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The Incentive Effects of Settlements under Joint and Several Liability

by

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Abstract

The paper analyzes how the "settlement effect" of joint and several liability influences *ex ante* incentives to exercise care. It is well recognized in the literature that a plaintiff can extract an amount in settlements from jointly and severally liable injurers under a pro tanto set-off rule that exceeds the expected recovery to a plaintiff from litigation. The resulting increase in expected liability -- the "settlement effect" -- will in turn affect the primary behavior of injurers. This settlement effect is peculiar to joint and several liability with pro tanto set-off and is not present in other liability regimes for multiple injurers, such as non-joint liability or joint liability subject to proportional set-off.

Even though the settlement effect will always result in increased expected liability, it can either increase or decrease *ex ante* incentives to exercise care as it may either increase or decrease marginal changes in expected liability. More precisely, the effect of incentives depends on the nature of uncertainty over injurers' liability. If the cause for uncertainty lies in uncertainty over the level of due care, the settlement effect pushes incentives to exercise care to the extremes: it increases incentives for high level of care and decreases incentives for low levels of care. If uncertainty results from issues independent of injurers' level of care, the settlement effect always increases incentives to exercise care.

The complexity of the effects on primary behavior, and the difficulty of predicting the direction of these effects in practice, detract from the usefulness of using joint and several liability with a pro tanto set-off rule as a policy instrument. Instead, one should consider replacing it with non-joint liability or with joint liability subject to proportional set-off, which do not produce similar settlement effects.

Several recent articles have examined the effects of joint and several liability on settlement.[1] But these settlement effects also have a significant impact on primary behavior.[2] This Note will examine these effects under the most frequently analyzed paradigm of joint and several liability, in which plaintiff's probabilities of success against the defendants are perfectly correlated and any settlements are applied to future awards under a pro tanto set-off rule (i.e., the award is reduced by the amount of the settlement).

Part I will present the basic model of settlement under joint and several liability. Part II will draw the implications of settlement on primary behavior. As others have noted, the settlement effects of joint and several liability increase the expected recovery to plaintiff, and thus the expected damages

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[1] Lewis A. Kornhauser & Richard L. Revesz, Multidefendant Settlements under Joint and Several Liability: The Effect of Insolvency, 43 J. Legal. Stud. 517 (1994) (hereinafter Multidefendant Settlements I); Lewis A. Kornhauser & Richard L. Revesz, Multidefendant Settlements: The Impact of Joint and Several Liability, 43 J. Legal Stud. 41 (1994) (hereinafter Multidefendant Settlements II); Lewis A. Kornhauser & Richard L. Revesz, Settlements under Joint and Several Liability, 68 N.Y.U. L. Rev. 427 (1993) (hereinafter Multidefendant Settlements III); Frank H. Easterbrook, William M. Landes & Richard A. Posner, Contribution Among Antitrust Defendants: A Legal and Economic Analysis, 23 J.L. & Econ. 331 (1980); A. Mitchell Polinsky & Steven Shavell, Contribution and Claim Reduction Among Antitrust Defendants: An Economic Analysis, 33 Stan. L. Rev. 447 (1981).

[2] See Kathryn E. Spier, A Note on Joint and Several Liability: Insolvency, Settlement, and Incentives, 43 J. Legal Stud. 559 (1994). The deterrence effects of joint and several liability as such have been analyzed in Lewis A. Kornhauser & Richard L. Revesz, Apportioning Damages Among Potentially Insolvent Actors, 19 J. Legal Stud. 617 (1990); Lewis A. Kornhauser & Richard L. Revesz, Sharing Damages Among Multiple Tortfeasors, 98 Yale L.J. 831 (1989); Easterbrook et al., Contribution Among Antitrust Defendants: A Legal and Economic Analysis, supra note 1; and Polinsky & Shavell, Contribution and Claim Reduction Among Antitrust Defendants: An Economic Analysis, supra note 1. These articles, however, do not analyze the specific deterrence effects created by the impact on settlement.

payable by defendants.[3] However, this does not mean that they increase defendants' incentive to take care ex ante. Rather, as this Note will show, the settlement effects of joint and several liability can either increase or decrease incentives to exercise care, depending on the nature of the uncertainty regarding defendants' liability and on the level of care.

I. Model

Let $n \geq 1$ be the number of defendants, all of which bear an equal share of damages in case of litigation. Neither plaintiff not defendants incur any litigation costs and all parties are risk-neutral. Let $p(x)$ be the probability that a defendant will be found liable (conditional on an accident occurring) if the case is litigated, with x signifying the level of care exercised by defendants before an accident occurs and $p' \leq 0$. $p(x)$ is equal and perfectly correlated across defendants. Let $D(x) > 0$ be the expected amount of damages defendants are jointly and severally liable for (if found liable), with $D' \leq 0$. Each defendant bears an equal share of the damage award, defendants are infinitely solvent, and the values of p and D are known.

It follows that if no defendant settles, each defendant faces an expected liability of pD/n, and plaintiff's expected recovery is pD. I will refer to the latter amount as the base

[3] See, e.g., Kornhauser & Revesz, Multidefendant Settlements II, supra note 1; Kornhauser & Revesz, Multidefendant Settlements III, supra note 1; Easterbrook, Landes & Posner, Contribution Among Antitrust Defendants: A Legal and Economic Analysis, supra note 1; and Polinsky & Shavell, Contribution and Claim Reduction Among Antitrust Defendants: An Economic Analysis, supra note 1.

damages amount. The base damages amount would be the only equilibrium settlement amount (and the expected outcome of litigation) if each defendant were non-jointly liable for damages of D/n or if settlements resulted in set-off under a proportional set-off rule (where each settlement reduces the potential liability of non-settling defendants by D/n).

Instead of litigating, parties may settle the claim. In such case, plaintiff makes settlement offers to all defendants and the defendants decide simultaneously whether or not to accept the offers. Costs of coordination are sufficiently high that defendants act non-cooperatively. As noted above, plaintiff's probabilities of success are perfectly correlated and any settlements are applied to future awards under a pro tanto set-off rule. As others have shown, the Nash equilibrium settlement solution has plaintiff offer, and each defendant accept, a settlement in the amount of $pD\{1/[1+p(n-1)]\}$, with a total recovery of $pD\{n/[1+p(n-1)]\}$.[4] I will refer to the latter amount as the joint and several damages amount. The difference between the joint and several damages amount and the base damages amount represents the "settlement effect" of joint and several liability under a pro-tanto set-off rule *compared to* the multiple defendant case under non-joint liability or under a proportional set-off rule. The analysis thus abstracts from the effects on

[4] See Kornhauser & Revesz, Multidefendant Settlements II, at 62, 67-71; Kornhauser & Revesz, Multidefendant Settlements III, at 456, note 113; Spier, supra note 2, at 562; Polinsky & Shavell, supra note 1, at 470; Easterbrook et al., supra note 1, at 356-360.

expected settlements that result from the fact that multiple defendants, rather than a single defendant, are potentially liable.

The model applies most directly to the liability of injurers who take a joint action or omission that causes harm, such as the liability of partners for torts committed on behalf of the partnership, the liability of directors for breaches of their duty of care, or the liability of property owners for injuries occurring on their property. But the care variable can be interpreted more broadly to stand for any measure that reduces injurers' expected liability. Viewed in this light, the model applies as well to instances such as: parties involved in the preparation of a registration statement for securities, where the main issue in dispute is whether a misstatement in the registration statement was "material", and the misstatement may have been discovered and corrected if either party had exercised additional precaution; oligopolist engaged in price fixing, where a lower premium above the otherwise prevailing market price may make it more difficult to prove price fixing; or a producer and wholesaler of a defective product, where additional quality control measures would have reduced the number of defective products being sold.

II. Effects on Primary Behavior

Proposition 1: For $p>0$ and $p<1$, the joint and several damages amount exceeds the base damages amount for $n \geq 2$. For $p=0$ or $p=1$, both amounts are equal.

Proof: Let E(x) be the joint and several damage amount less the base damage amount (that is, the amount of *additional* expected liability resulting from the settlement effects described in Part I) with

$$E(x) = pD\{-1+n/[1+p(n-1)]\} = pD\{[(n-1)(1-p)/[1+p(n-1)]\}.$$

For p=0 and p=1, E(x)=0. For 0<p<1, E(x)>0 since all factors are positive.■

Proposition 1 shows that joint and several liability in most cases increases (and never decreases) the expected recovery by plaintiff, and thus the expected payments by defendants, relative to the base damages amount.[5] Nevertheless, this does not mean that joint and several liability provides greater incentives to exercise care. The effect on incentives to exercise care is determined, ceteris paribus, by the marginal change in excess liability. Seen from that perspective, it becomes evident that joint and several liability cannot increase incentives to exercise care over a full range of p. For both $p=1$ and $p=0$, the joint and several damage amount equals the base damage amount.

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[5] See also Spier, supra note 2, at 562. As Spier notes, the ratio between the joint and several damages amount and the base damages amount equals $n/[1+p(n-1)]$ and thus increases (approaches n) as p approaches zero. At p approaches zero, however, the base damage amount itself declines. Thus, Spier's conclusion that, as p declines, the discrepancy between the joint and several damages amount and the merits of the case (as expressed by the base damages amount) increases applies only to the ratio between these two values, and not to the discrepancy in absolute terms.

Thus, if at some point the joint and several damage amount *increases* faster than the base damage amount, at some other point the joint and several damage amount must *increase at a lower rate* than the base damages amount.

The precise effect of joint and several liability on the marginal change in expected liability depends mathematically on the shape of $p(x)$ (and $D(x)$), and conceptually on the nature of the uncertainty regarding defendants' liability. As one case, assume that uncertainty regarding liability results from uncertainty over the relevant degree of due care. If the possible degrees of due care lie within a finite range, then defendants will always be liable if their level of care falls below that range, will never be liable if their level of care is above that range, and will sometimes be liable if their level of care is within that range.

Proposition 2: If p ranges from 0 to 1, then for relatively low p (and thus high x), joint and several liability increases incentives to exercise care relative to the base damages amount. For relatively high p (and low x), joint and several liability decreases incentives to exercise care relative to the base damages amount.

Proof: Differentiating E(x) yields: $E'(x) = (n-1) * \{ D'(p-p^2) + Dp'[1-2p-p^2(n-1)]/[1+p(n-1)] \} / [1+p(n-1)]$ An increasing excess damages function ($E'(x)>0$) implies decreasing incentives to exercise care as excess damages represent a cost to defendants. A decreasing excess damages

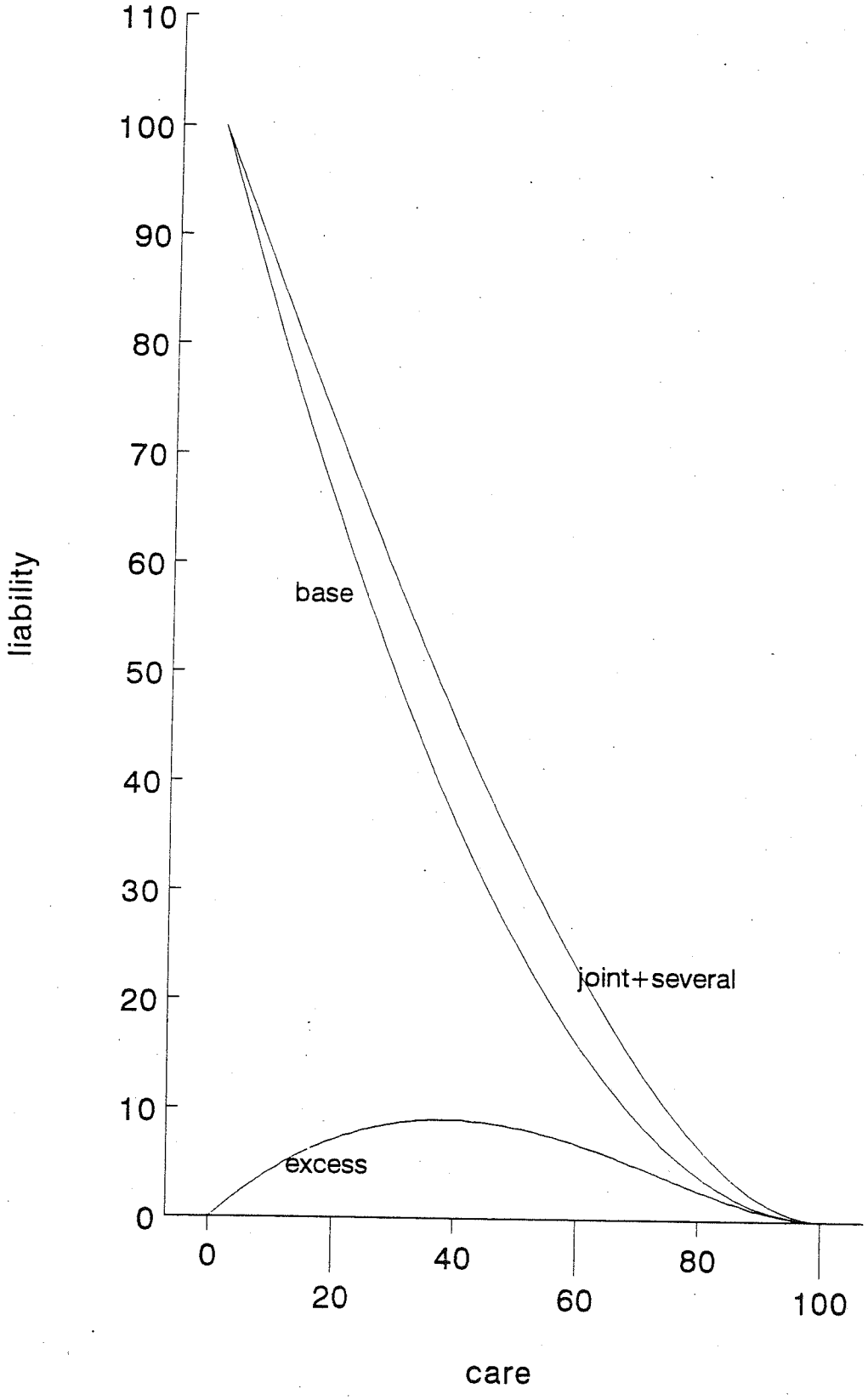
function implies increasing incentives to exercise care. For $p \to 1$, $E'(x) \to -Dp'(n-1)/n$. Since $p' \leq 0$, $p \to 0$, $-Dp'(n-1)/n \geq 0$, i.e. for low levels of care (high p), incentives to exercise care are decreasing. For $p \to 0$, $E'(x) \to (n-1)Dp' \leq 0$, i.e. for high levels of care (low p), incentives to exercise care are increasing.■

Example: Graph 1 plots the base damage amount, the joint and several damage amount, and the excess damage function for levels of care (x) from 0 to 100 with $p=1-x/100$, $n=2$, and $D=100-x$. For $x<38.2$, the base damage amount declines more steeply than the joint and several damage amount (rising excess damages). For $x>38.2$, the joint and several damage amount declines more steeply. The actual level of care defendants exercise depends on the cost of care function $c(x)$. For instance, for $c(x) = x$, defendants would exercise care at 50 under non-joint liability and at 59 under joint and several liability; for $c(x) = 1.4x$, defendants would exercise care at 30 under non-joint liability and at 17 under joint and several liability.

[Insert Graph 1]

As another case, assume that uncertainty regarding liability results exclusively from uncertainty regarding a collateral issue, e.g. from uncertainty over whether the statute of limitations has expired or whether there is jurisdiction over the defendants. In such a case, p would not at all depend on the level of care (and the level of care would affect expected

Graph 1


110
100
90
80
70
60
50
40
30
20
10
0
liability
base
joint+several
excess
0
20
40
60
80
100
care

liability only through $D(x)$)'.[6]

Proposition 3: If p is independent of x (and $0<p<1$), then joint and several liability increases incentives to exercise care relative to the base damages amount for $n \geq 2$.

Proof: For $p'(x)=0$, $E'(x) = (n-1)\, D'(p-p^2) \,/\, [1+p(n-1)]$ which decreases in x since $D'<0$ and all factors are positive.

Example: Graph 2 plots the base damage amount, the joint and several damage amount, and the excess damage function for levels of care (x) from 0 to 100 with $p=.3$, $n=2$, and $D=100[1-(x/100)^{2}]$. For any x, the joint and several damage amount declines more steeply than the base damage amount declines. Thus, incentives to exercise care are higher under joint and several liability.

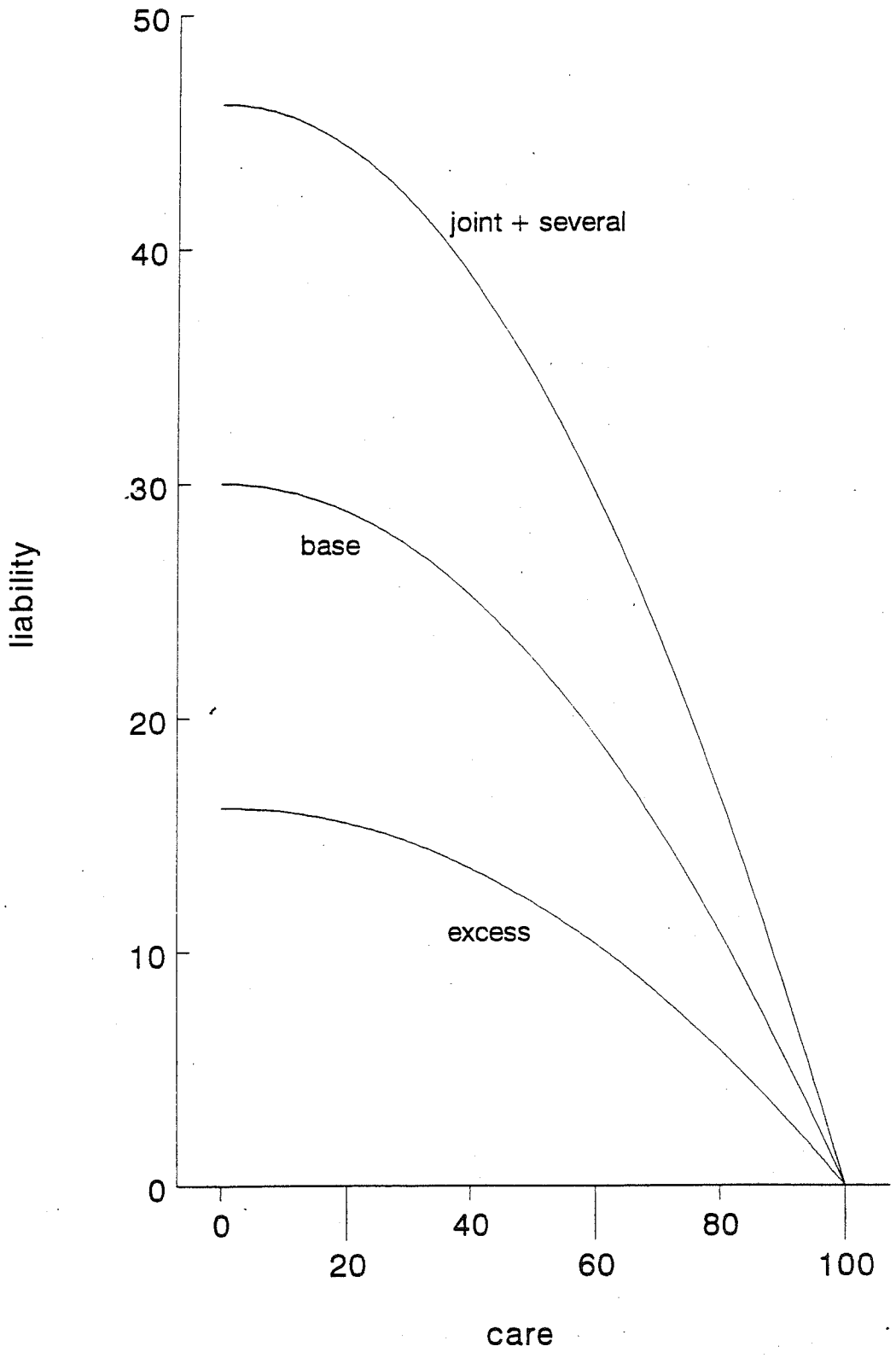
[Insert Graph 2]

III. Implications and Conclusion

The effect of joint and several liability on incentives to exercise care is ambiguous. More specifically, it depends on the nature of the uncertainty regarding defendants' liability. If

[6] In a third case, p may depend on the level of care, but may not take on the full range of values from 0 to 1. For example, there may be uncertainty both over the level of due care and over whether the statute of limitations has run. In that case, even if the defendants exercised a level of care below the range of possible degrees of due care, p would be less than 1. In such a case, joint and several liability can have different kinds of effect. Similar to the first case, it can increase incentives to exercise care for low levels of p and decrease incentives for high levels of p. Similar to the second case, it can increase incentives for any p. Finally, in can increase incentives to exercise care for low levels of p, decrease incentives for higher levels of p, and then again increase incentives to exercise care.

Graph 2


50
40
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0
liability
joint + several
base
excess
0
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60
80
100
care

the uncertainty results from uncertainty over the level of due care, joint and several liability tends to push incentives to exercise care to the extreme. That is, it increases incentives when x is relatively high, but decreases incentives when x is relatively low. If uncertainty results from issues independent of the level of care defendants exercise, joint and several liability always increases incentives to exercise care.

This effect of joint and several liability and several important policy implications. First, the damage rules that are optimal in the single-defendant case are unlikely to be optimal in the multi-defendant joint and several liability case. Second, it is difficult to determine how the optimal damage rule in the multidefendant case differs from the one for the single-defendant case. Third, joint and several liability is more sensitive to sub-optimal and imprecise damage rules than single-defendant liability.

One tentative conclusion that may be drawn from these implications is that it may be worth considering to replace joint and several liability in some case with non-joint liability. As noted, the expected damage award in the non-joint liability multi-defendant case equals the expected damage award in the single-defendant case. Thus, it is much easier to use non-joint liability than joint and several liability as a policy tool. Of course, the choice between joint and several liability and non-joint liability has several other important dimensions which ought to be examined before the optimal regime can be determined.