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Optimal Standards of Negligence when One Party is Uninformed

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Optimal standards of negligence when one party is uninformed of the standards

Preliminary version

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Abstract

How should a court set legal standards of negligence or performance when one party to a potential future tort or contract case will be uninformed about the standards set by the court? Since the court cannot affect the behavior of the uninformed party, it might set the standard for the informed party at that level which is optimal given the behavior that can be expected of the uninformed. Thus, if the court expects the uninformed to take more than optimal care, it might set a lower than first best standard for the informed party. However, there are circumstances in which the court should maintain the first best standard for the informed party, namely when the uninformed party understands the risk and realizes that the informed party has an incentive to take due care to avoid liability. The uninformed party will then expect to bear the loss himself and will take adequate precautions. Hence, in the oft-occurring situation where the informed party is the injurer and acts first, it can be possible to induce the first best outcome under the negligence rule; the negligence rule may then, due to its discontinuity, be superior to strict liability.

Maintaining the first best standard for the uninformed victim may, on the other hand, not be optimal; it is a weakly dominant strategy for the court to set a lower standard, since doing so will increase the informed party's incentive to take due care without affecting the behavior of the uninformed party.

When the conditions under which first best can (in theory) be realized are not met, as when it is not rational for the victim to believe that the injurer acts with due care, the task for the court is complicated by the fact that it may be optimal to either raise or lower the standard of due care for the informed party compared with the first best. As a further complication, which standards are optimal depend on whether the informed party is the victim or the injurer and on who acts first.

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1. Introduction

Courts often set standards of care in tort, contract or tort/contract boundary cases where one of the future parties to a similar dispute is more likely to be informed of the standards of due care (or of performance) than the other. In contractual settings, the seller is frequently a repeat actor, and hence likely to invest in information concerning legal standards, while the buyer takes part in the activity too rarely for the investment in information to be worthwhile². As examples of one-sided legal ignorance, banks tend to know legal standards concerning liability for faulty advice, while their customers tend to be ignorant about what level of care is required of them; insurance companies know about legal precedent whereas insurance clients know only little about what is required of them e.g. in terms of accuracy in reporting risk characteristics; employers tend to be better informed than employees concerning e.g. liability for workplace accidents, landlords are presumably on average better informed than tenants, and firms are often better informed about sales law or product liability than consumers. As an example, consider a case where a group of defrauded amateur investors sued a bank for not having warned them³. The investors had taken up a loan in the bank to buy into a project that turned out to be a scam, and while the bank was not involved in the fraud, the bank's name had been mentioned in the project in such a way that the investors could have inferred that the bank had lent its name and reputation to the project. It is apparent from the verdict that the court wished, on the one hand, to instruct future amateur investors that they must seek professional advice before embarking on a risky project. On the other hand, the court also wished to send a signal to banks that they must warn investors who might believe that a bank lends its reputation to a project.

When one of the parties to a tort or contract case is likely to be uninformed of the standards⁴, the court might consider that the behavior of the uninformed party (henceforth U or he) is beyond its influence, and attempt to influence only the behavior of the informed party (I or she). The court might then set the standard for I

² The empirical evidence indicates that people are often poorly informed of the law and of legal precedent; for a review of the evidence, see Ellickson (1991, pp 144-45).

³ The Danish Supreme Court, U.2000.577/2H.

⁴ It will be presumed throughout that the standards which the court should lay down when both parties are informed are those that when adhered to minimize total social cost, including the costs of care.

at that level which is optimal given the court's best guess concerning the behavior of U. That level may be either higher or lower than first best, since it is not certain that U will act with less care than he would if he knew the standard, and if care levels are complements a lower level of care by U should lead the court to require less of I, since I's care will then be less effective. However, deviating from the first best standard for I may not be optimal, if U realizes that I has an incentive to take due care; then, if U understands the existence of a risk, he should as the victim take proper precautions to lower his own loss. Requiring first best care by I will then induce the first best outcome.

Before embarking on the analysis, it may be worth being precise about the exact question under study and relate the main idea to existing literature.

Thus, it is worth noting that the issue analyzed in this article is not whether legal ignorance should be exculpatory⁵. The question is not whether existing standards should be interpreted in the light of a party's actual knowledge of the standards, but whether the standards themselves should from an ex-ante perspective be set differently when a future party is likely to be uninformed of the standards. The answer to this latter question might be that the standard for U should be raised compared with the first best; in fact when U can be expected to take more care than optimal the optimal response might be for the court to lower the standard for the *informed* party.

Also, the issue to be addressed is not identical to that of uncertainty concerning the law, at least not as uncertainty has traditionally been modeled since the first work by Craswell and Calfee (1986) and Shavell (1987). In the case of legal ignorance, but not in the case of uncertainty concerning the law, the probability distribution that U forms of the standard set by the court will be assumed here to be independent of the actual standard. When U's beliefs are independent of the actual standards, the standards cannot (directly) affect U's behavior, as they can when the probability distribution formed by U is assumed to lie around the actual standard, and to therefore shift with the actual standard.

As for existing literature, legal ignorance has not (to the best of my knowledge) received much attention within law and economics, despite its potential importance for the deterrent effect of legal regulation. However, two articles are directly relevant to the issue of optimal standards under one-sided legal ignorance:

Verkerke (2004) analyzes the issue of one-sided legal ignorance in the context of contract law, applying the idea of penalty default rules (Ayres and Gertner (2001)). The idea is that when only party (I) knows the contract law that governs their contractual relationship, the court can induce that party to communicate the applicable rule or standard to the other party (U) by establishing a default rule or

⁵ The issue of legal ignorance as exculpatory arises in Kaplow (1990).

standard that is both inefficient and to U's advantage. In order not to be bound by the inefficient default standards, I must then inform U of the standards that will apply instead. According to Verkerke, this principle is not only of theoretical interest but actually embedded in legal practice. For example, courts require organizers of dangerous activities to inform participants *in clear terms* when the organizers wish to waive liability for simple negligence, even though the efficient standard might well be gross negligence, which saves on litigation costs⁶. Verkerke maintains that by setting the simple negligence standard as the default standard, courts wish to force the organizer to inform the participant when the rule governing their relationship is that of gross negligence.

The idea of penalty default rules may perhaps be thought to solve every problem associated with one-sided legal ignorance, but communication of standards will not occur when the parties do not meet before the loss, and even when they do meet, communication may be rendered difficult by several factors. For example, if the organizer of a dangerous activity mentions to the participants that she will be liable only if grossly negligent, the participants might interpret this to mean that the activity is very dangerous or that she is irresponsible. Furthermore, it may be too complex and time consuming to communicate standards of due care⁷, and the communication of standards must be ex post verifiable to have any legal effect. Due to these factors, penalty default rules (or the simple requirement that I must inform U of the standards of due care) are not a universal remedy to one-sided ignorance, and do not pre-empt the present study of one-sided legal ignorance.

As the other existing work of direct relevance, *Kaplow* (1990) analyzes how sanctions should be set when some individuals are uncertain about whether one or another act is subject to sanctions. While not knowing which act is harmful and hence subject to sanction, the individual is assumed to know the size of the sanction, and the authorities can hence by changing the size of the sanction affect not only his or her incentive to undertake the act, but also his or her incentive to become informed of which act is harmful and subject to sanction. One insight from Kaplow's analysis is the natural one, that it may be optimal to increase the sanction when the individual under-estimates the probability that the act is in fact harmful (and vice-versa), and to

⁶ It may e.g. be important that the simple negligence standard can involve more costly litigation, since simple negligence is likely to be present more often than gross negligence.

⁷ Craswell (2004) emphasizes difficulties of regulating a duty to inform arising when more information is not always better or when information can be misleading rather than false.

raise the sanction when a higher sanction induces socially optimal investment in legal information⁸.

In distinction to the present analysis, Kaplow's concerns a situation where the authorities control a policy instrument that directly influences the individual's behavior, namely the size of the sanction. In the present context it seems implausible that the court could use the size of damages as an instrument to influence the behavior of U. In tort and contract law the sanction is (certainly in civil law systems) to a considerable extent tied to the size of the loss, and even when damages are either punitive or under-compensatory, U may be ignorant not only of the standard but also of the extent to which damages deviate from losses. For these reasons, it will be assumed that the authorities do not have a policy instrument by which they can directly affect U's behavior.

Finally, it should be mentioned that the present analysis of one-sided legal ignorance is relevant to the doctrine of 'last clear chance' (see e.g. Wittman (1982) and Shavell (1983))⁹. The doctrine concerns the tort or contract situation where one party acts first and fails to take due care; the doctrine then requires the second mover to eliminate the risk although doing so requires care that would not have been warranted if the first mover had acted with due care. This presents a trade-off between inducing the second mover to mitigate the risk, and inducing the first party to avoid creating the risk in the first place. The justification for the doctrine arises when there is some reason to expect the first mover to act without care. Thus, Wittman (1982) writes that the first mover may fail to act 'for some reason' (p. 73), while Shavell adds 'for some reason, such as the failure to perceive risk' (p. 591). In the present context, one might add a further possibility namely that the first mover is unaware of the negligence standards. Thus, while the last clear chance doctrine provides the person who acts first with inadequate incentives to prevent the risk from arising, that may not be important if the first mover is ignorant of standards, since the doctrine will then not affect his incentives. On the other hand, the doctrine will affect the incentives of an informed second mover in a desirable way, and so the present analysis provides a further justification for the doctrine in the case where the first mover is legally ignorant but the second mover may not be.

The following section introduces the model, while the third section analyzes which standards are optimal when I is the injurer and acts first. The fourth section analyzes the case where U is the injurer or U acts first, while the fifth section analyzes the case where U does not know that a risk exists. The sixth section analyzes whether holding I strictly liable is optimal. A discussion and a conclusion end the article.

⁸ This general issue of the incentive to become informed is also analysed in e.g. Kaplow and Shavell (1992)).

⁹ Again, I am grateful to a referee for this point.

2. The Model

The model can be informally described as follows. The court chooses a standard of due care for the injurer and possibly a standard of (comparative) negligence for the victim; these standards determine the pay-offs of the subsequent game played between I and U that will be known to I but not to U. When I acts first, U will attempt to infer whether I acts with due care. More precisely, U holds a belief concerning the standards set by the court which he updates with the observation of I's act of care; based on the ex-post belief U decides his level of care.

An outcome in the game between I and U is a perfect, Bayesian equilibrium when I responds optimally to the standards chosen by the court given the response function of U. U updates his beliefs about the standards according to Bayes' rule, upon observing I's act, and U responds optimally to I's act of care, given his updated belief.

An equilibrium in the overall game including the court's choice of standards arises when the standard chosen by the court minimizes total social costs of the resulting equilibrium in the game between I and U.

To describe the game in more formal terms, it will ease notation to assume that the parties can choose between only three levels of care. The structure of the model and the main analytical insights can be understood from this simple case, and it will be apparent how the formulation can be generalized to the case of n levels of care (and to the continuous case).

Thus, define the following notation:

$i = (\bar{y}, \bar{x})$: the set of standards for I and U, respectively. $i \in \{l, m, h\} \times \{l, m, h\}$

y^{fb}, x^{fb} : the first best levels of due care, i.e. the levels of care that minimize $y + x + p(y, x)L$

$y(i)$: The level of care exercised by I as a function of the standards of due care;

$y(i)$ maps $\{l, m, h\} \times \{l, m, h\}$ into $\{l, m, h\}$

$x(y)$: U's response function, i.e. U's level of care as a function of I's care; $x(y)$

maps $\{l, m, h\}$ into $\{l, m, h\}$

$\rho(i)$: U's prior probability distributions over the court's standards of care,

$i \in \{l, m, h\} \times \{l, m, h\}$, $\rho(i) \in (0, 1)$

$\eta(i, y)$: U's updated probability of the set of standards i , contingent on y

$p(y, x)$: the probability of loss given care by the two parties

L : the size of the loss

$f(y, x, i)$: the share of the loss born by I according to the comparative negligence rule when I exercises care at level y , U exercises care at level x , and the standards are i .

Note that $f = 0$ when I takes due care, and that $f = 1$ when U takes due care and I does not.

In the main part of the analysis, $p(y, x)$, $\rho(i)$, $f(y, x, i)$ and L are assumed to be common knowledge.

Bayesian updating is defined relative to I's equilibrium strategy, i.e. if the set of standards compatible with the observed act is κ , then for any set of standards $i \in \kappa$,

$$\eta(i, y) = \frac{\rho(i)}{\sum_{j \in \kappa} \rho(j)}. \text{ Furthermore, when I chooses a strategy that is not part of her}$$

equilibrium strategy, U will be allowed to form any out-of-equilibrium belief concerning the underlying standards (i.e. about the game played), except that I's standard of care must be at least as high as the level of care chosen by I. This restriction on the out-of-equilibrium beliefs is made for the sake of realism, as there is no reason for I to choose a higher level of care than required¹⁰.

The equilibrium conditions can now be defined as follows, where the asterisk * denotes equilibrium values.

A pure strategy equilibrium $(\bar{y}^*, \bar{x}^*, y^*(\bar{y}, \bar{x}), x^*(y), \eta^*)$ must fulfill:

1. The equilibrium beliefs $\eta^*(i, y)$, i.e. the probabilities which U attaches to the set of standards i when observing the act of care y by I, are formed according to Bayes' rule in the way just described
2. For each y , U's equilibrium response function $x^*(y)$ is given by the minimization of $x + \sum_i \eta^*(i, y)(1 - f(y, x, i))p(y, x)L$
3. For any $i = (\bar{y}, \bar{x})$, I's equilibrium function $y^*(\bar{y}, \bar{x})$ satisfies the following conditions:
 - 3a. When $\bar{y} < y + f(y, x^*(y), i)p(y, x^*(y))L$ for all $y < \bar{y}$, then $y^*(\bar{y}, \bar{x}) = \bar{y}$
 - 3b. Otherwise, $y^*(\bar{y}, \bar{x})$ is that lower y which minimizes $y + f(y, x^*(y), i)p(y, x^*(y))L$
4. The court chooses that (\bar{y}, \bar{x}) which minimizes $y^*(\bar{y}, \bar{x}) + x^*(y^*(\bar{y}, \bar{x})) + p(y^*(\bar{y}, \bar{x}), x^*(y^*(\bar{y}, \bar{x})))L$

3. Optimal standards of care when I is the injurer and acts first

¹⁰ Excluding the belief that I has chosen a higher level of care than the standard is consistent with various refinements of the perfect, Bayesian equilibrium, such as sequential equilibria (Kreps and Wilson (1982)).

It will first be shown that it is a weakly dominant strategy for the court to employ the simple negligence rule (without comparative negligence). In other words, it is weakly dominant to set $f = 1$, i.e. to let I bear the whole loss whenever I has been negligent, since this sharpens I's incentive without lowering U's, as by assumption U will not know the standard of comparative negligence.

Proposition 1

When the uninformed party is the victim and acts after the informed party, it is a (weakly) dominant strategy for the court to apply the simple negligence rule.

Proof: It will be shown that that if some level of care by I can be implemented under the comparative negligence rule that level can also be implemented under the simple negligence rule, leaving the care level of U unaffected (since U will not know whether the rule is that of simple or comparative negligence¹¹). Thus, it will first be shown that when it is optimal for I to adhere to the standard of due care under the rule of comparative negligence, it will also be optimal for I to adhere to the standard under the simple negligence rule, and then that when it is optimal for I to choose some level of care below the legal standard of due care under the comparative negligence rule, the level of care chosen by I can be implemented under the simple negligence rule by setting the standard equal to it. It will be assumed that U's reaction function will be the same under the simple negligence rule as under the comparative negligence rule, as U will not know which of the rules applies. Thus, consider first the case where I adheres to the standard under the comparative negligence rule with standards equal to (\bar{y}, \bar{x}) : If $y^* = \bar{y}$, i.e. if I adheres to the standard of due care, then for all $y < y^*$, $y^* < y + f(\bar{y}, \bar{x}, y, x^*(y))p(y, x^*(y))L$, since y^* is better for I than y . It will then also be the case that y^* is better than y under the simple negligence rule, since the condition then reads $y^* < y + p(y, x(y))L$, which must be fulfilled when the above inequality holds, since $f(\bar{y}, \bar{x}, y, x^*(y)) \leq 1$.

Second, if under the comparative negligence rule, the equilibrium choice of care, y^* , is less than the standard \bar{y} , then for all $y < y^*$:

$$y^* + f(\bar{y}, \bar{x}, y^*, x^*(y^*))p(y^*, x(y^*))L < y + f(\bar{y}, \bar{x}, y, x^*(y))p(y, x^*(y))L$$

¹¹ Note that U is assumed to know that the court employs the negligence rule, but not to know whether the rule is simple or comparative negligence. As justification, the negligence rule is a universal rule while the weighing of relative negligence varies between different kinds of activity, and can be difficult to know in any particular area of activity.

given that y^* is preferred to y . If the standard of due care is then set equal to y^* under the simple negligence rule, y^* will still be preferred to any $y < y^*$, since under the simple negligence rule, the condition becomes $y^* < y + p(y, x^*(y))L$, which is fulfilled when the above inequality holds, since $f(\bar{y}, \bar{x}, y^*, x^*(y^*))p(y^*, x^*(y^*))L > 0$ and $f(\bar{y}, \bar{x}, y, x^*(y))p(y, x^*(y))L < p(y, x^*(y))L$. Thus, if I can be induced to take some level of care under the comparative negligence rule, I can also be induced to take that level of care under the simple negligence rule (perhaps with a change in the standard of due care), and since the response by U can be assumed to be unaffected, any outcome that can be implemented under the comparative negligence rule can also be implemented under the simple negligence rule. QED.

Intuitively, the simple negligence rule is 'more discontinuous' than the comparative negligence rule, and hence provides better incentives for I. Note that the proposition does not require U to understand the size of the risk, which strengthens the result. The question arises, however, whether the simple negligence rule ever strictly dominates the comparative negligence rule. This can occur but it requires restrictive assumptions in the present model. Thus, it can only occur when I expects U to take less than due care (since the difference between the two rules arises only when U takes too little care), *and* when the expected sharing of the loss with U under the comparative negligence rule induces I to take less than due care even though taking due care would eliminate I's liability altogether. However, the assumptions need only to be altered slightly for this to be a real possibility. For example, it may be the case that only a fraction of the uninformed individuals raise claims in which case it might be important for I's incentive to take due care that she bears the full cost whenever a claim is raised and she is found negligent. Hence, the finding that the simple negligence rule strengthens I's incentive without affecting the incentives of U does seem worth emphasizing.

Since the simple negligence rule weakly dominates the comparative negligence we can restrict attention in the following to the former, which is analytically easier to handle. The analytical results hold also hold but are more difficult to prove under the latter rule.

A sufficient condition will now be derived under which the court should, under the simple negligence rule, set the standard for I at the first best level. The condition is that U must not eliminate too much of the risk when he believes I has adhered to the standard of due care. In the proposition, $\tilde{x}(y)$ denotes U's response when he believes that I has acted with due care, i.e. $\tilde{x}(y)$ minimizes $x + p(y, x)L$ with respect to x .

Proposition 2

When I is the injurer and acts first, and U understands the risk and the possibilities for mitigating it, a sufficient condition for it to be optimal for the court to maintain the first best standard y^{fb} for the informed party is that $y^{fb} < y + p(y, \tilde{x}(y))L$ for $y < y^{fb}$.

Proof: The idea of the proof is that when the court sets standard at the first best level y^{fb} , and $y^{fb} < y + p(y, \tilde{x}(y))L$ for $y < y^{fb}$, then the only equilibrium in the game between I and U is that where I chooses to take due care. To prove this by contradiction, consider the possibility that the court sets the standard at y^{fb} , and that an equilibrium where $y < y^{fb}$ then arises in the game between I and U. Two possibilities then arise. Either U believes the standard is y or U believes that the standard is higher than y (U can safely exclude that I has chosen a higher level of care than the standard). If U believes that the standard equals y , i.e. that I has taken due care, U will respond by $\tilde{x}(y)$, and the total cost to I will then be $y + p(y, \tilde{x}(y))L$. This is higher than the cost of exercising first best care when the condition of the proposition: $y^{fb} < y + p(y, \tilde{x}(y))L$ is fulfilled. If U believes the standard for I is higher than y , i.e. if U expects I to be liable, U will take a level of care that cannot be higher than $\tilde{x}(y)$, since U expects I to bear part of the loss, and $\tilde{x}(y)$ is U's response when U expects to bear the whole loss. If U takes care at level $x' \leq \tilde{x}(y)$, then $y + p(y, x')L \geq y + p(y, \tilde{x}(y))L$, in which case $y^{fb} < y + p(y, x')L$ when $y^{fb} < y + p(y, \tilde{x}(y))L$. Again, it is then better for I to choose y^{fb} . This contradicts that there is an equilibrium where I chooses $y < y^{fb}$ when $y^{fb} < y + p(y, \tilde{x}(y))L$ for $y < y^{fb}$. QED.

Note that the condition is sufficient but not necessary, and that it may well be optimal to set first best standards also when the condition is not fulfilled. For example, when I's choice of care is dichotomous, it will never be optimal for the court to set a different standard for I than the first best, as can be seen by simply noting that if the first best is the lower of the two possible care levels, it can be realized by requiring only low care by I, and if first best is the higher of the two it will never be strictly better to require only a low level of care (which for sure will not implement high care by I).

It will now be shown that when the sufficient condition is not fulfilled, it can be challenging for the court to set the standard for I, as there are circumstances in which

the court should lower the standard for I compared with the first best standard, and other circumstances in which the court should raise the standard compared with first best.

Proposition 3

When the informed party is the injurer and acts first, and when the uninformed party knows the size of the risk and the condition of proposition 2 is not fulfilled, it can be optimal for the court to set a lower or- under different circumstances- a higher standard than the first best for the informed party.

Proof: See Appendix A

The logic can be explained as follows. It can, on the one hand, be optimal for the court to set a lower than first standard of due care when U expects the standard for I to be lower than first best. The point is that if the court sets the standard at the first best, I might take advantage of U's belief and exercise that lower level of care which U expects, whereas if the court set the standard at a lower level, namely in between the first best standard and what U expects, I might wish to adhere to the standard set by the court rather than take that lower level of care which U expects. On the other hand, it can be optimal to set a higher standard than the first best when U expects that the standard is higher than first best, for if the standard is then set equal to the first best, U might respond with too little care, expecting I to be liable. If the standard is then raised, I might still adhere to the higher standard, and U will then take adequate precautions because U will not think that I will be liable.

Naturally, these possibilities do not appear particularly realistic. But the point of the proposition is not so much to derive realistic patterns of behavior but to show that we cannot know whether a court should raise or lower the standard of due care for I when she acts first as the injurer and the conditions of proposition 2 are not met. It will depend on U's beliefs, about which the court is likely to have very little information. The result calls for caution on the part of the court; an activist role might be more justified if it were clear in which direction the court should deviate from the first best standard.

Summing up the main conclusions, it will tend to be optimal for the court to apply the simple negligence rule, and to set the standard for I at the first best level, when I is the injurer and acts first, and U understands the risk. However, when U will not find it credible that I will take due care, it may be optimal to deviate from the first best standard. The task for the court is rendered difficult by the fact that whether the court should raise or lower standard for I will depend on U's beliefs, which the court may have difficulty ascertaining.

4. I is the victim or acts after U

The case will now be analyzed where I is the victim and acts first, i.e. where U is the injurer and can perhaps obtain information concerning standards by observing I's act. To formulate the equilibrium conditions for this case, denote by $\tilde{f}(y, x, i)$ the share of the loss born by I when the standards are i , and the choices of care are y and x , by I and U, respectively. Naturally, this function is different than the f function above, since the negligence rule distinguishes between the injurer and the victim. The definition of the pure strategy equilibrium will be somewhat different from that given above. Thus, $(\bar{y}^*, \bar{x}^*, y^*(\bar{y}, \bar{x}), x^*(y), \eta^*)$ is an equilibrium when:

1. The equilibrium beliefs $\eta^*(i, y)$, i.e. the probabilities which U attaches to the set of standards i when observing the act of care y by I, are formed according to Bayes' rule in the same way as above
2. For each y , U's equilibrium response function $x^*(y)$ is given by the minimization of $x + \sum_i \eta^*(i, y)(1 - \tilde{f}(y, x, i))p(y, x)L$
3. For any $i = (\bar{y}, \bar{x})$, I's equilibrium function $y^*(\bar{y}, \bar{x})$ minimizes $y + \tilde{f}(y, x^*(y), i)p(y, x^*(y))L$
4. The court chooses that (\bar{y}, \bar{x}) which minimizes $y^*(\bar{y}, \bar{x}) + x^*(y^*(\bar{y}, \bar{x})) + p(y^*(\bar{y}, \bar{x}), x^*(y^*))L$

The most notable difference to the case where I is the injurer is that the court may have much less leverage over the parties' acts, since the main weapon in the hands of the court is the discontinuity of the pay-off function of the injurer under the negligence rule, and this weapon is stronger when the injurer can observe its use. For example, U may take too much care as the injurer when he is uncertain about the standards, and I may take advantage of this uncertainty on the part of U without the court being able to intervene. Consider for illustration the game below, where care levels equal costs of care (the cost of care is one unit for both

x y	1	0
1	.5	1.1
0	1.25	2.5

parties) and entries denote expected costs of accidents. As before, I chooses y and U chooses x . The first best outcome is for I but not for U to take care, i.e. $(y, x) = (1, 0)$, where total costs equal 2.1. Note that the condition of proposition 2 is fulfilled for I as the injurer, since $y^{fb} < y + p(y, x(y))L$ for $y < y^{fb}$ ($1 < 1.25$), which means that the first best would be implementable by the court by setting first best standards if I were the injurer. However, when I is the victim, it may as mentioned be impossible for the court to have any effect on the possibly suboptimal outcome. Thus, assume that U believes ex ante that care is required of him. i.e. that the standard \bar{x} is 1 and that no care is required of I, i.e. $\bar{y} = 1$. It will then be an equilibrium for I (who is assumed to be aware of U's belief) to choose no care and for U to choose care. Observing no care by I will confirm U's erroneous belief that he is the liable party, and the incentive for I to take advantage of U's wrong belief will not, as when I is the injurer, be curtailed by the discontinuity of the negligence rule. Note however, that this example does not establish an argument for the court to deviate from first best standards, since in the example first best standards will bring about the same outcome as any other standards. The question then arises whether there might be a rationale for the court to deviate from the first best standard, either for I or for U (when I is the victim and acts first). It turns out that the situation is similar to that studied in Appendix A, where it was shown that it can be optimal for the court to set either a higher or a lower standard for I when I is the injurer and the discontinuity of the negligence rule does not play a decisive role. Similar effects can be construed here where the court in subtle ways takes into account the initial beliefs by U; since such subtle effects do not seem particularly realistic, the issue will not be pursued further here. But it follows from the existence of these subtle effects that one cannot conclude that the court should avoid holding U liable in order to induce as much care by I as possible (as above where the simple negligence rule was optimal). To see that this may not be optimal note that if I attempts to increase U's level of care by taking less care, that may be optimal if U is never liable, namely when U responds by strongly increasing his level of care when I lowers her's. However, if U by increasing his level of care escapes liability, it may not be optimal for I to induce this increase in U's level of care.

5. When U does not realize the existence or the size of a risk

In many real world instances, legal ignorance is combined with ignorance of the existence or the size of the risk. That it would be wrong for the court to assume that U will then take proper precautions can be seen from the following real world example¹². A museum had placed a piece of art unprotected in the center of a room,

¹² The case is U 1978.399Ø .

creating a risk that visitors would step on it. While the set-up could be considered negligent, stepping on the piece of art could (alternatively or at the same time) also be so considered, as most people would be aware of the piece of art and take care to avoid it. Standards laid down by the court would be more likely to be known by museums as few museum visitors would learn about the verdict. Moreover, it seems realistic to assume that most visitors will not consider the possibility of a loss at all and will not enter into the kind of considerations analyzed above. The more realistic assumption would hence seem to be that visitors' level of care is exogenous, and that for some visitors, the level of care will probably be too low. Hence, the court should consider whether the placement of the piece of art was negligent given the level of care that one can realistically expect from (unthinking) visitors. The idea that U will derive information from the act of I is not relevant in this or in many other cases where the uninformed party does not realize the existence of a risk. The case mentioned above of the amateur investors who lost money on a fraudulent project is actually also of this nature; it is essentially a duty to warn case, and if the bank did not warn, the investors would have no reason to change their initial belief that the bank's reputation was at stake.

A different situation occurs when U is aware of the existence of a risk but does not know the size of the risk. The court should then consider whether it can induce I to act in such a way that U becomes aware of the true size of the risk. Three general points are worth making in this regard; they will be mentioned only briefly as the main issue here is not asymmetry of information concerning risk but ignorance of legal standards¹³. First, it is conceivable that if the court requires the first best level of care by I, it will be optimal for I to take due care, and that this will inform U of the size of the risk, in which case U may respond by taking first care. Thus, ignorance of the size of risk does not necessarily call for a different standard than the first best. Second, however, one can imagine situations where it is optimal for the court to inform U of the size of the risk by requiring a different standard of care by I than the first best. Thus, imagine the situation where both parties either take care or not, and where the first best level is for U but not for I to take care. If I does not take care, U will, however, not know that the risk is large, and so first best cannot be implemented (assuming that I cannot be required to warn U). If, on the other hand, I takes care, U can infer that the risk must be large and U will then also take care, and if care by both parties is then socially preferable to no care by both parties, the court should optimally require care by I although this may not be the first best standard. Third, it is very likely that U will not become aware of the exact size of the risk by observing I's level of care. To illustrate, if the size of the possible loss is a continuous variable and I's choice of care is discrete, I's choice of care cannot be fully

¹³ Proofs can be had on request from the author.

informative¹⁴. Thus, U's response is likely to reflect his ignorance of the size of the risk, and so the court should in principle take into consideration U's likely misperception of the risk.

6. Strict liability

On the background that it will tend to be optimal for the court not to hold U comparatively negligent, i.e. that it will be (weakly) optimal to let I bear the whole loss when negligent, one may wonder whether strict liability is optimal under one-sided legal ignorance.

Consider first the case where U is aware of the general nature of the rule, whether the rule is negligence with or without comparative negligence, or strict liability with or without contributory negligence, but where U does not know the standards of negligence. In this case, if U knows the rule to be strict liability without contributory negligence, U will lack that incentive to take care which the negligence rule provides, whereas if U knows the rule to be strict liability with contributory negligence, U will have to know the standard of contributory negligence to be able to make the correct decision. Thus, while U may take adequate care under the negligence rule without knowing any legal standards, when the rule is strict liability with contributory negligence, U will choose incorrectly if he misperceives the standard of contributory negligence. In general, one might assume U to take too much care, for the reason already mentioned that an injurer who is uncertain of the negligence standard will be likely to take too much care.

Consider, second, the case where U's level of ignorance of the rule is such that U's response function $x(y)$ can be considered exogenous. In this case the simple negligence rule, which as shown above weakly dominates the comparative negligence rule, can do better than strict liability with or without contributory negligence. Thus, consider the level of care \hat{y} , which minimizes $y + x(y) + p(y, x(y))L$, given the response function $x(y)$. If the court sets the standard of negligence as \hat{y} , and a similar condition as that of Proposition 2 is fulfilled, namely that there does not exist another $y < \hat{y}$ such that $\hat{y} > y + p(y, x(y))L$, then it is apparent from the logic of Proposition 2, that the second best level of care by I, \hat{y} , can be implemented through the simple negligence rule. This is the best that can be hoped for when U's response function is exogenous. On the other hand, \hat{y} will not be implemented under the rule of strict liability, since I will choose that level of care which minimizes $y + p(y, x(y))L$, i.e. I will not take U's costs of care into consideration. On the other hand, I's criterion will be closely aligned with the social criterion, when $x(y)$ is nearly constant, in which case strict liability will almost realize the second best

¹⁴ I am grateful to a referee for this point.

outcome. Moreover, for reasons that are well appreciated, strict liability will often make better use of information possessed by I; when e.g. the U's degree of ignorance is better known to I than to the court, i.e. when I knows the response function of individual U better than the court does, the negligence standard will be set incorrectly, while I will approximately take adequate care when U's cost of care is not very variable as a function of I's care.

In conclusion, strict liability may or may not do better than negligence depending on the circumstances.

7. Discussion

Three remarks will be made.

First, the assumption made in the analysis that U will become informed of standards after the loss has occurred can be justified to some extent by the incentive which U has to find about the legal status of his claim once he has suffered a loss, but naturally it can be too costly also ex post, and one presumes that many claims are never raised, because U is reluctant to waste money on a claim that may turn out to be without value. Thus, it is worth considering how conclusions change when only a fraction of victims raise claims. It may then remain optimal for I to act with due care, since taking due care eliminates all claims, and since the claims that are raised may be costly both in terms of administrative cost and in terms of reputation. However, when so few claims are raised that it becomes inoptimal for the informed party to take due care at the first best level, one possibility is for the court to lower the standard for I. It may be that the number of claims raised can sustain a lower than first best standard of due care. In any case, when only few claims are raised, this can be a reason for the court not to attach importance to U's comparative negligence; employing the simple negligence rule may compensate for the dearth of claims in providing incentives for I. Thus, the possibility that U will often not raise a valid claim, can strengthen the case for the simple negligence rule under one-sided legal ignorance.

As the second remark, it can sometimes be clear from conventional fairness reasoning or from the logic of cost minimization what both parties ought to do to avoid an accident. Even though one party may not know the legal standard, he should realize that he is required to take care, and it can be viewed as the role of courts to uphold efficient rather than subvert norms of this kind. Two comments will be made in this regard: First, the reasonable or efficient norm will only be undermined by a court verdict that contradicts it, if people learn about the verdict. The important question then becomes how many people hear about legal verdicts of the given kind. In reality, the legal system often does not sustain efficient norms, and one wonders how many

people realize this to be the case¹⁵. In general, ordinary citizens tend to know very little about how the legal system operates¹⁶. Furthermore, it is often not clear which standards sustain appropriate norms; this is often a question of judgment, of weighing disparate set of costs, and when the weighing is less obvious, the potential impact on norms is likely to be less strong. However, to this must be added that when fairness is a real concern, there will be a cost of unfairness to the injurer when the court lowers the standard for the victim in order to induce future injurers to take due care; this concern should then of course be weighed against the incentive arguments analyzed in this article. In conclusion it would seem that the arguments concerning fairness norms strengthen the rationale for the court to maintain first best standards despite the presence of one-sided legal ignorance.

As the third remark, it may be that the present analysis has overestimated people's knowledge of the legal system. Some people do not know the nature of the negligence rule and hence will not draw the kind of inferences that have been assumed in part of the analysis. However, when U is the victim, acts after I, and knows the risk, he should take appropriate care whenever he does not expect to be able to hold I liable. It seems realistic to assume that people who are very ignorant of the workings of the legal system will tend not to expect to be able to sue the more professional counterpart, and the result that the standard for I should be set at the first best level will then still hold under the circumstances mentioned.

8. Conclusion

The analysis has considered the oft-occurring situation, where only the professional party to a (potential) contract or tort (or contract/tort boundary) case is informed of legal standards. When setting standards of due care in such cases, the court might realize that it cannot affect the behavior of the uninformed party, and so set the standard for the informed party at that level which minimizes the cost given the most likely behavior by the uninformed party. However, when the uninformed is the victim, can observe the level of care by the informed, and is aware of the size of the risk, the uninformed should take adequate precautions to lower the risk. Under these circumstances, it can be optimal for the court to set the standard for the informed party at the first best level. On the other hand, it may well be optimal for the court to lower the standard of due care for the uninformed as this has no effect on the behavior of the uninformed (assuming that no uninformed party learns about the

¹⁵ Few Danes know for example that Danish tort law excludes the victim from raising a claim when the victim has taken out insurance (unless the injurer acts professionally or with gross negligence).

¹⁶ See

standards) while increasing the incentive for the informed to adhere to the standard of due care.

When the uninformed is the victim rather than the injurer, when the uninformed acts before or at the same time as the informed, or when the uninformed is either also unaware of the existence or the size of the risk, it is no longer reasonable to assume that U will take optimal care, and the court should then set standards for the informed based on an estimation of which act by the uninformed is realistic to expect (which will depend on which beliefs the uninformed is most likely to entertain).

Finally, holding the informed party strictly liable can be optimal, since it takes advantage of the informed party's likely superior knowledge concerning U's beliefs, but when I acts first as the injurer, and U knows the risk, first best cannot generally be achieved by strict liability, since the informed party will not take the uninformed party's cost of care into account when deciding her level of care.

Appendix A

Proof of proposition 3, that it may be optimal either to lower the standard or to raise it compared with first best.

First, an example can illustrate that it may be optimal for the court to lower the standard. In the example, if the court sets the standard of due care high, I will be tempted to take low care, since U will respond to low care by eliminating a large part of the risk (believing that the standard may well be low). When, on the other hand, the court chooses the medium level of care as the standard for I, the temptation for I to deceive U is lower, and so at medium care, I will wish to avoid liability by adhering to the standard. Thus, consider the game shown in table 1 below where the informed party chooses between three levels of care (as parametrized by the cost of exercising that level of care), and the uninformed between only two levels of care. The entries in the table are the expected losses resulting from the alternative care levels by the two parties. Let the cost of high and low care be the same for the two parties, namely 1 and 0, and let the cost of medium care be $\frac{1}{2}$ for the informed party.

y \ x	1	0
1	0	3/4
1/2	0.6	1.28
0	0.8	3

The first best outcome is for I to exercise 1 and for U to exercise 0. The total cost is then 1.75 which can be readily verified as the lowest attainable. However, if the standard for I is set at 1, I will choose 0 and U will respond by 1, given that U attaches a high probability ex ante to the standard for I being 0. The equilibrium is then the following:

$$y^*(1) = 0$$

$$y^*(\frac{1}{2}) = \frac{1}{2}$$

$$y^*(0) = 0$$

$$x^*(y=1) = 0$$

$$x^*(y=\frac{1}{2}) = 0$$

$$x^*(y=0) = 1$$

To verify that this an equilibrium, consider first the responses by U:

When $y = 1$, U must form an out-of-equilibrium belief. As mentioned above, the only reasonable belief is that the standard is high, i.e. equal to 1, since I will only take care at level 1 if the standard is 1. If the standard is 1, U will minimize his cost by choosing 0, since $3/4 < 1$.

When $y = \frac{1}{2}$, the standard must be $\frac{1}{2}$, since this level of care is chosen only when the standard is $\frac{1}{2}$. Care level 0 then minimizes U's cost. When $y = 0$, the standard is either 1 or 0. If it is 1, costs to U are 1 from choosing 1 and 0 from choosing 0. If the standard is 0, costs to U are: $1 + 0.8$ from choosing 1 and 3 from choosing 0.

The ex-post probability, $\eta(0)$, of the standard being 0 is: $\frac{\rho(0)}{\rho(0) + \rho(1)}$ while the

probability is $\frac{\rho(1)}{\rho(0) + \rho(1)}$ that the standard is 1.

Hence, the expected cost for U of choosing 1 is $\frac{\rho(1)}{\rho(0) + \rho(1)} \times 1 + \frac{\rho(0)}{\rho(0) + \rho(1)} (1 + 0.8)$

while the expected cost from choosing 0 is $\frac{\rho(1)}{\rho(0) + \rho(1)} \times 0 + \frac{\rho(0)}{\rho(0) + \rho(1)} 3$. Hence,

the expected cost from choosing 1 is smallest when $\frac{\rho(1)}{\rho(0)} < 1.2$. When this latter

condition is fulfilled, it is optimal for I to choose 0 rather than 1, since the cost of 0.8 is lower than the cost of exercising 1. It is then optimal for the court to choose the standard $\frac{1}{2}$ rather than the first best standard 1, since the total social cost 1.78 is

lower for the standard $\frac{1}{2}$ than the total cost 1.8 for the standard 1 (which leads to I choosing 0 and U choosing 1). QED.

It may be optimal for the court to raise the standard compared with first best

Again, an example will suffice. Consider the following expected losses arising from alternative care level (parametrized by costs of care):

	2	1	0
3	0	$\frac{1}{2}$	1
1	$\frac{1}{4}$	$\frac{5}{6}$	$\frac{7}{4}$
0	$\frac{1}{2}$	2	10

The first best is for I to take low care ($=0$) and for U to take high care ($=2$), i.e. the first best outcome is $((y, x) = (0, 2))$, since no other combination of care levels achieves a total cost less than $2\frac{1}{2}$. However, when U's ex-ante belief satisfies the following condition, $2\rho(3) > \rho(0) > \rho(3)/7$, the equilibrium strategies for I are:

$y^*(3) = 0; y^*(1) = 1; y^*(0) = 0$, and for U: $(x^*(y=3) = 0; x^*(y=1) = 0; x^*(y=0) = 1)$.

To verify that these are equilibrium strategies consider first U's response to I's act of 0:

Given that I chooses 0 both when the standard is 3 and when it is 0, Bayesian updating implies that the ex post probability of the standard being 3 when the level of care is 0 equals $\frac{\rho(3)}{\rho(3) + \rho(0)}$ while the probability that it is 0 equals $\frac{\rho(0)}{\rho(3) + \rho(0)}$.

Given these probabilities, the costs to U of choosing either 2, 1 or 0 can now be compared. The cost to U of choosing 2 equals $\frac{\rho(3)}{\rho(3) + \rho(0)} \times 2 + \frac{\rho(0)}{\rho(3) + \rho(0)} (2 + \frac{1}{2})$

The cost of choosing 1 equals

$$\frac{\rho(3)}{\rho(3) + \rho(0)} \times 1 + \frac{\rho(0)}{\rho(3) + \rho(0)} (1 + 2)$$

The cost of choosing 0 equals

$$\frac{\rho(3)}{\rho(3) + \rho(0)} \times 0 + \frac{\rho(0)}{\rho(3) + \rho(0)} (0 + 10)$$

Hence, the choice 1 is preferred to 2 when:

$$\frac{\rho(3)}{\rho(3) + \rho(0)} \times 2 + \frac{\rho(0)}{\rho(3) + \rho(0)} (2 + \frac{1}{2}) >$$

$$\frac{\rho(3)}{\rho(3) + \rho(0)} \times 1 + \frac{\rho(0)}{\rho(3) + \rho(0)} (1 + 2), \text{ hence when } 2\rho(3) > \rho(0).$$

The choice 1 is preferred to 0 when

$$\frac{\rho(3)}{\rho(3) + \rho(0)} \times 0 + \frac{\rho(0)}{\rho(3) + \rho(0)} \times 10 >$$

$$\frac{\rho(3)}{\rho(3) + \rho(0)} \times 1 + \frac{\rho(0)}{\rho(3) + \rho(0)} (1 + 2)$$

i.e when $7\rho(0) > \rho(3)$.

Thus, U will respond to 0 by 1, when $2\rho(3) > \rho(0) > \rho(3)/7$.

Consider, next, U's response to 1. If I chooses 1, U can infer that this must be the standard (since 1 is only chosen by I when 1 is the standard), and U will hence choose 0 which minimizes his total costs. Finally, if I chooses 3, the optimal choice for U is clearly 0, since U will realize that the standard must be 3 and that U will hence carry the loss; the loss of 2 is then the lowest achievable.

Consider, in turn, the strategy by I when the response function of U is as just derived. Three possibilities should be compared under the assumption that

$2\rho(3) > \rho(0) > \rho(3)/7$, when U will respond as just indicated:

When the standard is 3, it is better for I to choose 0 than 3, since the response to 0 will be 1 imposing a total cost of 2 on I, while the response to 3 will be 0, imposing a total cost of 3 on I. It is also better for I to choose 0 than 1, since the total cost to 1 is $2\frac{3}{4}$ while the total cost to 0 is 2.

When the standard is 1, it is better for I to choose 1 than 0, since when 1 is the standard, the cost of choosing 1 is 1 while the cost of choosing 0 is 2, since the response to 0 is 1.

When the standard is 0, I will choose 0, since there is no reason to choose a higher level of care than the standard.

This verifies the stated equilibrium in the game between I and U. It remains to be shown that it is optimal for the court to choose the standard 1. This standard leads to the outcome where I chooses 1 and U chooses 0 with a total social cost of $2\frac{3}{4}$. If the

court chooses the standard 3, the outcome will be that I will choose 0 and U will choose 1 with a total social cost of 3. If the court chooses the standard 0, I will choose 0 and U will choose 1 as when the standard is 3, and total social cost will again be 3. Thus, total social cost is lowest when the standard is 1, while the optimal standard is for I to choose 0, which demonstrates by example that it can be optimal for the court to choose a higher standard than the optimal. QED.

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