^*, Y^*).

The probability of plaintiff victory under the AON rule with a preponderance-of-the-evidence standard is given by

$$P(X,Y) = \text{prob} \left(P_1 > 1/2 \right)$$

$$= \text{prob} \left(P_0 > \frac{Y(1-F)}{Y(1-F)+XF} \right) \tag{11}$$

For a uniform distribution of the court's prior, this becomes

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[4] This can be justified by supposing that the facts of the case are made public during pre-trial discovery.

$$P(X,Y) = 1 - \frac{Y(1-F)}{Y(1-F)+XF} = \frac{XF}{XF+Y(1-F)}$$ (12)

Using this expression in (9) and (10) yields the following Nash equilibria effort levels:

$$X^* = \frac{F(1-F)}{C_d(F+(1-F)\dfrac{C_p}{C_d})^2}J \quad \text{and} \quad Y^* = \frac{C_pF(1-F)}{(C_dF+(1-F)C_p)^2}J$$ (13)

These values can then be used to calculate the equilibrium expenditures at trial of the two parties, C_pX^* and C_dY^*, the expected judgment at trial, $P(X^*,Y^*)J$, and the overall expected value of trial to the plaintiff and the expected cost of trial to the defendant (i.e., the optimized values of the expressions in (7) and (8)). Explicit expressions for these quantities are given in the Appendix.

Under a PD rule, there is no "winner" or "loser" at trial; rather, the defendant pays damages in proportion to the probability that he caused the plaintiff's loss, J. Thus, the plaintiff's expected judgment at trial is given by $E(P_1)J$, and the plaintiff chooses X to maximize

$$E[P_1(X,Y)]J - C_pX,$$ (14)

while the defendant chooses Y to minimize

$$E[P_1(X,Y)]J + C_dY,$$ (15)

where $P_1(X,Y)$ is given by (1). For the case where P_0 is uniformly distributed, we compute

$$E[P_1(X,Y)]J = \int_0^1 \frac{P_0XF}{P_0XF+(1-P_0)Y(1-F)}JdP_0$$

$$= \frac{XF(XF-Y(1-F))+XYF(1-F)(\ln(Y(1-F)-\ln(XF))}{(XF-Y(1-F))^2}J$$ (16)

The first-order conditions for the plaintiff's and defendant's problems can again be solved simultaneously to obtain the Nash equilibrium effort levels, (X^{**},Y^{**}). These equilibrium effort levels can then be used, as above, to compute the expected trial expenditures of the two parties,

the expected judgment, and the plaintiff's expected value and the defendant's expected cost of a trial. The resulting expressions for these various quantities are also given in the Appendix.

Given the complexity of the expressions, it is not generally possible to compare the outcomes under the two rules analytically. However, the next section uses numerical simulations to reveal the key differences.

3. Implications

3.1. Expected judgment

The AON and PD rules have different effects on the expected judgment for relatively weak (low F) and relatively strong (high F) cases. Figure 3 shows this for the case where the unit costs of litigation are the same for the plaintiff and the defendant ($C_p=C_d$).[5] The blue line represents the expected judgment under the AON rule, and the red line represents it under the PD rule. As shown, for cases in which the defendant took more than adequate care ($F<1/2$), the expected judgment is higher under the PD rule; for strong cases in which the defendant did not take adequate care ($F>1/2$), the expected judgment is higher under the AON rule; and when the defendant took just enough care ($F=1/2$), the expected judgment is the same under both rules. In other words, the PD rule tends to impose greater expected damages on careful defendants and less expected damages on negligent defendants as compared to the AON rule. Although both rules smooth expected damages based on the uncertainties of trial, the PD rule smooths *less* than the AON rule and in the wrong direction.

[Figure 3 here]

We next consider the case where the unit costs of litigation for the two parties differ. We conjecture that the plaintiff's unit costs will tend to be higher for relatively weak cases than for

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[5] For sake of simplicity, we have set J=1.

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relatively strong cases. For example, the weaker a case is (i.e., the smaller is F), the easier it will be for the defendant to find evidence in his favor (Sanchirico, 2001). Specifically, producing forged evidence is usually more expensive than producing truthful evidence because a document that looks real is presumably less expensive to produce when it is in fact real. Likewise, it is cheaper to produce consistent testimony when it is truthful. Figure 4 shows the case where the unit costs of the plaintiff are twice as high as those of the defendant ($C_p=2C_d$), and Figure 5 shows the case where the reverse is true ($C_p=1/2C_d$).

In Figure 4 the region $F<1/2$ is therefore most relevant, whereas in Figure 5 the region where $F>1/2$ is most relevant. In both cases, we can conclude that the above results are amplified. Specifically, when $F<1/2$, the expected judgment is higher under the PD rule; when $F>1/2$, the expected judgment is higher under the AON rule; and in both cases the differential is larger.

[Figures 4 and 5 here]

3.2. Total litigation expenditures

We now consider the total rent-seeking expenditures of the two parties. Figure 6, which assumes equal litigation costs ($C_p=C_d$), shows that these expenditures are larger under the AON rule than under the PD rule, except for extremely weak and extremely strong cases. And since most cases that end up a trial will involve an F near the due care standard (Priest and Klein, 1984), it would therefore seem that the AON rule will generally involve greater litigation expenditures. This makes sense since the difference between winning and losing is larger under the AON rule, which makes the stakes of trial larger. Hence, rent-seeking will be more intense under that rule.

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When a case is very weak or very strong, litigation expenditures have little effect under the AON rule because it will be very difficult to satisfy the standard of proof. In contrast, expenditures have larger benefits under the PD rule. The expenditures may to some extent increase (decrease) the court's perception of the likelihood that the defendant was negligent, and this always increases (decreases) damages under a rule of proportionate damages. However, these extreme cases will rarely end up in litigation rather than settling before trial.

[Figure 6 here]

Finally, figures 7 and 8 look at the cases where the unit costs of the plaintiff are larger than the unit costs of the defendant ($C_p=2C_d$), and where the unit costs of the plaintiff are smaller than the unit costs of the defendant ($C_p=1/2C_d$), respectively. As the figures show, the expenditure disadvantage of the AON rule decreases as access to evidence gets more costly for the party with the weaker case. The intuition is simple. When the unit costs of the plaintiff increase, his costs of passing the standard of proof increase as well. If he doesn't meet the standard, he gets nothing.[6] Under PD rule, in contrast, meeting the standard of proof is less important.

[Figures 7 and 8 here]

4. Conclusion

This short paper has added to the literature comparing all-or-nothing and proportional damage rules for tort cases by examining the impact of endogenous litigation expenditures in a model of evidentiary uncertainty. Previously, Lesham and Miller (2009) showed that the AON rule has an advantage over the PD rule in terms of increasing legal compliance. Our analysis complements this conclusion by showing that the expected judgment at trial will typically be

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[6] Note that when the underdog spends less effort, the favorite also spends less effort (see Katz, 1988).

larger under the AON rule when the defendant did not take adequate care, and smaller under that rule when the defendant took adequate care. In this sense, the assignment of liability under the AON rule better aligns with the actual behavior of the defendant, which should enhance deterrence. Offsetting this, however, is that the AON rule will generally lead to larger overall litigation expenditures per trial compared to the PD rule. This result reinforces the finding of Lesham and Miller (2009) that the AON rule results in more cases going to trial compared to PD, and arises for the same reason—namely, that the AON rule creates a situation in which more is at stake at trial. However, this disadvantage of the AON rule decreases when access to evidence is less costly for the party with the stronger case.

Appendix

With respect to the all-or-nothing rule, the first order conditions for X and Y are:

$$\frac{F}{XF+(1-F)Y}J-\frac{XF^2}{(XF+(1-F))^2}J=C_p$$

$$\frac{XF(1-F)}{(XF+(1-F)Y)^2}J=C_d$$

From these conditions, it follows that

$$Y^*=\frac{C_p}{C_d}X^*$$

Putting this result back into the first order conditions gives us the equilibrium expenditures for the plaintiff and defendant, respectively:

$$C_pX^*=C_p\frac{F(1-F)}{C_d(F+(1-F)\frac{C_p}{C_d})^2}J$$

$$C_dY^*=C_p\frac{F(1-F)}{C_d(F+(1-F)\frac{C_p}{C_d})^2}J$$

The expected value of trial for the plaintiff under this rule is

$$P(X^*,Y^*)J-C_pX^*=\frac{F}{F+(1-F)\frac{C_p}{C_d}}J-\frac{C_pF(1-F)}{C_d(F+(1-F)\frac{C_p}{C_d})^2}J$$

while the expected cost of trial for the defendant is

$$P(X^*,Y^*)J+C_dY^*=\frac{F}{F+(1-F)\frac{C_p}{C_d}}J+\frac{C_pF(1-F)}{C_d(F+(1-F)\frac{C_p}{C_d})^2}J$$

Under the proportional rule, the first order conditions are:

$$\frac{2XF^2 - F(1-F)Y + YF(1-F)(\ln(Y(1-F) - \ln(XF))) - YF(1-F)}{(XF - Y(1-F))^2} J -$$

$$2\frac{XF(XF - Y(1-F)) + XYF(1-F)(\ln(Y(1-F) - \ln(XF))}{(XF - Y(1-F))^3} FJ = Cp$$

$$\frac{-XF(1-F) + XF(1-F)(\ln(Y(1-F) - \ln(XF))) + XF(1-F)}{(XF - Y(1-F))^2} J +$$

$$2\frac{XF(XF - Y(1-F)) + XYF(1-F)(\ln(Y(1-F) - \ln(XF))}{(XF - Y(1-F))^3} (1-F)J = -C_d$$

from which it follows that

$$Y** = \frac{C_p}{C_d} X**$$

Putting this result back in the first order conditions gives us the Nash equilibrium effort levels of the two parties:

$$X** = \frac{2(F - \frac{C_p}{C_d}(1-F)) + (F + \frac{C_p}{C_d}(1-F))\ln(\frac{C_p}{C_d}\frac{1-F}{F})}{C_p((1-F)\frac{C_p}{C_d} - F)^3} \frac{C_p}{C_d} F(1-F)J$$

$$Y** = \frac{2(F - \frac{C_p}{C_d}(1-F)) + (F + \frac{C_p}{C_d}(1-F))\ln(\frac{C_p}{C_d}\frac{1-F}{F})}{C_d((1-F)\frac{C_p}{C_d} - F)^3} \frac{C_p}{C_d} F(1-F)J$$

The resulting total expenditures of the plaintiff and the defendant, respectively, are

$$C_p X** = \frac{2(F - \frac{C_p}{C_d}(1-F)) + (F + \frac{C_p}{C_d}(1-F))\ln(\frac{C_p}{C_d}\frac{1-F}{F})}{((1-F)\frac{C_p}{C_d} - F)^3} \frac{C_p}{C_d} F(1-F)J$$

$$C_d Y** = \frac{2(F - \frac{C_p}{C_d}(1-F)) + (F + \frac{C_p}{C_d}(1-F))\ln(\frac{C_p}{C_d}\frac{1-F}{F})}{((1-F)\frac{C_p}{C_d} - F)^3} \frac{C_p}{C_d} F(1-F)J$$

The expected judgment equals:

$$E(J) = \frac{F + (1-F)\frac{C_p}{C_d}(\ln(\frac{C_p}{C_d}\frac{1-F}{F})-1)}{(F-(1-F)\frac{C_p}{C_d})^2}FJ$$

The expected value of trial for the plaintiff is

$$\frac{F + (1-F)\frac{C_p}{C_d}(\ln(\frac{C_p}{C_d}\frac{1-F}{F})-1)}{(F-(1-F)\frac{C_p}{C_d})^2}FJ - \frac{2(F-\frac{C_p}{C_d}(1-F))+(F+\frac{C_p}{C_d}(1-F))\ln(\frac{C_p}{C_d}\frac{1-F}{F})}{((1-F)\frac{C_p}{C_d}-F)^3}\frac{C_p}{C_d}F(1-F)J$$

while the expected loss of the defendant equals:

$$\frac{F + (1-F)\frac{C_p}{C_d}(\ln(\frac{C_p}{C_d}\frac{1-F}{F})-1)}{(F-(1-F)\frac{C_p}{C_d})^2}FJ + \frac{2(F-\frac{C_p}{C_d}(1-F))+(F+\frac{C_p}{C_d}(1-F))\ln(\frac{C_p}{C_d}\frac{1-F}{F})}{((1-F)\frac{C_p}{C_d}-F)^3}\frac{C_p}{C_d}F(1-F)J$$

Bibliography

Abramowicz, Michael. 2001. A Compromise Approach to Compromise Verdicts. *California Law Review* 89: 231-313.

Allen, Francis A., et al. 1964. Comments on "Approaches to Court Imposed Compromise-the Uses of Doubt and Reason." *Northwestern University Law Review* 58: 795-805.

Katz. A. 1988. Judicial Decisionmaking and Litigation Expenditure. *International Review of Law and Economics* 8: 127-143.

Kaye, David H. 1982. The Limits of the Preponderance of the Evidence Standard: Justifiably Naked Statistical Evidence and Multiple Causation. *American Bar Foundation Research Journal* 7: 487-516

Leshem, Shmuel, and Geoffrey M. Miller. 2009. All-or-Nothing versus Proportionate Damages. *Journal of Legal Studies* 38: 345-382.

Levmore, Saul. 1990. Probabilistic Recoveries, Restitution, and Recurring Wrongs. *Journal of Legal Studies* 19: 691-726.

Orloff, Neil, and Jery Stedinger. 1983. A Framework for Evaluating the Preponderance-of-the-Evidence Standard. *University of Pennsylvania Law Review* 131: 1159-74.

Priest, George, and Benjamin Klein (1984). The Selection of Disputes for Litigation. *Journal of Legal Studies* 13: 1-55.

Sanchirico, Christopher (2001) Relying on the Information of Interested - and Potentially Dishonest- Parties. *American Law and Economics Review* 3: 320-357.

Shavell, Steven. 1985. Uncertainty over Causation and the Determination of Civil Liability. *Journal of Law and Economics* 28: 587-609.
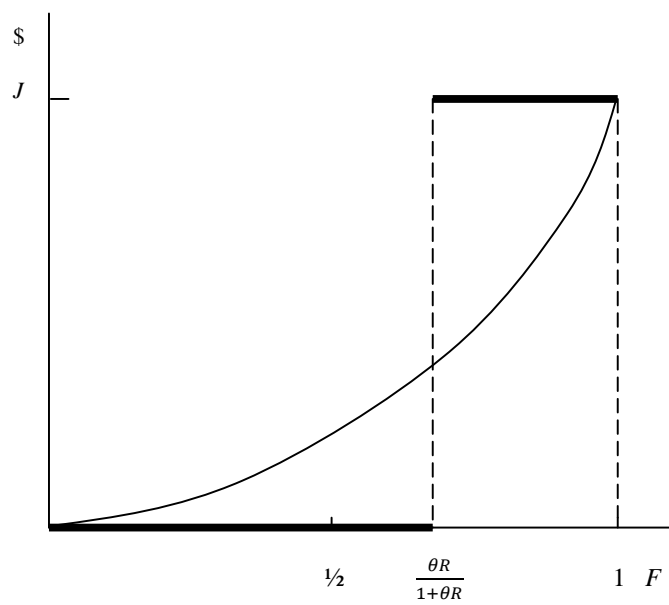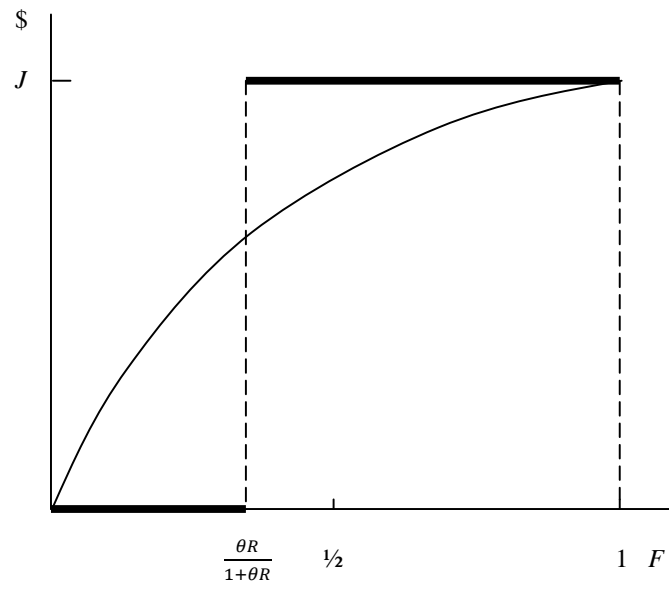
Figure 1. $\theta R > 1$.

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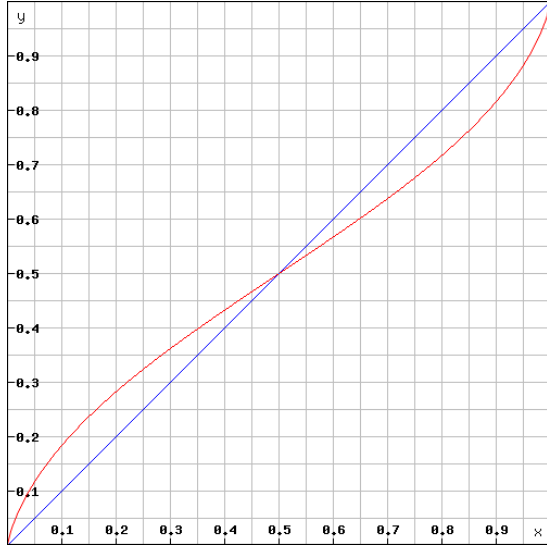**Figure 2.** $\theta R < 1$.

Figure 3. Expected judgment, $C_p = C_d$ (blue=all-or-nothing; red=proportional).
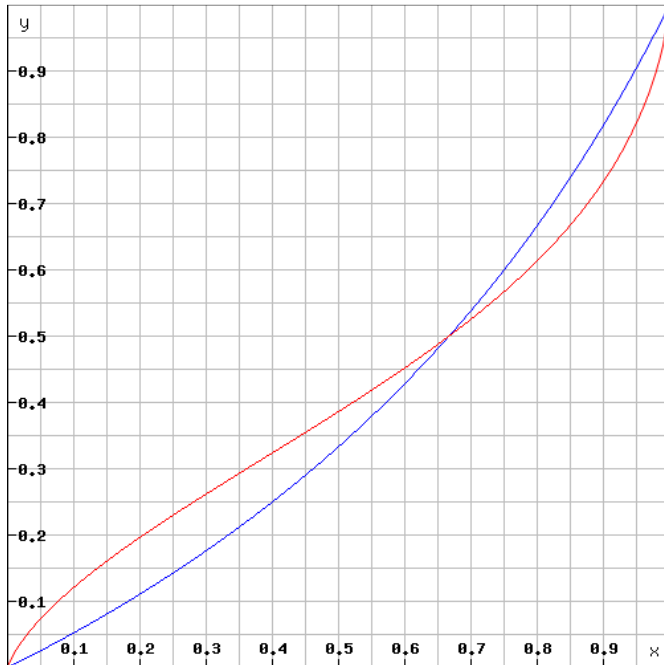

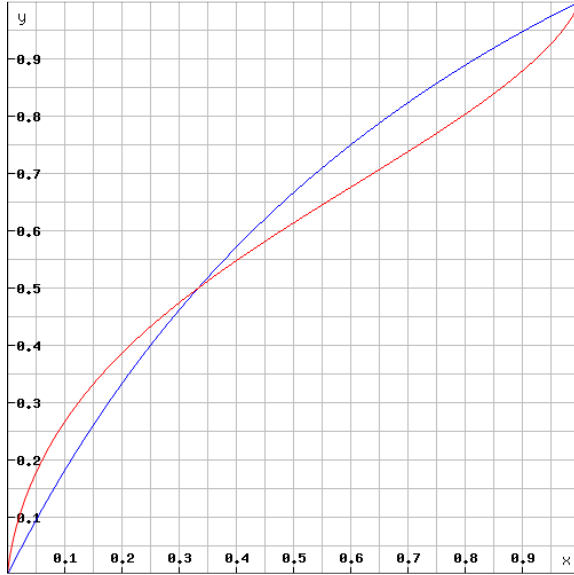**Figure 4.** Expected judgment, $C_p = 2C_d$ (blue=all-or-nothing; red=proportional).

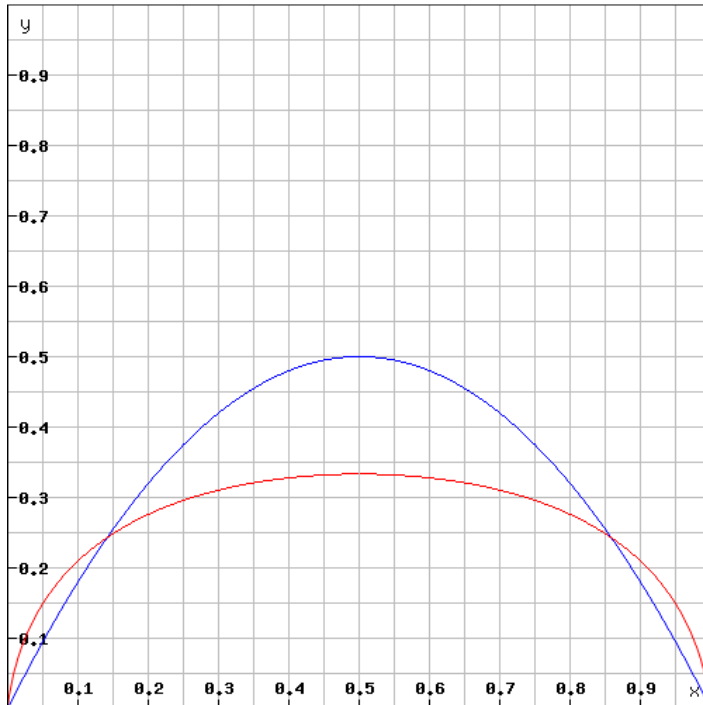**Figure 5.** Expected judgment, $C_p=1/2C_d$ (blue=all-or-nothing; red=proportional).

Figure 6. Total litigation expenditures, $C_p=C_d$ (blue=all-or-nothing; red=proportional).
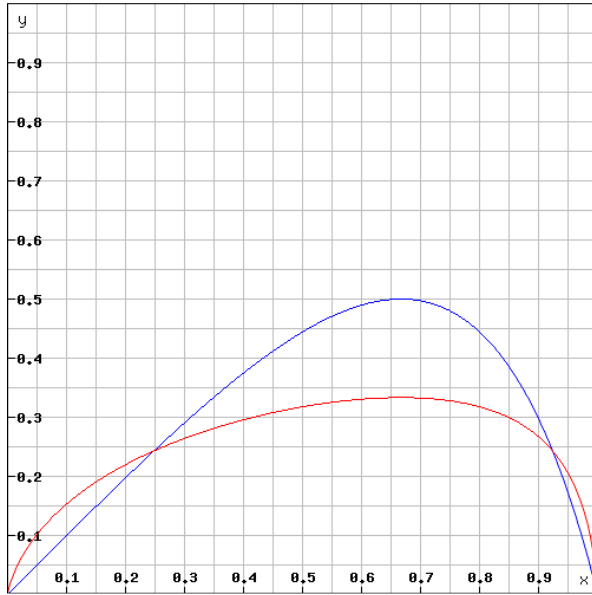
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Figure 7. Total litigation expenditures, $C_p=2C_d$ (blue=all-or-nothing; red=proportional).
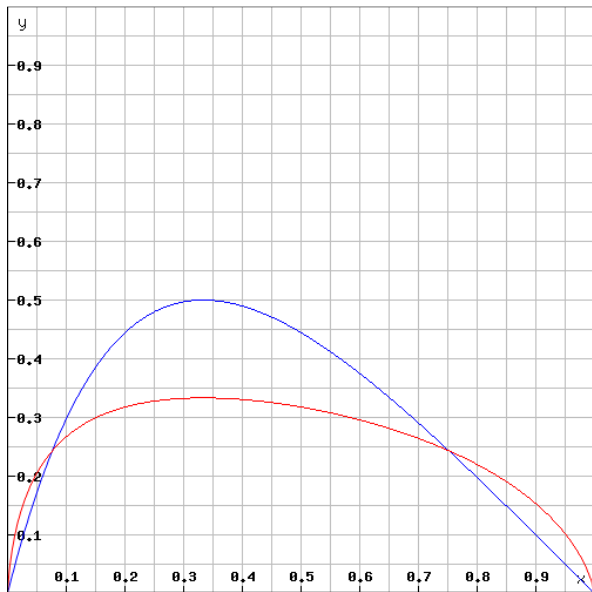

Figure 8. Total litigation expenditures, $C_p=1/2C_d$ (blue=all-or-nothing; red=proportional).

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