SETTLEMENTS UNDER JOINT AND SEVERAL LIABILITY

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In this Article, Professors Kornhauser and Revesz study the settlement-inducing properties of the rules governing the litigation of claims involving multiple defendants. Most importantly, they show that the effects of joint and several liability on the choice between settlement and litigation depend on the correlation of the plaintiff's probabilities of success against the defendants. In the case of two defendants, these probabilities are independent if the outcome of the plaintiff's claim against one defendant does not depend upon whether the plaintiff prevails against, loses to, or settles with the other defendant. In contrast, these probabilities are perfectly correlated if, when the plaintiff litigates against both defendants, it either has to prevail against both or lose to both. Joint and several liability coupled with a pro tanto set-off rule (under which, when the plaintiff settles with one defendant and litigates against the other, its claim against the non-settling defendant is reduced by the amount of the settlement), discourages settlement with both defendants if the plaintiff's probabilities of success are independent. In turn, joint and several liability encourages settlement with at least one defendant if these probabilities are perfectly correlated. The authors also analyze the arguments raised by the courts concerning the relative settlement-inducing properties of the pro tanto set-off rule and the apportioned share set-off rule (under which, when the plaintiff settles with one defendant and litigates against the other, its claim against the non-settling defendant is reduced by the apportioned share of the settling defendant). They show that essentially all of these arguments are based on an incomplete or incorrect understanding of the incentives faced by the respective parties.

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INTRODUCTION

Last Term, in *Musick, Peeler & Garrett v. Employers Insurance*,¹ the Supreme Court granted certiorari to decide whether defendants held jointly and severally liable in actions under section 10(b) of the Securities Exchange Act of 1934 and Rule 10b-5 of the Securities and Exchange Commission have the right to seek contribution from other liable defendants.² The briefs submitted by the parties and by several amici representing powerful trade associations disagreed vigorously about which sets of rules regarding a right of contribution would better promote settle-

¹ 113 S. Ct. 2085 (1993).
² Id. at 2086. For the order granting certiorari, see *Musick, Peeler & Garrett v. Employers Ins.*, 113 S. Ct. 54 (1992).
ments. Ultimately, the Court declined to consider these arguments. Focusing instead on the structure of the statutory scheme, it held that contribution was available.

In many other contexts, however, common law courts are choosing among alternative rules governing the litigation of claims involving multiple defendants based on the courts' views about the relative settlement-inducing properties of these rules. This practice is by no means limited to the state courts. Federal courts routinely make such decisions, invoking their common law powers under such disparate statutes as the Securities Exchange Act, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Civil Rights Act, the

3 Amicus briefs were filed by the American Institute of Certified Public Accountants, the Securities Industry Association, the National Association of Securities and Commercial Law Attorneys, and several investment banks. See Musick, Peeler & Garrett, 113 S. Ct. at 54 (granting motion to file). These briefs, as well as those filed by the parties, uncritically present many of the judicial arguments that we criticize in Part IV. For further discussion, see notes 24, 152 infra.

4 See 113 S. Ct. at 2089.

5 See id. at 2089-92.


9 See, e.g., Dobson v. Camden, 705 F.2d 759, 768-71 (5th Cir. 1983), rev'd on other grounds, 725 F.2d 1003 (5th Cir. 1984); Miller v. Apartments & Homes, Inc., 646 F.2d 101, 105-10 (3d Cir. 1981).
Employee Retirement Income Security Act (ERISA),\textsuperscript{10} the Federal Deposit Insurance Act,\textsuperscript{11} as well as under the federal law of admiralty.\textsuperscript{12}

The federal common law governing litigation involving multiple defendants is rife with conflicts among the circuits. Under the securities laws,\textsuperscript{13} ERISA,\textsuperscript{14} and admiralty,\textsuperscript{15} the circuits differ on the set-off to be applied, as a matter of federal common law, to a plaintiff’s claim against a non-settling defendant following a settlement with another


\textsuperscript{11}See, e.g., FDIC v. Geldermann, Inc., 975 F.2d 695 (10th Cir. 1992); Resolution Trust Corp. v. Gallagher, 815 F. Supp. 1107, 1110-12 (N.D. Ill. 1993).

\textsuperscript{12}See, e.g., In re Oil Spill by the Amoco Cadiz, 954 F.2d 1279, 1315-18 (7th Cir. 1992) (per curiam); Hernandez v. M/V RAJAAN, 841 F.2d 582, 591 (5th Cir.), cert. denied, 488 U.S. 981 (1988); Leger v. Drilling Well Control, Inc., 592 F.2d 1246, 1248-51 (5th Cir. 1979).


\textsuperscript{14}Compare In re Masters Mates & Pilots Pension Plan & IRAP Litig., 957 F.2d at 1029-31 (holding that set-off should be no less than under pro tanto set-off rule) with Lumpkin v. Envirodyne Indus., 933 F.2d 449, 464 (7th Cir.) (adopting apportioned share set-off rule), cert. denied, 112 S. Ct. 373 (1991).

\textsuperscript{15}The courts have identified three different approaches: (1) reducing the plaintiff’s claim against the non-settling defendant using a pro tanto set-off rule and allowing a non-settling defendant that pays more than its apportioned share of the liability to bring an action for contribution against the settling defendant; (2) reducing the plaintiff’s claim against the non-settling defendant by a pro tanto set-off rule and protecting the settling defendant from contribution actions; and (3) reducing the plaintiff’s claim against the non-settling defendant using an apportioned share set-off rule. See Miller v. Christopher, 887 F.2d 902, 905 (9th Cir. 1989). The Eighth Circuit has adopted the third approach. See Associated Elec. Coop. v. Mid-America Transp. Co., 931 F.2d 1266, 1269-71 (8th Cir. 1991). The Seventh Circuit has rejected the third approach but has not chosen between the first two. See \textit{Amoco Cadiz}, 954 F.2d at 1315-18. The Eleventh Circuit has adopted the first approach. See Boca Grande Club, Inc. v. Polackwich, 990 F.2d 606 (11th Cir.), cert. granted sub nom. Boca Grande Club, Inc. v. Florida Power & Light Co., 114 S. Ct. 39 (1993); Great Lakes Dredge & Dock Co. v. Tanker Robert Watt Miller, 957 F.2d 1575, 1581 (11th Cir.), cert. denied, 113 S. Ct. 484 (1992). The Ninth Circuit has rejected the first approach but has not chosen between the second and third. See Miller, 887 F.2d at 906-07. For a discussion of the conflict, see \textit{Great Lakes Dredge & Dock Co.}, 957 F.2d at 1581-83.
This Term, the Supreme Court granted certiorari to resolve the conflict among the circuits on the appropriate set-off rule under the law of admiralty. Unlike the situation in the *Musick, Peeler & Garrett* case, statutory guidance is simply unavailable in this case. The Court will therefore have no alternative but to invoke its power to fashion federal common law. Given the strong and oft-repeated interest in promoting the settlement of disputes, particularly in multi-defendant cases, the relative impact of the competing rules on the choice between settlement and litigation is likely to play an important role in the resolution of these disputes.

The purpose of this Article is to guide the choice of an appropriate legal regime—at both the federal and state levels—to govern litigation involving joint tortfeasors. Our analysis focuses solely on the impact of the competing legal rules on the choice between settlement and litigation: the plaintiff has already suffered the harm, and the question is whether it will have to litigate in order to recover. We do not consider which rules are better from the perspective of inducing the socially desirable amount of deterrence.

Part I categorizes legal rules in this area by reference to eight relevant elements: (1) whether there is joint and several liability; (2) whether there is a right of contribution; (3) whether the right of contribution is pro rata or by reference to comparative fault; (4) whether, when the plaintiff settles with one defendant and litigates against the other, its

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16 Throughout most of this Article, we focus specifically on the problem of two tortfeasors. In Part II.E.9, however, we show how our central conclusions hold when there are more than two defendants.


claim against the non-settling defendant is reduced by the amount of
the settlement (a pro tanto set-off rule), or, instead, by the settling de-
fendant's share of the liability (an apportioned share set-off rule); (5)
whether settling defendants are protected from contribution actions; (6)
whether settling defendants have a right to bring contribution actions; (7)
whether there is judicial supervision of the substantive adequacy of settle-
ments; and (8) whether the claims involving all the joint tortfeasors are
joined together in a single proceeding. This scheme, rather than the
truncated taxonomy generally used by the courts, significantly aids the
analysis of the relative merits of the competing rules.

Part II provides a comprehensive analysis of the settlement-inducing
property of a rule containing the following elements: (1) joint and sev-
eral liability; (2) a right of contribution; (3) contribution determined by
reference to comparative fault; (4) a pro tanto set-off rule; (5) contribu-
tion protection for settling defendants; (6) no right of contribution for
settling defendants; (7) no judicial supervision of the substantive ade-
quacy of settlements; and (8) joinder of the claims against all the joint
tortfeasors. It shows that the impact of this rule on the choice between
settlement and litigation depends centrally on the correlation of the
plaintiff's probabilities of success against both defendants.23

Because the correlation of the plaintiff's probabilities of success
plays such a central role in our analysis and yet has been overlooked in
the prior works, it is important at this point to elucidate the concept.
These probabilities are independent if the outcome of the plaintiff's claim
against one defendant does not depend upon whether the plaintiff
prevails against, loses to, or settles with the other defendant. For exam-
ple, suppose that the plaintiff seeks to recover the costs of cleaning up a
hazardous waste site, and each of two unrelated defendants argues that it
did not send hazardous substances to the site. The outcome of the plain-
tiff's case against one defendant is then independent of the outcome of its
case against the other. Or, consider a "hub and spoke" conspiracy in
which several parties are alleged to have conspired with the "hub." The
fact that one party did so says nothing about whether others did so as
well; thus the plaintiff's probabilities of prevailing against the various
"spokes" are independent.

In contrast, the plaintiff's probabilities are perfectly correlated if,
when the plaintiff litigates against both defendants, it either prevails
against both or loses to both. In the previous example, suppose that the
defendants argue, instead, that the plaintiff's cleanup was inappropri-
ately expensive; there is then no scenario under which one would prevail

23 Compare Part II.B (independent probabilities) with Part II.C (perfectly correlated
probabilities).
if the other does not. The plaintiff’s probabilities of success are also perfectly correlated in a case in which only two defendants are alleged to have engaged in a conspiracy; because it is not possible for a party to conspire with itself, if one defendant prevails, the other will do so as well. Respondeat superior cases in which the agent’s authority is conceded also have this feature.

Part II establishes that if the plaintiff’s probabilities of success are independent, the plaintiff litigates against both defendants unless the costs of litigation are sufficiently high; this result also holds if the probabilities are sufficiently, though not wholly, independent. In contrast, if these probabilities are perfectly correlated, the plaintiff settles with at least one defendant regardless of the magnitude of the litigation costs; this result also holds if the probabilities are sufficiently, though not perfectly, correlated. Part II concludes with an analysis of the relevance of the model’s assumptions.

Part III studies the settlement-inducing properties of some alternative legal rules. It reaches three principal conclusions. First, the pro tanto set-off rule generally promotes more settlements than the apportioned share set-off rule when the costs of litigation are low, but can promote fewer settlements when these costs are high. Second, a regime with no right of contribution has identical effects on the choice between settlement and litigation as one with contribution. Third, joint and several liability discourages settlement when the plaintiff’s probabilities of success are independent; in contrast, when these probabilities are perfectly correlated, joint and several liability generally promotes settlement when it is coupled with the pro tanto set-off rule, and has no effect on settlement when it is coupled with the apportioned share set-off rule.

Part IV turns its attention to the work of common law courts in the area in which the courts are most deeply divided: the choice of set-off rules. It shows that essentially all the arguments raised by the courts about the relative settlement-inducing properties of the competing set-off rules are based on an incomplete or incorrect understanding of the incentives faced by the respective parties. In particular, the courts fail to account for the strategic nature of the interaction among the parties.

This Article presents the first comprehensive analysis of the problem of settlement in cases involving joint tortfeasors. The two most serious prior efforts in this area both focused on only a subset of the problem—the case of perfectly correlated probabilities—and studied only a limited subset of the legal rules. Because they did not understand the way in

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which their analyses were limited, they couched their conclusions—most importantly, that joint and several liability promotes settlement—in general terms. We show, by focusing on the impact of the correlation of the plaintiff’s probabilities of success, that what the prior works took to be a general result is in fact a special case, and that the problem is far more complex than the prior commentators had acknowledged.

I

CATEGORIZING THE LEGAL REGIME

In order to analyze properly the impact of joint and several liability on settlement, one must specify with care each of the components of the competing legal rules. We first categorize such rules by reference to eight elements. We then show why our taxonomy eliminates some of the confusion reflected in judicial decisions.

A. A Taxonomy

For each of the eight elements that we use to define the legal regime governing the litigation of claims involving joint tortfeasors, we discuss the major alternatives. We focus principally on the approaches of the Restatement (Second) of Torts (Restatement), the Uniform Contribution Among Tortfeasors Act (UCATA), and the Uniform Comparative Fault Act (UCFA). In the margin, we consider federal common law rules developed under some important federal statutes.

1. Joint and Several Liability Versus Non-Joint (Several Only) Liability

Under joint and several liability, if the plaintiff litigates against two defendants and prevails against only one, it can recover its full damages from that defendant. In contrast, under non-joint (several only) liability, the plaintiff would only recover the portion of the damages attributable to the actions of the losing defendant.

The Restatement calls for the application of joint and several liability where damages “cannot be apportioned among two or more

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25 Restatement (Second) of Torts (1965) [hereinafter Restatement].


The comments add that "[w]here two or more causes combine to produce . . . a single result, incapable of division on any logical or reasonable basis, and each is a substantial factor in bringing about the harm, the courts have refused to make an arbitrary apportionment for its own sake, and each of the causes is charged with responsibility for the entire harm." As an example, the Restatement provides the case of two automobiles driven negligently that hit a bystander; the two drivers would be jointly and severally liable to the bystander.

The Restatement has been influential in the development of federal common law. For example, under CERCLA, relying explicitly on the Restatement's provisions, the courts have fashioned a rule of joint and several liability where the harm caused by the presence of hazardous substances at a site is "indivisible." The remaining elements set forth in this Section are relevant only for joint and several liability. Under non-joint liability, the plaintiff essentially has independent claims against the defendants, and the questions discussed below do not arise.

2. The Right of Contribution

A right of contribution permits a defendant that has paid a disproportionately large share of the plaintiff's liability to obtain compensation from a defendant that has paid a disproportionately small share of this liability. Under the Restatement, there is a right of contribution among defendants found jointly and severally liable for a single harm. Both the UCATA and UCFA also recognize such a right.

The Restatement, the UCATA, and the UCFA thus reject the traditional common law rule, generally traced to Merryweather v. Nixan, barring contribution among defendants found jointly and severally liable for a harm. This common law rule has been rejected by the federal courts under their common law powers, as well as by the vast majority

28 Restatement § 433A.
29 Id. cmt. i.
30 See id. illus. 12.
32 The computation of these shares is discussed in Part I.A.3 infra.
33 See Restatement § 886A(1).
34 UCATA § 1, 12 U.L.A. at 63; UCFA § 4, 12 U.L.A. at 54.
36 See, e.g., Musick, Peeler & Garrett v. Employers Ins., 113 S. Ct. 2085 (1993) (securities
3. *The Nature of the Right of Contribution*

Under the UCATA, contribution is determined by reference to pro rata shares of the liability. Contribution is available only to a tortfeasor that has paid more than its pro rata share of the liability. In turn, contribution is not available from a tortfeasor that has paid at least its pro rata share of the liability. Thus, if two defendants are jointly and severally liable, contribution is available only to a defendant that has paid more than half of the liability, and the comparative levels of fault play no role in the determination of whether contribution is available.

In contrast, under the UCFA and the Restatement, contribution is determined by reference to comparative fault. The Restatement further provides that a defendant can avail itself of this right only if it has paid more than its equitable share of the liability. Moreover, no defendant can be required to contribute beyond its equitable share. The comparative fault approach is the rule generally adopted under federal common law and in most state jurisdictions.

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37 See *Northwest Airlines*, 451 U.S. at 86-88 & n.17.
38 See UCATA § 1(a), 12 U.L.A. at 63.
39 See id. § 1(b).
40 See id.
41 The UCATA provides, however, that "if equity requires[,] the collective liability of some as a group shall constitute a single share." Id. § 2(b), 12 U.L.A. at 87.
42 See Restatement § 886A(2); UCFA § 4(a), 12 U.L.A. at 54.
43 See Restatement § 886A(2).
4. The Choice of Set-Off Rule

The question of an appropriate set-off rule arises when the plaintiff settles with one defendant and litigates against the other. The UCATA provides that in the event of a settlement with one defendant, the plaintiff's claim against the non-settling defendant is reduced "to the extent of any amount stipulated by the release or the covenant, or in the amount of the consideration paid for it, whichever is greater." This rule is commonly referred to as a pro tanto set-off rule.

In contrast, under the UCFA, the plaintiff's claim is reduced by the settling defendant's "equitable share of the obligation." We refer to this rule as the apportioned share set-off rule. Note that while under the UCFA the apportioned share set-off rule is coupled with contribution by reference to comparative fault, one could have an apportioned share set-off rule in a legal regime in which contribution was determined pro rata. Then, the plaintiff's claim against a non-settling defendant would be reduced by the pro rata share attributable to the settling defendant. In both cases, the plaintiff's claim is reduced by the amount that would have been attributable to the settling defendant if both defendants had litigated and lost. For this reason, we find the term "apportioned share set-off rule" more revealing than the terms "proportional" set-off rule or "comparative fault" set-off rule, which are generally employed by the courts.

The Restatement addresses the issue of set-off rules in two separate places. Section 885(3) provides that "[a] payment by any person made in compensation of a claim for a harm for which others are liable as tortfeasors diminishes the claim against the tortfeasors, at least to the extent of the payment made." This section thus provides that the set-off would be no less than that provided under the pro tanto set-off rule. The Restatement's comments to section 886A, however, describe both the pro tanto and apportioned share set-off rules, but do not endorse either rule.

As indicated above, the federal courts are deeply divided on the choice between these two set-off rules. This split exists not only across
statutory schemes, but also within a single scheme.\(^{52}\)

The two set-off rules differ in their effect on the plaintiff's recovery when it settles with one defendant and prevails in litigation against the other. Under the pro tanto set-off rule, the plaintiff recovers its full damages regardless of the amount of the settlement. Under the apportioned share set-off rule, if the settlement is for less than the settling defendant's apportioned share of the liability, the plaintiff does not recover its full damages even if it prevails against the other defendant.

Consider an example in which contribution is determined by reference to comparative fault, the two defendants are each equally at fault, and the plaintiff's damages are $100. If the plaintiff settles with one defendant for $20, under the apportioned share set-off rule it can recover only $50 from the other defendant, thus suffering a shortfall of $30. What happens, however, if the settlement is for $70? Can the plaintiff nonetheless recover $50 from the non-settling defendant? Most jurisdictions allow such recovery,\(^{53}\) as do the federal courts under the securities laws.\(^{54}\) The reasoning is that because under the apportioned share set-off rule the plaintiff bears the risk of a low settlement, it should obtain the benefit of a high settlement.\(^{55}\) In contrast, New York follows a constrained version of the apportioned set-off rule—limiting the plaintiff's total recovery to its damages in the event that it settles with one defendant and litigates against the other.\(^{56}\)

The preceding discussion assumes that there is a right of contribu-


\(^{53}\) See, e.g., Austin v. Raymark Indus., 841 F.2d 1184, 1190-91 (1st Cir. 1988) (applying Maine law); Kussman v. City & County of Denver, 706 P.2d 776, 779-82 (Colo. 1985); Thomas v. Solberg, 442 N.W.2d 73, 76-78 (Iowa 1989); Rambaum v. Swisher, 435 N.W.2d 19, 22-23 (Minn. 1989); Duncan v. Cessna Aircraft Co., 665 S.W.2d 414, 429-32 (Tex. 1984).


\(^{55}\) See, e.g., Austin, 841 F.2d at 1190-91; MFS Mun. Income Trust, 751 F. Supp. at 285; Duncan, 665 S.W.2d at 430.

tion. In the absence of such a right, there also is a question about how a settlement with one defendant should affect the plaintiff's claim against the non-settling defendant. The most logical approach in that instance is to use a pro tanto set-off rule. Without a right of contribution, if the plaintiff litigates and prevails against both defendants, it can choose to obtain its full damages from one of the defendants, despite the resulting unfairness. It is not clear why one should be more concerned about this unfairness when the plaintiff settles with one defendant and litigates against the other. We are not aware of any jurisdiction that has coupled a rule of no contribution with an apportioned share set-off rule.

5. Contribution Protection for Settling Defendants

Of course, in the absence of a general right of contribution, settling defendants, like all other defendants, are protected from contribution actions. In contrast, regimes that recognize the right of contribution between defendants found jointly and severally liable at trial must answer the further question whether a contribution action can be maintained against a settling defendant.

When one defendant settles, and the other litigates and ultimately loses, the question whether the settling defendant is protected from contribution actions arises only for the pro tanto set-off rule, under which it is possible that the litigating defendant will be liable for more than its equitable share of the liability. Under the apportioned share set-off rule, the litigating defendant never has to pay more than its equitable share of the liability and therefore never has the right to maintain a contribution action.

In contrast, when the plaintiff settles with both defendants, and one of them pays more than its equitable share of the liability while the other pays less than its share, the question whether the former defendant can bring a contribution action against the latter arises under both set-off rules. The resolution depends both on whether settling defendants are

57 In Sears v. Atchison, Topeka & Santa Fe Ry., 749 F.2d 1451, 1454-55 (10th Cir. 1984), cert. denied, 471 U.S. 1009 (1985), the court considered what set-off rule to apply under Title VII, under which contribution is unavailable. See note 36 supra. The Tenth Circuit deferred to the district court's choice of a pro tanto set-off rule on the ground that this rule would encourage settlements. 749 F.2d at 1455.

58 This approach is followed under the antitrust laws, where, as we discussed in note 36 supra, contribution is barred. See, e.g., Gulfstream III Assocs. v. Gulfstream Aerospace Corp., 995 F.2d 425, 434 (3d Cir. 1993).

59 Note, however, that if the plaintiff settles for more than the settling defendant's apportioned share of the liability, it would be better off under the apportioned share set-off rule, which would allow it to recover more than its damages. See text accompanying notes 53-54 supra.

60 Thus, under the federal securities laws, courts adopting the apportioned share set-off rule have nonetheless faced the question of whether settling defendants are protected from
protected from contribution actions, which is the focus of this Subsection, and on whether settling defendants have the right to bring contribution actions, to which we turn in the next Subsection.

The Restatement presents examples of legal rules with and without contribution protection for settling defendants, but it does not endorse either option.61 The UCATA provides that if a settlement is entered in good faith, "[i]t discharges the tortfeasor to whom it is given from all liability for contribution to any other tortfeasor."62 The UCFA provides that a settlement discharges that defendant "from all liability for contribution."63 Thus, while the Restatement neither approves nor disapproves of it, both model laws provide for contribution protection, though the UCATA qualifies this protection by limiting it to settlements entered in good faith.64

6. Contribution Rights for Settling Defendants

The existence of a right of contribution among defendants found

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61 See Restatement § 886A caveat & cmt. m(1)-(2).
62 UCATA § 4(b), 12 U.L.A. at 98. The 1939 version of the UCATA had not provided contribution protection. The Commissioners' Comment indicates that the lack of such protection "has been one of the chief causes for complaint where the Act has been adopted, and one of the main objections to its adoption." Id. cmt. on subsection (b), 12 U.L.A. at 99.
63 UCFA § 6, 12 U.L.A. at 57.
64 As noted in note 15 supra, the circuits are split on the question of contribution protection in admiralty actions. Compare Miller v. Christopher, 887 F.2d 902, 906 (9th Cir. 1989) (providing contribution protection) with Boca Grande Club, Inc. v. Polackwich, 990 F.2d 606 (11th Cir.) (11th Cir.) (same), cert. denied, 115 S. Ct. 484 (1992).


For differing approaches under ERISA, see In re Masters Mates & Pilots Pension Plan & IRAP Litig., 957 F.2d 1020, 1031-32 (2d Cir. 1992) (noting that contribution protection provisions in settlements are valid only for "fair" settlements); Donovan v. Robbins, 752 F.2d 1170, 1181 (7th Cir. 1984) (Posner, J.) (declining to adopt rule of contribution protection where settlement agreement does not call for such protection).

jointly and severally liable does not necessarily imply that settling defendants also will enjoy such a right. The question of the contribution rights of settling defendants can arise in three instances. First, as indicated above, if both defendants settle, a defendant that has paid more than its equitable share can bring an action against one that has paid less than its equitable share only if the legal regime allows a right of contribution for settling defendants and does not protect settling defendants from such actions. This problem can arise under either set-off rule.

Second, if the legal regime gives settling defendants a right of contribution, a defendant that settles for more than its apportioned share of the liability can bring a contribution action against a defendant that litigates, loses, and is liable for a judgment that is less than its equitable share of the liability. This situation arises only under the pro tanto set-off rule, because under the apportioned share set-off rule, a defendant that litigates and loses would pay its equitable share of the liability.

Third, current rules of collateral estoppel allow a defendant that settles for more than its apportioned share of the liability to bring a contribution action against a defendant that prevailed in its litigation against the plaintiff. Such an action may be brought under either set-off rule.\textsuperscript{65}

Under the Restatement, the UCATA, and the UCFA, a settling defendant can seek such contribution only to the extent that the plaintiff's claim against the other defendants is extinguished by the settlement.\textsuperscript{66} Thus, a settling defendant cannot avail itself of the right of contribution in cases in which the plaintiff settles with it and litigates against the other defendant, or where the plaintiff settles with both. Such a right is available only when the settlement with one defendant provides that the plaintiff will drop its claim against the other.\textsuperscript{67}

7. The Nature of "Good Faith" Hearings on the Adequacy of Settlements

Under the pro tanto set-off rule, if the plaintiff enters into an inadequately low settlement with one defendant and that defendant obtains contribution protection as a result of the settlement, the other defendant

\textsuperscript{65} See text accompanying notes 167-74 infra.

\textsuperscript{66} See Restatement § 886A cmt. f; UCATA § 1(d), 12 U.L.A. at 63; UCFA § 4(b), 12 U.L.A. at 54.

\textsuperscript{67} CERCLA contains a statutory provision giving defendants that settle with the federal government or with a state the right to bring contribution actions against non-settling defendants, regardless of whether the settlement extinguishes the plaintiff's rights against those defendants. See 42 U.S.C. § 9613(f)(3)(B) (1988). The courts have held that this statutory provision does not extend to settlements with private parties, and they have fashioned a common law rule that, consistent with the UCATA and UCFA, precludes contribution except where the settlement extinguishes the liability of the party from whom contribution is sought. See, e.g., American Cyanamid Co. v. King Indus., Inc., 814 F. Supp. 215, 217-18 (D.R.I. 1993); Amland Properties Corp. v. Aluminum Co., 808 F. Supp. 1187, 1197-99 (D.N.J. 1992).
is responsible for the shortfall if it litigates and loses. To protect the interests of non-settling defendants, courts typically require “good faith” or “fairness” hearings on the adequacy of settlements.68

The Restatement, UCATA, and UCFA are all silent on the nature of good faith hearings. The courts are divided on whether this hearing should involve only a procedural inquiry about the absence of collusion between the plaintiff and the settling defendant, 69 or whether it should also scrutinize the substantive adequacy of the settlement.70 This split is well illustrated by Tech-Bilt, Inc. v. Woodward-Clyde & Associates.71 In Tech-Bilt, the California Supreme Court held that the good faith inquiry “would enable the trial court to inquire, among other things, whether the amount of the settlement is within the reasonable range of the settling tortfeasor’s proportional share of comparative liability for the plaintiff’s injuries.” 72 In a strong dissent, Chief Justice Bird argued that “a settlement satisfies the good faith requirement if it is free of corrupt intent, that is, free of intent to injure the interests of the nonsettling tortfeasors. A settlement is made in bad faith only if it is collusive, fraudulent, dishonest, or involves tortious conduct.” 73 Under her approach the inquiry is solely procedural; she would not inquire into the substantive adequacy of the settlement.74

The preceding discussion was limited to regimes of contribution, contribution protection, and pro tanto set-off. There is no reason to have

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68 See notes 69-74 infra.

69 CERCLA has no statutory requirement for a “good faith” hearing. In the case of settlements with the government, the courts have inquired whether the settling parties acted in bad faith. In the absence of malfeasance, the courts have given a great deal of deference to the government’s decision to settle and have not engaged in a detailed analysis of the substantive adequacy of the settlement. See, e.g., Comerica Bank-Detroit v. Allen Indus., Inc., 769 F. Supp. 1408, 1411-12 (E.D. Mich. 1991); Kelley v. Thomas Solvent Co., 717 F. Supp. 507 (W.D. Mich. 1989). For commentary, see Mason, supra note 8, at 112-14.


71 698 P.2d 159 (Cal. 1985).

72 Id. at 166.

73 Id. at 169 (Bird, C.J., dissenting).

74 Approaches similar to that of Tech-Bilt have been adopted in other jurisdictions. See, e.g., International Action Sports, Inc. v. Sabellico, 573 So. 2d 928, 929-30 (Fla. Ct. App.), review denied, 583 So. 2d 1036 (Fla. 1991); Pickett v. Stephens-Nelsen, Inc., 717 P.2d 277, 282 (Wash. Ct. App. 1986). Several jurisdictions, however, have rejected the Tech-Bilt approach and have sided with Chief Justice Bird. See, e.g., Noyes v. Raymond, 548 N.E.2d 196, 199-200 (Mass. App. Ct. 1990). Other courts have held that the Tech-Bilt inquiry is not required and have given the trial courts broad discretion to determine what factors are relevant to the good faith inquiry. See, e.g., Velsicol Chem. Corp. v. Davidson, 811 P.2d 561 (Neve. 1991).
good faith hearings in the absence of a right of contribution. If the plaintiff can collect its damages in any way that it wants when it litigates and prevails against both defendants, it is not logical to be concerned about fairness when the plaintiff settles with one defendant and litigates against the other.\textsuperscript{75} Also, there is no reason for such hearings under contribution regimes that do not provide contribution protection to a settling defendant. Then, the remedy for a non-settling defendant that pays more than its apportioned share of the liability is to seek contribution from the settling defendant. Finally, good faith hearings are not necessary under the apportioned share set-off rule because there the plaintiff, rather than the non-settling defendant, suffers the loss from a low settlement.

8. Joinder Rules

If the plaintiff joins all the joint tortfeasors in a single suit, its claims against all of them will be adjudicated in the same proceeding. If the plaintiff chooses not to join all the tortfeasors as defendants, the question arises whether a named defendant can join another tortfeasor as a third-party defendant. Otherwise, the named defendant would have to file a separate action for contribution after the adjudication of its liability to the plaintiff.

Both the Restatement and the UCATA state in their comments that this matter is governed by the procedural rules of the state in which the action is brought.\textsuperscript{76} The UCFA states that the right of contribution "may be enforced either in the original action or in a separate action brought for that purpose,"\textsuperscript{77} but does not specify how this determination should be made.

In federal court, this question is determined by reference to Rules 14(a) and 42 of the Federal Rules of Civil Procedure, which govern third-party practice. Rule 14(a) provides that a defendant, acting as a third-party plaintiff, may bring an action for contribution, as of right within ten days of the filing of its answer, and with leave of the court thereafter.\textsuperscript{78} Rule 42 gives the court discretion either to order a single trial or to sever the actions for separate trial.\textsuperscript{79} In general, courts have been reluctant to sever contribution or indemnification claims from the primary action.\textsuperscript{80}

\textsuperscript{75} See text accompanying notes 58-59 supra.
\textsuperscript{76} Restatement § 886A cmt. i; UCATA § 3(b) Commissioners' cmt., 12 U.L.A. at 89.
\textsuperscript{77} UCFA § 4(a), 12 U.L.A. at 54.
\textsuperscript{78} Fed. R. Civ. P. 14(a).
\textsuperscript{79} Fed. R. Civ. P. 42.
B. Competing Taxonomies

Some recent cases provide different ways to categorize the legal regimes governing the litigation of claims against joint tortfeasors. This Section explains how our taxonomy removes many ambiguities and makes possible a clearer analysis of the relative merits of the different legal rules.

In re Oil Spill by the Amoco Cadiz provides the most comprehensive categorization of the legal regime that we have found in the case law. There, the Seventh Circuit observes that there are four potential rules: (1) no contribution, (2) contribution, (3) contribution plus settlement bar, and (4) claim reduction. Under all four rules, each defendant is jointly and severally liable for the full damages if the plaintiff prevails against both.

Under a rule of no contribution, the plaintiff can collect any part of its award from any of the defendants and no defendant can obtain contribution from another. Under a rule of contribution, the plaintiff can collect any part of the award from any of the defendants, and a party that pays more than its share of the award can get contribution from a party that pays less than its share. A rule of contribution plus settlement bar differs from the former in that a defendant cannot obtain contribution from a settling defendant. The settlement bar is thus equivalent to what we call contribution protection for settling defendants. Finally, under a rule of claim reduction, if the plaintiff settles with one defendant, its claim against the other defendant is reduced by the share attributable to the settling defendant; the non-settling defendant cannot obtain contribution from the settling defendant because it does not pay more than its share of the liability. Claim reduction is thus equivalent to what we

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81 See text accompanying notes 82-95 infra.
82 954 F.2d 1279 (7th Cir. 1992) (per curiam).
83 Id. at 1315. Easterbrook, Landes, and Posner use a similar typology, perhaps not surprisingly since Judge Easterbrook was a member of the panel in Amoco Cadiz. See Easterbrook, Landes & Posner, supra note 24, at 356-64. Polinsky and Shavell define only three rules—no contribution, contribution, and claim reduction. See Polinsky & Shavell, supra note 24, at 448. Their contribution rule assumes that a settling defendant is not protected from contribution actions. See id. at 458.
84 In an earlier Seventh Circuit decision, Donovan v. Robbins, 752 F.2d 1170 (7th Cir. 1984), Judge Posner defines three rules: (1) the traditional rule, (2) the traditional rule modified by not allowing contribution from a settling defendant, and (3) the comparative fault rule. Id. at 1180-81; see also Miller v. Christopher, 887 F.2d 902, 905 (9th Cir. 1989) (defining similar categories). Comparing these rules to those in the Amoco Cadiz case, the first corresponds to the contribution rule, the second corresponds to the contribution plus settlement bar rule, and the third corresponds to the claim reduction rule. Thus, even within a single circuit, there are serious inconsistencies in the nomenclature used to describe the various legal rules.
85 See Part I.A.5 supra.
86 See text accompanying notes 59-60 supra.
call the apportioned share set-off rule.\textsuperscript{87}

These categories are confusing for several reasons. First, the rules of contribution and contribution plus settlement bar implicitly assume that a settling defendant has the right to bring contribution actions. Indeed, under the former there is no limit to the reach of the contribution right, and under the latter the only limit is that a settling defendant cannot be sued. The assumption that a settling defendant can bring a contribution action is inconsistent with the approaches of the two model acts.\textsuperscript{88} More importantly, by conflating three elements—whether defendants found jointly and severally liable have a right to contribution, whether settling defendants have a right to contribution, and whether settling defendants are protected from contribution actions—into two categories, the Seventh Circuit’s approach diverts attention from the important question whether settling defendants can bring contribution actions.

Second, the claim reduction rule does not specify whether defendants can bring contribution actions (or be exposed to such actions) in the event that they both settle.\textsuperscript{89} If one of these defendants were to litigate, it could not be held liable for more than its apportioned share of the liability, since its liability would be reduced by the apportioned share of the settling defendant. At first glance, it might appear odd that this defendant would pay more in settlement. But if the plaintiff’s probability of prevailing is sufficiently high, litigation costs are sufficiently high, and the plaintiff has sufficient bargaining power to capture a great deal of the surplus produced by settlement, such a result could well ensue. A defendant that paid more than its apportioned share of the liability would then have a contribution claim, if the legal regime allowed such claims.\textsuperscript{90}

Here, the Seventh Circuit’s approach conflates two elements—the set-off rule, and the contribution rights and obligations of the settling defendants.\textsuperscript{91}

Third, the nomenclature is confusing with respect to the effects of a

\textsuperscript{87} See text accompanying notes 46-49 supra.

\textsuperscript{88} See text accompanying notes 66-67 supra (describing UCATA’s and UCFA’s denial of contribution to settling defendants).

\textsuperscript{89} Obviously, this question is not trivial, since the UCFA, which adopts an apportioned share set-off rule, specifies that settling defendants are protected from contribution actions and can maintain contribution actions only if the plaintiff’s claim against the other defendants is extinguished by the settlement. See text accompanying notes 66-67 supra. If the question of contribution actions between settling defendants under the apportioned share set-off rule never arises, it is unlikely that the UCFA would address it.

\textsuperscript{90} For a discussion of this problem, see Part I.A.6 supra; text accompanying notes 141-42 infra.

\textsuperscript{91} Because the question of contribution under the apportioned share set-off rule arises only if both defendants settle, a contribution action may be maintained only if two conditions hold: (1) the defendants have the right to bring such actions, and (2) they are not protected against such actions.
rule of contribution. As we have discussed, contribution among defendants found jointly and severally liable is consistent with using either the pro tanto set-off rule or the apportioned share set-off rule in the event that one of them settles. What the Seventh Circuit calls "contribution" is in fact a contribution rule with a pro tanto set-off rule and no contribution protection for settling defendants. What the Seventh Circuit calls "contribution plus settlement bar" is a contribution rule with a pro tanto set-off rule and contribution protection for settling defendants. What the Seventh Circuit calls "claim reduction" is a contribution rule with an apportioned share set-off rule. Here, the court's typology conflates two elements—whether there is a right of contribution and the nature of the set-off rule.

Fourth, the rule of no contribution is ambiguous as to what happens if the plaintiff settles with one defendant and litigates against the other. The implicit assumption seems to be that a pro tanto set-off rule would apply, so that the plaintiff could in sum recover its full damages if it prevails against the non-settling defendant. While this assumption is justified, the lack of explicit attention to this question detracts from the analytical clarity of the Seventh Circuit's approach.

Fifth, the Seventh Circuit's categories do not purport to deal with the manner in which contribution is determined (pro rata or on the basis of comparative fault), the nature of a good faith hearing under the pro tanto set-off rules, or joinder rules. These elements are all relevant to the analysis of the choice between settlement and litigation and therefore should be included in a taxonomy of possible legal rules.

II
THE CHOICE BETWEEN SETTLEMENT AND LITIGATION

In this Part, we analyze the settlement-inducing properties of one particular rule, which has the following eight components. First, joint and several liability applies. Second, there is a right of contribution among defendants held jointly and severally liable. Third, the contribution of each defendant is determined by reference to its comparative

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92 Not surprisingly, the courts are confused by all these terms. One court has stated that "the pro tanto rule is also known as the settlement bar rule." MFS Mun. Income Trust v. American Medical Int'l, Inc., 751 F. Supp. 279, 282 n.2 (D. Mass. 1990). As indicated in the text, the fact that the plaintiff's claim against the non-settling defendant is reduced by the amount of the settlement says nothing about whether the settling defendant is protected from contribution actions.

93 See text accompanying notes 52-53 supra.

94 See text accompanying notes 57-59 supra.

95 The analyses in Easterbrook, Landes & Posner, supra note 24, and Polinsky & Shavell, supra note 24, which have the same limitations, therefore do not capture the richness of the legal regime.
fault. Fourth, if the plaintiff settles with some defendants and litigates against others, its claim against the non-settling defendants is reduced by the amount of the settlement—a pro tanto set-off rule. Fifth, settling defendants are protected from contribution actions. Sixth, settling defendants are barred from bringing contribution actions. Seventh, there is no substantive judicial supervision of the settlement offers made by the plaintiff. Eighth, the plaintiff's claims against all of the defendants are joined together in a single proceeding.

We first specify the model that will guide our inquiry. We then analyze each party's choice between settlement and litigation when the plaintiff's probabilities of success against the defendants are independent. We next turn to the case of perfectly correlated probabilities. Then, we move away from these polar cases and consider the continuum between independent and perfectly correlated probabilities. Finally, we consider the extent to which the results depend upon the particular specifications in our model.

A. The Model

We consider an example in which a single plaintiff has a claim of $100 against two defendants, Row and Column, each equally at fault. All the parties are risk neutral, and the defendants are infinitely solvent. The probability that the plaintiff will prevail against each defendant is fifty percent. All the parties have accurate information about this value. We assume initially that the costs of litigation are zero.

The parties may either litigate or settle the claim. Settlement negotiations have the following structure. The plaintiff makes settlement offers to the two defendants; each knows the offer made to the other. Row and Column decide simultaneously whether to accept these offers. We assume that costs of coordinating their actions are sufficiently high that

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96 A person is risk neutral if she is indifferent between a lottery and its expected value. So, for example, she would be indifferent between bearing a risk herself and buying an insurance policy with a fair premium (equal to the expected value of the loss). A careful discussion of decisionmaking under risk is presented in David M. Kreps, A Course in Microeconomic Theory 71-132 (1990). For a definition of risk neutrality, see id. at 82.

97 Under our model, there is uncertainty about the defendant's liability (the plaintiff is not certain to prevail) but not about the defendant's shares of the fault or the plaintiff's damages. We deal briefly with uncertainty over shares at text accompanying notes 189-90 infra. Uncertainty over damages should not affect the analysis in the case of risk-neutral parties. Assume that there was a 50% probability that the plaintiff's damages were $150 and a 50% probability that they were $50; the expected value of the plaintiff's damages is $100. Risk-neutral parties will respond to this problem in the same way as to the problem described in the text, in which there is certainty that the damages are $100: they will be affected solely by the expected value of the damages and not by the probability distribution over the possible values. For a definition of risk neutrality, see note 96 supra; for a definition of expected recovery, see note 102 infra.

98 Later, we relax this assumption. See Part II.E.1 infra.
they act non-cooperatively. The plaintiff then litigates against the non-settling defendants, if any. We adopt the convention that if a party is indifferent between settlement and litigation, it settles. To keep the exposition comprehensible to readers without technical training, we proceed here by first providing a numerical example and then explaining the intuition for why the example is illustrative of some general propositions.

B. The Case of Independent Probabilities

Consider first the case of independent probabilities: the plaintiff's probability of success against one defendant is the same regardless of whether the plaintiff has prevailed against, lost to, or settled with the other defendant. Recall that the plaintiff has a fifty percent probability of prevailing against each of the defendants and that the plaintiff's damages are $100. As a consequence of joint and several liability, the plaintiff recovers its full damages not only if it prevails against both defendants but also if it prevails against one and loses to the other. Because the plaintiff's probabilities of success against the two defendants are independent, each of four different scenarios carries a probability of twenty-five percent: (1) that the plaintiff prevails against both defendants, (2) that the plaintiff prevails against Row and loses against Column, (3) that the plaintiff prevails against Column and loses against Row, and (4) that the plaintiff loses against both defendants. In the first three cases, carrying an aggregate probability of seventy-five percent, the plaintiff recovers its full damages of $100. Thus, its expected recovery from litigating against both defendants is $75.

The expected recovery from a litigation weighs each possible outcome of the litigation by the likelihood of that outcome and then sums these weighted recoveries. The expected recovery is thus the mathematical expectation of the distribution of outcomes presented by the litigation. On a frequency interpretation of probability, the expectation is simply the average payoff from a large number of (independent) repetitions of the risk (here, the litigation). For a philosophically informed discussion of the emergence of the concept of a mathematical expectation, see Ian Hacking, The Emergence of Probability 92-101 (paperback ed. 1984).

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100 The model in Polinsky & Shavell, supra note 24, at 469, also assumes take-it-or-leave-it offers, but there the defendants, rather than the plaintiff, make such offers. In Easterbrook, Landes & Posner, supra note 24, the bargaining model is not fully specified. It is not clear, for example, which parties make the initial offers or how many offers each party can make.

101 In Lewis A. Kornhauser & Richard L. Revesz, Multidefendant Settlements: The Impact of Joint and Several Liability, 23 J. Legal Stud. (forthcoming 1994), we provide formal proofs for the propositions discussed in Parts II.B and II.C. In this Article, in addition to presenting that argument in an accessible manner, in Part I we provide a typology to guide judicial thinking, in Part III we apply the conclusions of Part II to make comparisons about the settlement-inducing properties of the competing rules, and in Part IV we provide a critique of the judicial arguments concerning the choice of set-off rules.

102 The expected recovery from a litigation weighs each possible outcome of the litigation by the likelihood of that outcome and then sums these weighted recoveries. The expected recovery is thus the mathematical expectation of the distribution of outcomes presented by the litigation. On a frequency interpretation of probability, the expectation is simply the average payoff from a large number of (independent) repetitions of the risk (here, the litigation). For a philosophically informed discussion of the emergence of the concept of a mathematical expectation, see Ian Hacking, The Emergence of Probability 92-101 (paperback ed. 1984).
In turn, each defendant's expected loss is $37.50. Row has a fifty percent probability of prevailing and, therefore, of not having to pay anything. There is a probability of twenty-five percent that Row will lose and Column will win. In this case, Row has to pay the plaintiff's full damages of $100. Finally, there is a probability of twenty-five percent that Row and Column will both lose. Row then has to pay its share, $50, with Column paying the rest.103

A risk-neutral plaintiff will not accept a settlement with both defendants that yields less than $75, but it would find acceptable an aggregate settlement for $75 or more. What would happen if the plaintiff made settlement offers to the two defendants for $37.50 each, so that its aggregate recovery, if they accepted, would be equal to the expected recovery of litigating against both defendants? If one defendant, say Row, accepted the offer, would the other defendant accept it as well? Column would accept the settlement only if the expected loss from litigating is at least $37.50. Under the pro tanto set-off rule, Column's exposure in the event of litigation is reduced to $62.50: the plaintiff's damages of $100 minus Row's settlement of $37.50. But Column faces only a fifty percent probability of losing the litigation. Thus, in light of Row's settlement, Column's expected loss from litigation is only $31.25.

It therefore follows that if the plaintiff were to make offers of $37.50 to each defendant, at least one of them would reject the offer. If one defendant settles, the plaintiff's expected recovery would then be $68.75 (Row's settlement of $37.50 plus an expected recovery of $31.25 from litigating against Column). This amount is lower than the plaintiff's expected recovery from litigating against both defendants. Thus, the plaintiff would never make offers of $37.50 to each defendant.104

103 Under joint and several liability, if the plaintiff prevails against both Row and Column, it could satisfy its full judgment from one of the defendants. This defendant would then have to seek contribution from the other. In the absence of litigation costs, it does not matter whether the plaintiff seeks $50 from Row and $50 from Column, or whether, for example, it seeks $100 from Row, which then recovers $50 from Column in a contribution action, as long as the plaintiff's action and the contribution action are joined. We discuss the relevance of joinder in Part III.H infra.

104 Given that one defendant rejects the offer, the other would be indifferent between accepting it and rejecting it, since under both scenarios its expected loss is $37.50. Under our convention, the indifferent party would settle. Our convention, however, is here slightly at odds with the strategic structure of the situation. Though it is a Nash equilibrium for one party to settle and the other party to litigate, this equilibrium is somewhat implausible because, when transaction costs are zero, litigation is a weakly dominant strategy for each defendant—each defendant does at least as well by litigating, and sometimes it does better. Consequently, the Nash equilibrium in which both parties litigate is more plausible. Thus, litigation assures Row of an expected loss of no more than $37.50 regardless of Column's decision; if Column settles, Row's expected loss declines to $31.25.

The fact that, in response to offers of $37.50, both defendants might litigate is not inconsistent with the argument in the text: the plaintiff would not make offers of $37.50 to each
More generally, there is no pair of settlement offers that would be acceptable to the plaintiff and both defendants. There are three relevant classes of offers. First, the plaintiff could make an offer of $37.50 to one defendant and a lower offer to the other, make offers of less than $37.50 to both defendants, or make an offer of less than $37.50 to one defendant and more than $37.50 to the other, with these two offers adding to less than $75. If both defendants then accepted the offers, the plaintiff's recovery would be less than its expected recovery from litigating against both defendants.

Second, the plaintiff could make an offer of $37.50 to one defendant and a higher offer to the other, or it could make higher offers to both. Since at least one defendant preferred to litigate when they both received offers of $37.50, it follows that higher offers will make settlement even less attractive.105

Third, the plaintiff could make an offer of less than $37.50 to one defendant and an offer of more than $37.50 to the other, with the two offers adding to at least $75. Say that the plaintiff makes an offer of a to Row and ($75 - a) to Column, with the offers thus adding to $75.106 Assume initially that a is less than $37.50. What would Column do if Row accepted the offer of a? If Column litigated, it would face a fifty percent probability of having to pay the plaintiff's full damages of $100 minus Row's settlement of a; its expected loss would therefore be 0.5 times ($100 - a). This expected loss is lower than the settlement offer of ($75 - a) for any value of a that is less than $50. It thus follows that offers of a and ($75 - a), where a is less than $37.50, would not induce settlements with both defendants. Moreover, if a is greater than $37.50, then ($75 - a) is less than $37.50. As a result, if Column accepted the offer of ($75 - a), Row would not.

In summary, for the plaintiff to settle with both defendants, settlement must be advantageous to all three parties. There is no set of circumstances under which this would be the case. In the face of offers that are sufficiently attractive to the plaintiff, at least one defendant would prefer to litigate, and offers that the defendants would both be willing to accept are undesirable for the plaintiff.

A simple extension of the preceding discussion also establishes that

defendant if it believed that they would choose one of the equilibria in which one party settles. It is, therefore, weakly dominant for the plaintiff to make offers greater than $37.50 to each party. Such offers will present defendants with a game in which the unique equilibrium is for each to litigate. The concept of the Nash equilibrium is discussed in note 109 infra.

105 See note 106 infra.

106 If offers that add up to $75 do not induce acceptable settlements, offers that add up to a larger sum will not do so either. For example, if the pair of offers a and (75-a) does not induce a settlement, neither would offers of a and (80-a), which add up to $80. Settlement is relatively less desirable for Column and no more desirable for Row.
the plaintiff would not settle with one defendant. Assume that the plaintiff settles with Row and litigates against Column. Given that Column litigates, Row would be willing to settle as long as the offer is no greater than $37.50—its expected loss in the event of litigation. What happens if the plaintiff makes Row an offer of \( b \)? Its expected recovery from litigating against Column is then 0.5 times ($100 - b), or ($50 - 0.5b). Its total expected recovery (the settlement with Row of \( b \) plus its expected recovery from Column of ($50 - 0.5b)) is then ($50 + 0.5b). For the plaintiff's expected recovery from settling with Row and litigating against Column to be equal to at least $75 (the plaintiff's expected recovery from litigating against both defendants), \( b \) (the settlement paid by Row) must be at least $50. But, as already noted, given that Column litigates, Row will settle only if \( b \) is no greater than $37.50. Here, too, no offer acceptable to one defendant would give the plaintiff an expected recovery as high as its expected recovery from litigating against both defendants. As a result, the plaintiff will litigate against both defendants.

So far, we have provided only an example of this phenomenon. The skeptical reader might wonder what would happen if the defendants were not equally at fault, or if the plaintiff's probability of success against each of the defendants were not fifty percent. It is still the case that the plaintiff would litigate rather than settle. This phenomenon has two sources: (1) the surplus that the plaintiff obtains from litigation as a result of joint and several liability when its probabilities of success against the defendants are independent and (2) the benefit that a non-settling defendant receives from the set-off created by the plaintiff's settlement with the other defendant.

If the plaintiff were litigating against only one defendant rather than two, its expected recovery from litigation would be $50 rather than $75: it would have a fifty percent probability of recovering from that defendant its full damages of $100. Similarly, if the plaintiff were litigating against two defendants under non-joint (several only) liability, its expected recovery would also be $50: it would have a fifty percent probability of recovering $50 from each of the defendants. The lower recovery stems from the fact that if the plaintiff prevails against only one defendant, it does not recover its full damages of $100 but only the losing defendant's share of $50. Finally, if the plaintiff were litigating against two defendants under joint and several liability, but its probabilities of success against the defendants were perfectly correlated, it would also have an expected recovery of only $50. The perfect correlation of the probabilities implies that the plaintiff either prevails against both defendants or loses against both; in the former case, which carries a probability of fifty percent, it recovers its full damages of $100, whereas in the latter case it gets nothing.
As a result of the surplus that the plaintiff obtains from litigating against both defendants under joint and several liability when its probabilities of prevailing are independent, the plaintiff will not accept from one defendant a settlement that is too low even if the plaintiff intends to litigate against the other. Say, for example, that the plaintiff accepted a settlement of $0 from Row and litigated against Column. Its expected recovery would then be only $50 (a fifty percent probability of recovering $100); the settlement with Row will have reduced its expected recovery by $25. If the plaintiff accepted a settlement of $10 from Row, its expected recovery from litigating against Column would be $45 (a fifty percent probability of recovering $90), for a total expected recovery of $55; the loss from the low settlement with Row is $20.

So as not to lose its surplus, the plaintiff would thus have to demand a sufficiently high settlement from Row. But a settlement that is sufficiently desirable for the plaintiff to accept confers a benefit upon Column. If, for example, the plaintiff were to settle with Row for $25, Column’s expected loss from litigation would be $37.50—the same expected loss as if Row litigated. Any higher settlement with Row reduces Column’s expected loss. We have already shown that a settlement with Row for $37.50 reduces Column’s expected loss from $37.50 to $31.25, giving it a benefit of $6.25. In order to recover $75, the plaintiff would have to obtain from Row a settlement of $50 (which would leave an expected recovery from Column of $25 and thus confer upon Column a benefit of $12.50). Row, however, would not agree to such a settlement because, given that Column litigates, it is better off litigating as well and facing an expected loss of only $37.50.

We have thus illustrated why the plaintiff cannot capture the full benefit of Row’s settlement if its probabilities of success are independent. Part of this settlement confers an external benefit upon Column. It is this externality that stands in the way of settlement. Indeed, the only way that the plaintiff can obtain the full benefit of a defendant’s payment is by litigating, because if it settles, part of the benefit accrues to the other defendant.

C. The Case of Perfectly Correlated Probabilities

The problem changes considerably if the plaintiff’s probabilities of success against both defendants are perfectly correlated: if the plaintiff litigates against both defendants, it either prevails against both (with a probability of fifty percent) or loses against both (also with a probability

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107 Easterbrook, Landes & Posner, supra note 24, at 356-57, and Polinsky & Shavell, supra note 24, at 451-52, 470, assume implicitly that the plaintiff’s probabilities of success are perfectly correlated. Thus, they overlook the central importance of the correlation of the plaintiff’s probabilities of success.

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of fifty percent). Its expected recovery from litigation is $50 rather than $75; each defendant's expected loss is then $25.

In the case of perfectly correlated probabilities, the plaintiff will settle with both defendants. It is easy to see that the plaintiff will settle with at least one of the defendants. Say that the plaintiff settles with Row for $10, it faces a fifty percent probability of recovering $90 from Column, and thus its total expected recovery is $55—$5 higher than its recovery from litigating against both defendants. The effect of this settlement is to give the plaintiff $10 with certainty but reduce its expected recovery from litigation by $5. As a result, the plaintiff's settlement with one defendant and litigation against the other is always more attractive to the plaintiff than litigation against both.

In fact, in this example, the plaintiff will settle with both defendants, obtaining $25 from one, say Row, and $37.50 from the other. In the face of a settlement of $25 with Row, Column faces an expected loss from litigation of $37.50 and is therefore willing to pay that amount in settlement. In turn, in the face of a settlement of $37.50 with Column, Row faces an expected loss from litigation of $31.25108 and therefore prefers to pay $25 in settlement. The plaintiff's total recovery of $62.50 is $12.50 higher than its expected recovery from litigating against both defendants.

Two questions might arise at this point. First, why is it not possible for the plaintiff to extract more than $25 out of Row, given that Row's expected loss from litigation is higher? Second, why does the plaintiff settle for different amounts with the two defendants, even though they have responsibility for equal shares of the liability?

If the plaintiff were to make equal offers to both defendants, the largest amount that it could extract in settlement is $33.33 from each defendant. If Row accepted this offer, Column would face an expected loss in litigation of $33.33 (a fifty percent probability of losing $66.67) and would therefore choose to settle. The same logic shows that if Column accepted the offer, Row would accept it as well. Thus, the pair of $33.33 offers produces an outcome in which settlement with both defendants, yielding the plaintiff a recovery of $66.66, is an equilibrium solution.109 This recovery is the largest that the plaintiff can obtain if it

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108 See text accompanying notes 103-04 supra.
109 The Nash equilibrium is the primary solution concept used in the theory of non-cooperative games in normal form. In this context, each player selects a strategy from her set of possible strategies. (In our game, there are two players, Row and Column, and each has available two strategies—settle and litigate.) In a Nash equilibrium, no player in the game has a (unilateral) incentive to change her strategy choice. Put differently, each player is doing the best she can, given that all other players continue to follow their equilibrium strategies. For a lucid, non-technical discussion of Nash equilibria, see David M. Kreps, Game Theory and Economic Modelling 28-36 (1990).
settles with both defendants.110

Consider now what would happen if Row rejected the offer of $33.33 and chose to litigate. Column's expected loss through litigation would be only $25 (a fifty percent probability of splitting with Row the plaintiff's damages of $100); Column would therefore reject the offer as well. The same logic shows that if Column rejected the offer, Row would also reject it. Thus, the pair of $33.33 offers produces an outcome in which litigation with both defendants, yielding the plaintiff an expected recovery of only $50, is also an equilibrium solution.111

To avoid the possibility that both defendants would reject its offers, the plaintiff makes the offers of $25 and $37.50 to Row and Column, respectively. Litigation with both defendants would then not ensue because if Column were to litigate, Row, which would face an expected loss of $25 if it litigated, would choose to settle. Thus, offering one of the defendants a settlement of $25 is necessary to eliminate the possibility of an equilibrium in which both defendants litigate.

The result that perfectly correlated probabilities induce the parties to settle is not dependent on the particular value of the plaintiff's probability of success that we used in the example. For any value of this probability, the plaintiff is always better off by settling with at least one defendant. Moreover, the reasoning presented above for why the plaintiff settles with both defendants extends to any value of the plaintiff's probability of success.

With respect to the defendants' shares of the liability, the result derived in this Section also extends to instances in which the defendants are not equally at fault. It is easy to make small changes in the defendants' relative faults and still show that both settle.

If the defendants' shares of the liability were sufficiently different, however, the plaintiff would settle with the defendant that had the greater fault, say Column, and litigate against the other. Consider a case in which Row's share of the liability is twenty-five percent and Column's is seventy-five percent. The plaintiff would then settle with Column for $37.50 and litigate against Row with an expected recovery of $31.25 (a fifty percent probability of recovering its damages of $100 minus Column's settlement of $37.50);112 its total expected recovery would therefore be $68.75. Given that Row litigates, if Column were to litigate as

110 See Kornhauser & Revesz, supra note 101.

111 Easterbrook, Landes & Posner, supra note 24, overlooks the existence of these multiple equilibria and assumes, incorrectly, that the defendants would necessarily settle for the same amounts. See id. at 356-58. Polinsky & Shavell, supra note 24, at 470-71, considers the possibility of multiple equilibria.

112 Our model assumes that the plaintiff makes simultaneous offers to both defendants. Here, it would make Row an offer of more than $31.25 so that Row would refuse it.
well, its expected loss would be $37.50 (a fifty percent probability of hav-
ing to pay seventy-five percent of $100). Column would settle as long as
the settlement offer is no greater than this amount.\textsuperscript{113} Note that if in-
stead of litigating against Row, the plaintiff settled with it for $31.25,
Column would face an expected loss of $34.37 (a fifty percent probability
of paying the plaintiff’s damages of $100 minus Row’s settlement of
$31.25) if it litigates, and would thus not be willing to settle for $37.50.
As a result, the plaintiff is better off litigating against Row.

In summary, when the plaintiff’s probabilities of success are per-
fectly correlated, the problem is quite different than when the probabili-
ties are independent. Whereas in the latter case, the plaintiff litigates
against both defendants, in the former case it does not. Instead, the
plaintiff settles with both defendants if their shares of the liability are
sufficiently similar, and it settles with one defendant—the one with the
larger share of the liability—and litigates against the other if the defend-
ants’ shares of the liability are sufficiently different.

\textbf{D. The Continuum Between Independent and Perfectly
Correlated Probabilities}

While the cases of independent and perfectly correlated probabilities
are paradigmatic, generally litigation will fall somewhere in the contin-
uum between these two extremes. The hazardous waste example dis-
cussed above might raise two issues: whether each of two defendants
sent hazardous substances to the site, and whether the plaintiff’s clean-
up was appropriate. For the first issue the plaintiff’s probabilities of suc-
cess are independent, whereas for the second issue they are perfectly cor-
related. To obtain relief, the plaintiff must prevail on the second issue,
and it must also prevail on the first issue against at least one defendant.
For the case as a whole, its probabilities of success are neither independ-
et (because of the second issue) nor perfectly correlated (because of the
first issue).

\textsuperscript{113} If, in contrast, the plaintiff litigated against Column, Row’s expected loss from litigation
would be $12.50 (a 50% probability of having to pay 25% of the plaintiff’s damages of $100); Row
would pay no more than this amount in settlement. Column’s expected liability would
then be $43.75 (a 50% probability of having to pay $87.50). Thus, if the plaintiff settled with
Row and litigated against Column, its total expected recovery would be only $56.25.

If the plaintiff settled with both defendants, the best it could do would be to obtain $33.33
from each, for a total recovery of $66.66—less than its recovery from settling with Column and
litigating against Row. As indicated above, if one defendant, say Row, accepts an offer of
$33.33, the other defendant’s expected loss from litigation is $33.33 (a 50% probability of
having to pay $66.67). Column would thus be willing to accept a settlement of $33.33. Note
that in this instance the plaintiff does not face the risk that offers of $33.33 to Row and Col-
umn, respectively, would induce both defendants to litigate rather than settle. See text accom-
panying notes 107-13 supra. If Row litigated, Column’s expected loss from litigation would be
$37.50 (a 50% probability of having to pay 75% of the plaintiff’s damages of $100).
Our conclusion that for independent probabilities the plaintiff litigates against both defendants also applies when these probabilities are somewhat correlated. The effect of some correlation is to reduce the surplus that the plaintiff obtains from litigating against both defendants. (Recall that when the probabilities are perfectly correlated, this surplus disappears altogether.\textsuperscript{114}) As the surplus gets smaller, the plaintiff is willing to accept lower settlements. In turn, a lower settlement on the part of one defendant results in a smaller external benefit for the other defendant. At some threshold, the externality disappears, and the result that the plaintiff litigates against both defendants no longer holds. But for correlations lower than this threshold, the results are identical to those that arise in the case of independent probabilities.\textsuperscript{115}

Similarly, our conclusion that the plaintiff settles with at least one defendant when its probabilities of success are perfectly correlated also applies when the correlation is less than perfect. The effect of a lower correlation is that the plaintiff’s expected recovery from litigating against one defendant is no longer identical to its expected recovery from litigating against both defendants. Thus, by settling with one defendant, the plaintiff pays a price. At some point, this price is high enough that the settlement becomes unattractive.\textsuperscript{116}

\textit{E. The Relevance of the Model’s Assumptions}

The central conclusions of Part II.B and C are that for independent probabilities the plaintiff litigates against both defendants, and for perfectly correlated probabilities the plaintiff settles with at least one defendant. The model that we used to establish these results made several assumptions. We discuss in this Section whether any of these results would be different if those assumptions were relaxed.

\textsuperscript{114} See text accompanying notes 107-08 supra.
\textsuperscript{115} See Kornhauser \& Revesz, supra note 101.
\textsuperscript{116} See id. The plaintiff’s probabilities of success can also be negatively correlated: perfect negative correlation means that the plaintiff either wins against Row and loses to Column or vice versa. The plaintiff’s expected recovery from litigation is then $100—it recovers its full damages with certainty. Could the plaintiff settle with each of the defendants for $50? If one of the defendants, say Row, accepted the offer, the other would have an expected loss through litigation of only $25 (a 50\% probability of paying the plaintiff’s full damages of $100 minus the settlement of $50). As a result, the plaintiff would never make offers of $50 to each of the defendants.

Row’s settlement confers an external benefit of $25 on Column. Like in the case of independent probabilities, this externality precludes settlements. Note, moreover, that the externality is larger for negatively correlated probabilities than it is for independent probabilities. See text accompanying notes 103-04 supra (for independent probabilities, the corresponding benefit is only $6.25).
1. Litigation Costs

To simplify the exposition, we assumed that the costs of litigation were zero. In the real world, of course, litigation is expensive. Litigation costs have the effect of inducing settlement because the plaintiff and defendants can save these outlays, and divide them among each other in some fashion, if they decide not to litigate. Take a simple one-defendant case in which the plaintiff has a fifty percent probability of obtaining $100 in damages. In the absence of litigation costs, the parties are indifferent between litigating and settling for $50; no other settlement amount would be mutually acceptable. If instead each party faced litigation costs of $10, the plaintiff would be willing to accept $40 or more in settlement, and the defendant would be willing to pay $60 or less. Thus, both parties will prefer a settlement of between $40 and $60 to litigation. Litigation costs create a surplus that the parties can divide among themselves if they settle.

Our result that under independent probabilities the plaintiff litigates against both defendants holds when the costs of litigation are zero as well as when they are positive but sufficiently small. When litigation costs exceed a certain threshold, however, the plaintiff settles with both defendants. In the case of perfectly correlated probabilities, to the extent that settlement is the chosen option in the absence of litigation costs, it is even more desirable when such costs are present.

2. Risk Aversion

We also assumed that the parties are risk neutral. Risk aversion promotes settlement because it makes the certainty of a settlement relatively more desirable than the expected value of litigation. Return to the simple one-defendant case. If the plaintiff is risk averse, it prefers the certainty of a settlement of $50 to a fifty percent probability of obtaining $100 in litigation. The higher the plaintiff's degree of risk aversion, the lower the amount that it would be willing to accept to forgo litigation. Similarly, if the defendant is risk averse, it prefers the certainty of a settlement of $50 to a fifty percent probability of having to pay $100. The higher the defendant's degree of risk aversion, the higher the amount that it would be willing to pay to forgo litigation. Risk aversion, like litigation costs, creates a surplus that the parties can divide among themselves if they settle.

Our conclusion that under independent probabilities the plaintiff lit-
igates against both defendants holds for risk-neutral parties and also for some range of risk aversion. When the level of risk aversion exceeds a certain threshold, however, the plaintiff settles with both defendants. In the case of perfectly correlated probabilities, to the extent that settlement is the chosen option for risk-neutral parties, it is even more desirable for risk-averse parties.

3. Informational Inaccuracies

We have assumed throughout that all the parties have accurate information about the plaintiff's probabilities of success. There are two other relevant scenarios. The beliefs of a plaintiff and a defendant are pessimistic when a plaintiff's estimate of its probability of success is lower than the defendant's estimate of the plaintiff's probability of success. Conversely, the beliefs of the parties are optimistic when a plaintiff's estimate of its probability of success is higher than the defendant's estimate of the plaintiff's probability of success. As we illustrate below, pessimism promotes settlement, whereas optimism discourages settlement.118

Return now to the one-defendant example, in which the plaintiff's true probability of prevailing is fifty percent, its damages are $100, and there are no litigation costs. Assume that the parties are pessimistic: the plaintiff believes that its probability of success is forty percent, and the defendant believes that the plaintiff's probability of success is sixty percent. The plaintiff would then be willing to accept any settlement of at least $40, and the defendant would be willing to pay up to $60. Conversely, it is easy to see that if the parties were optimistic there would be no settlement.

Our result that under independent probabilities the plaintiff litigates against both defendants holds for parties with accurate information as well as for parties that are somewhat pessimistic. When the level of pessimism exceeds a certain threshold, however, the plaintiff settles with both defendants. In the case of perfectly correlated probabilities, to the extent that settlement is the chosen option for parties with accurate information, it is even more desirable for pessimistic parties. Conversely, a sufficiently high degree of optimism would lead to litigation with both defendants even in the case of perfectly correlated probabilities.

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118 In all these situations, each party knows the other party's assessment of the plaintiff's probabilities of success. For an economic analysis of the effects of informational asymmetries when a plaintiff litigates against a single defendant (asymmetries that generally increase the likelihood of litigation), see Lucian A. Bebchuk, Litigation and Settlement Under Imperfect Information, 15 RAND J. Econ. 404 (1984); Barry Nalebuff, Credible Pretrial Negotiation, 18 RAND J. Econ. 198 (1987).
4. Structure of the Settlement Negotiations

We assumed that the plaintiff makes take-it-or-leave-it offers to the defendants. As a result of this assumption, the plaintiff captures the full surplus, if any, from settlement. For example, in the one-defendant case in which each party faces $10 in litigation costs, if the plaintiff is able to make a take-it-or-leave-it offer, it would ask, and obtain, $60. In contrast, if the defendant is able to make such an offer, it would settle for only $40. If neither party is able to make a take-it-or-leave-it offer, the settlement will be somewhere between $40 and $60. In the absence of litigation costs, however, the structure of the settlement negotiations is not material. Regardless of who makes a take-it-or-leave-it offer in this example, the plaintiff will not settle for less than $50 and the defendant will not pay more than $50.

More generally, the assumption that one party can make a take-it-or-leave-it offer does not affect the existence or size of a settlement range: it affects only the manner in which the surplus is divided among the parties. Thus, neither of our central conclusions are affected by the assumption that the plaintiff can make take-it-or-leave-it offers.

5. Timing of the Plaintiff’s Offers

We also assumed that the defendants decide simultaneously whether to accept the plaintiff’s offer. Neither of our central conclusions turns on this assumption. Recall that, in the case of independent probabilities, for a settlement with one defendant to be advantageous to the plaintiff, it must be for at least $50; then, the expected value of the plaintiff’s claim against the other defendant is $25 (a fifty percent probability of recovering $50). Say that the plaintiff makes Row an offer of $50, and, if Row rejects it, the plaintiff then makes Column an offer of $50. Row would reject the offer because its expected loss if Column accepts the offer is $25, and its expected loss if Column rejects the offer is $37.50 (half of the plaintiff’s expected recovery of $75); both these expected losses are less than the settlement offer. In turn, Column rejects the offer as well because the resulting expected loss of litigating, given that Row also litigates, is only $37.50.

The case of perfectly correlated probabilities is also straightforward. Say that the plaintiff first makes Row a settlement offer. If Row rejects it, the plaintiff will want to settle with Column for whatever Column is willing to pay because, when its probabilities of success are perfectly correlated, its expected recovery from litigation is the same regardless of whether it litigates against both Row and Column or only against Row. Thus, if Row rejects the initial offer, the plaintiff will make Column a

119 See text accompanying notes 106-07 supra.
settlement offer of $25—its expected value of litigation given that Row also litigates. When Column accepts this offer, the plaintiff’s expected recovery from Row is $37.50 (a fifty percent probability of recovering its full damages of $100 minus Column’s settlement of $25). Because Row knows at the outset that this will be its fate if it rejects a settlement offer, it will be willing to settle for $37.50. Thus, as in the case of simultaneous offers, the plaintiff settles with one defendant for $37.50; the other defendant faces a fifty percent probability of being liable for $62.50 and settles for $31.25.

6. Knowledge of the Offers

We assumed that both defendants know the amounts of the plaintiff’s offers. Even if they did not, the plaintiff would litigate against both defendants if its probabilities of success are independent. How would a defendant, say Row, react to an offer of $37.50 if it did not know the amount of the other offer? It could surmise that the other offer would be for no less than $37.50, because it would be irrational for the plaintiff to make offers that summed to less than its expected value of litigation. Thus, it would reject the offer because if Column also rejected the offer its expected loss would be $37.50; but if Column accepted the offer its expected loss would be less as a result of the external benefit provided by the settlement. Because the defendants would reject offers of $37.50, it follows that they would reject higher offers as well.

In the case of perfectly correlated probabilities, the plaintiff can always extract a settlement of at least $25 from one of the defendants, say Row. Indeed, if Column does not settle, Row’s expected loss from litigation is $25 (a fifty percent probability of paying $50). If Column does settle, Row’s expected loss from litigation is more than $25 unless Column’s settlement is for at least $50; Row’s expected loss would then be $25 (a fifty percent probability of paying the plaintiff’s damages of $100 minus Column’s settlement of $50). Column, however, would not accept a settlement offer of $50. This amount is greater than its expected loss from litigation regardless of whether Row litigates or settles; in the latter case, Column’s expected loss is $50 only in the implausible case that Row’s settlement is for $0. As a result, regardless of what Column does, it is in Row’s interest to accept a settlement offer of $25. Thus, even if the defendants do not know each other’s offers, at least one of them will settle when the plaintiff’s probabilities of success are perfectly correlated.

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120 In the case of sequential offers, however, the first settlement must be made public since, under the pro tanto set-off rule, it affects the plaintiff’s claim against the other defendant.

121 See note 106 supra.
7. Solvency

We assumed that the defendants are fully solvent. In the context of joint and several liability, a defendant's solvency is limited if it has insufficient resources to pay the plaintiff's full damages. When the plaintiff's probabilities of success are independent, if Row has solvency of less than $100, it will not be able to pay the plaintiff's full damages in the event that it loses and Column prevails. As a result, limited solvency reduces the plaintiff's expected recovery in the event that it litigates against both defendants. We showed, however, that in the case of independent probabilities, the plaintiff receives a surplus from litigating against both defendants: if it settles with both, the maximum settlements that the defendants would pay are smaller than the plaintiff's expected recovery from litigating against both defendants. The effect of a defendant's limited solvency is to reduce this surplus, but, unless the defendant's solvency is sufficiently low, it will not eliminate the surplus altogether. Thus, our conclusion that the plaintiff litigates against both defendants when its probabilities of success are independent holds not only when the defendants are fully solvent but also when their solvencies, though limited, are above a given threshold.

The effects of limited solvency are less straightforward when the plaintiff's probabilities of success are perfectly correlated. We show elsewhere that limited solvency on the part of the defendants can either induce settlements that otherwise would not occur or deter settlements that otherwise would occur. Nonetheless, when the solvency of the defendants is above a threshold, the plaintiff settles with at least one defendant, just as it does when the defendants are fully solvent.

The plaintiff's insolvency can also have important effects. Limited solvency on the part of the plaintiff plays no role if litigation costs are zero. The plaintiff then does not need to advance any money to pay for the litigation, and the level of its solvency therefore does not affect its strategy. Typically, however, litigation costs must be expended before the plaintiff recovers a judgment. If these costs are positive, the plaintiff might not have sufficient money to undertake the litigation, even though its expected recovery from litigating could exceed by a great deal its costs of bringing the actions. If capital markets operated efficiently, for example through the existence of contingency fee arrangements, the plaintiff

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122 If Row's solvency is less than $50, it will not be able to pay its full share of the damages in the event that the plaintiff prevails against both defendants.
124 See id.
125 See id.
could simply borrow the money necessary to finance the litigation. Otherwise, however, the plaintiff would face an incentive to enter into an otherwise undesirable settlement with one defendant in order to finance its litigation against the other.\textsuperscript{126}

8. Non-Cooperative Action by the Defendants

We assumed that the defendants act non-cooperatively in responding to the plaintiff's offers. Consider what would happen if the defendants were able to enter into agreements to coordinate their actions in a situation in which the plaintiff makes take-it-or-leave-it offers. In the case of independent probabilities, if the plaintiff made offers of $37.50 to each defendant, they could agree to have one of them accept the offer and the other reject it: as indicated above,\textsuperscript{127} the plaintiff's expected recovery would then be $68.75. So, the plaintiff would not make these offers even if the defendants could coordinate their action. In contrast, if the defendants could both coordinate their actions and make take-it-or-leave-it offers, and they each offered the plaintiff $37.50, the plaintiff's recovery from this settlement would be equal to its expected recovery from litigation and it would therefore settle. The plaintiff, of course, would not accept less than $75—its expected recovery from litigating.\textsuperscript{128}

In the case of perfectly correlated probabilities, if the defendants could coordinate their actions, they would each reject any offer of more than $25—their expected liability at trial. The plaintiff would make offers of $25 to each, which would yield it the same expected recovery as litigating against both.

9. Number of Defendants

So far, our analysis has been restricted to two defendants. Our central conclusions hold as well for more defendants, however. Consider, first, the situation in which the plaintiff's probabilities of success are independent. When there are three defendants, the plaintiff recovers its full damages of $100 except when it loses against all of the defendants. The probability of this occurrence is 12.5 percent. Thus, the plaintiff's expected recovery is $87.50.\textsuperscript{129} What would happen if the plaintiff of-

\textsuperscript{126} For further discussion of the costs of this course of action, see Part IV.A.1 infra.

\textsuperscript{127} See text accompanying notes 103-04 supra.

\textsuperscript{128} Settlement would also occur if the plaintiff could make its settlement offers contingent on both defendants accepting them; if either defendant rejected the offer, both would be deemed rejected. Offers of $37.50 would then be accepted by both defendants. As a practical matter, however, this result is dependent upon cooperation between the defendants. In the event that neither party is able to make take-it-or-leave-it offers, offers from the plaintiff produce counteroffers from the defendants, which would need, at this stage, to coordinate their actions.

\textsuperscript{129} The surplus that the plaintiff obtains from litigating under joint and several liability
fered each of the defendants a settlement of $29.17 (one-third of $87.50)? Assume that the first two defendants accept the offers. If the third litigated, it would face a fifty percent probability of paying $41.66 (the plaintiff's full damages of $100 minus the two settlements for $29.17 each). Its expected loss of $20.83 therefore is less than the settlement offer. Thus, this defendant would reject the offer. As a result, as in the case of two defendants, the plaintiff would not make such offers because they lead to a smaller expected recovery than it can obtain by litigating.\textsuperscript{130}

In the case of perfectly correlated probabilities, the plaintiff always settles with at least one defendant. Such a settlement does not reduce its expected recovery from litigation and thus is always in its interest.\textsuperscript{131}

10. \textit{Summary}

The central results of our model are that the plaintiff will litigate against both defendants if its probabilities of success are independent, and that the plaintiff will settle with at least one defendant if its probabilities of success are perfectly correlated.\textsuperscript{132} These results are not dependent on many of the assumptions that we made in order to simplify the exposition. They apply not only when litigation costs are zero but also when they are positive, not only when the parties are risk neutral but also when they are risk averse, not only when the parties have accurate information but also when they are pessimistic and optimistic, not only when the plaintiff makes take-it-or-leave-it offers but also when the defendants do so, not only when the defendants decide simultaneously whether to accept the plaintiff's offers but also when they decide sequentially, not only when the settlement offers are known by the two defendants but also when they are not, not only when the defendants are fully solvent but also when their solvencies are limited, and not only when there are two defendants but also when there are more.

Significantly, however, our conclusions do depend on the assumption that the defendants act non-cooperatively. Otherwise, regardless of the correlation of the plaintiff's probabilities of success, in the absence of litigation costs the parties would be indifferent between settlement and litigation, and for any level of litigation costs they will prefer to settle.\textsuperscript{133}

We believe that non-cooperative action is common. Indeed, although

\textsuperscript{130} A full analysis of this problem is beyond the scope of this Article.
\textsuperscript{131} See text accompanying notes 107-08 supra; see also Easterbrook, Landes & Posner, supra note 24, at 358-63.
\textsuperscript{132} See Part II.C supra.
\textsuperscript{133} See Part II.E.8 supra.
defendants in multi-party cases sometimes retain joint representation, they typically do not relinquish to the joint representative the authority to accept offers on their behalf. Moreover, in order for cooperation agreements to work, the defendants must enter into detailed contracts. These contracts must specify not only what joint offers the defendants would make but also how they would respond to any counteroffers by the plaintiff. Casual observation suggests that such agreements are not common, indicating that the costs of drafting them must be very high.

III
EXTENDING THE ANALYSIS TO DIFFERENT LEGAL REGIMES

So far, we have analyzed the problem under one particular legal rule: joint and several liability, a right of contribution, contribution being determined by reference to comparative fault, pro tanto set-off, contribution protection for settling defendants, no contribution rights for settling defendants, no substantive judicial supervision of the settlement offers, and joinder. In this Part, we study the effects of varying each of these components.

We perform this analysis by changing the components one at a time, so that the effect of each choice can be properly isolated. Our analysis also makes possible the comparison of any two legal regimes, and we make explicit many comparisons that vary more than one component at any time. Thus, for example, in Part II we studied a rule of joint and several liability, with contribution and pro tanto set-off. Here we compare non-joint liability both to that rule and to joint and several liability, with contribution and apportioned share set-off.

A. The Set-Off Rule

Under the pro tanto set-off rule, if the plaintiff settles with one defendant and litigates against the other, its claim against the non-settling defendant is reduced by the amount of the settlement. Under the apportioned share set-off rule, in contrast, the plaintiff’s claim is reduced by

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134 The proposition that any level of litigation costs will cause the defendants to settle relies on the assumption that the defendants can cooperate without expending coordination costs. Otherwise, the defendants will settle only if the litigation costs are sufficiently high compared to the coordination costs.

135 For a discussion of how the plaintiff could defeat attempts on the part of the defendants to cooperate, see Easterbrook, Landes & Posner, supra note 24, at 360, 365-66.

136 The legal regime we model is characterized by eight elements, and each has at least two alternatives. It would therefore appear that there are more than $2^8$—that is, 256—different rules. In fact, the number is somewhat smaller. For example, the need for a “good faith” hearing arises only if there is a right of contribution, with pro tanto set-off and contribution protection for settling defendants. See text accompanying notes 74-75 supra.
the settling defendant's apportioned share of the liability.\textsuperscript{137}

The difference between these two set-off rules does not affect either the plaintiff's expected recovery or the defendants' expected loss in the event that the plaintiff litigates against both defendants. It does, however, affect the plaintiff's recovery not only when it settles with one defendant and litigates against the other, but also when it settles with both, since the maximum settlement that one defendant will be willing to pay is equal to its expected loss in litigation, and the expected loss is a function of the set-off rule.

Consider once again the simple example developed in Part II,\textsuperscript{138} first when the plaintiff's probabilities of success are independent. What happens under the apportioned share set-off rule when the plaintiff makes offers of $37.50 to Row and to Column? If Row accepted the offer, the plaintiff's expected recovery from Column would be only $25: in the event that it prevails—an outcome carrying a probability of fifty percent—it recovers its full damage of $100 minus Row's apportioned share of $50. The plaintiff's total expected recovery would then be $62.50. This amount is less than both its expected recovery of $68.75 from settling with one defendant and litigating against the other under the pro tanto set-off rule, and its expected recovery of $75 from litigating against both defendants under either set-off rule.

As a result, under the apportioned share set-off rule, as under the pro tanto set-off rule, the plaintiff would not make offers of $37.50 to each defendant when its probabilities of success are independent. Instead, it would litigate. The explanation for this result is the same for the apportioned share set-off rule as for the pro tanto set-off rule. For both set-off rules, the plaintiff obtains a surplus from litigating against both defendants under joint and several liability when its probabilities of success are independent, as compared to its recovery in the one-defendant case, in the two-defendant case under non-joint liability, or in the two-defendant case under joint and several liability when its probabilities of success are perfectly correlated.

Moreover, under the apportioned share set-off rule, any settlement with Row, regardless of the amount, reduces Column's expected liability from $37.50 (its expected loss from litigation if Row also litigates) to $25 (its expected loss from litigation if Row settles, which consists of a fifty percent probability of being liable for the plaintiff's damages of $100 minus Row's apportioned share of $50). As a result, Row's settlement confers an external benefit on Column. Once again, it is this externality that induces the plaintiff to litigate against both defendants.\textsuperscript{139}

\textsuperscript{137} See text accompanying notes 45-49 supra.

\textsuperscript{138} See text accompanying notes 96-101 supra.

\textsuperscript{139} See Part II.B supra.
In fact, when Row settles for its expected loss from litigation in the event that both defendants litigate, it confers a larger benefit upon Column under the apportioned share set-off rule. Recall that under the pro tanto set-off rule, a settlement with Row for $37.50 reduced Column’s expected loss from $37.50 to $31.25, conferring upon it a benefit of $6.25. Under the apportioned share set-off rule, Column’s expected loss is reduced from $37.50 to $25—Row’s settlement thereby confers upon Column a benefit of $12.50.

As a result, the maximum settlement that the plaintiff could extract from both defendants is lower under the apportioned share set-off rule. This difference implies that, when the plaintiff’s probabilities of success are independent and litigation costs are zero, the apportioned share set-off rule discourages settlement. It is true that for risk-neutral parties with accurate information, both rules will lead the plaintiff to litigate against both defendants. Moreover, for sufficiently risk-averse parties, or sufficiently pessimistic parties, both rules will lead the plaintiff to settle with both defendants. There is, however, an intermediate range of risk aversion and pessimism for which the pro tanto set-off rule would lead the plaintiff to settle with both defendants, whereas the apportioned share set-off rule would lead the plaintiff to litigate against both defendants.

The results are different when litigation costs are sufficiently high. One feature of the pro tanto set-off rule is that when the plaintiff settles with one defendant and litigates against the other, it cannot recover more than its full damages. Under the apportioned share set-off rule, in contrast, if the plaintiff is able to extract from one defendant more than that defendant’s apportioned share, its claim against the other defendant is reduced only by that defendant’s apportioned share. Thus, if the plaintiff prevails in the litigation, its recovery from the litigating defendant and its settlement with the other defendant sum to more than its damages.

When litigation costs are sufficiently high, the plaintiff can extract in settlement more than a defendant’s apportioned share because, by settling, the defendant saves its litigation costs. In turn, given that one defendant settles for more than its apportioned share, the other defendant would be prepared to settle for more under the apportioned share set-off rule than under the pro tanto set-off rule, because it is exposed to higher damages under the former if it litigates and loses.

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140 We do not consider the possibility that litigation costs would be different under the two set-off rules. If one rule had higher litigation costs this factor would push in the direction of settlements, because it would create an additional incentive for the parties to settle rather than litigate, but this factor could be outweighed by other factors.

141 See text accompanying notes 53-55 supra. But see text accompanying note 56 supra (discussing constrained version of apportioned share set-off rule).
Thus, for sufficiently high litigation costs, the plaintiff gets a larger surplus from settlement under the apportioned share set-off rule than under the pro tanto set-off rule. Under this condition, the apportioned share set-off rule encourages settlement. Both rules would lead the plaintiff to settle with the two defendants when all the parties have accurate information. Moreover, if the parties are sufficiently optimistic, both rules would lead the plaintiff to litigate against the two defendants. There is, however, an intermediate range of optimism for which the apportioned share set-off rule would lead the plaintiff to settle with both defendants, whereas the pro tanto set-off rule would lead the plaintiff to litigate against both defendants. In summary, when the plaintiff's probabilities of success are independent, the pro tanto set-off rule has a settlement-inducing effect when litigation costs are low, but a settlement-deterring effect when litigation costs are high.

To prevent confusion, it is important to clarify the conditions under which this latter conclusion holds. The apportioned share set-off rule has better settlement-inducing properties only when the plaintiff can settle for more than the defendant's apportioned share. If the plaintiff can make take-it-or-leave-it offers, sufficiently high transaction costs will guarantee this result, for then the plaintiff will be able to capture the full surplus produced by the settlement.142 The result also holds even if the plaintiff cannot make take-it-or-leave-it offers, as long as its bargaining power is great enough that it can capture a sufficiently large portion of the surplus.

We turn now to the case in which the plaintiff's probabilities of success against the defendants are perfectly correlated. Recall that under the pro tanto set-off rule, in the absence of litigation costs, the plaintiff settles with the two defendants for $25 and $37.50, respectively, as compared with an expected recovery of $50 from litigating against both.143 In contrast, under the apportioned share set-off rule, if one defendant settles, regardless of the amount, the other defendant's expected loss through litigation is $25.144 Thus, the highest settlement that the plaintiff could extract is $25 from each defendant, for a total recovery of $50.145 The parties are therefore indifferent between settling and litigating.

Moreover, whereas under the pro tanto set-off rule the plaintiff set-

142 See Part II.E.4 supra.
143 See Part II.C supra.
144 See text accompanying notes 138-39 supra.
145 When litigation costs are positive, this lower recovery from settlement under the apportioned share set-off rule will reduce the number of lawsuits, with a consequent savings in litigation costs. One cannot determine whether such a result is desirable without studying its impact on deterrence. See text accompanying notes 21-22 supra.
tles with both defendants not only if the parties have accurate information but also if they are somewhat optimistic, under the apportioned share set-off rule any degree of optimism would frustrate the settlement. Thus, when litigation costs are zero and the plaintiff’s probabilities of success are perfectly correlated, choosing the apportioned share set-off rule over the pro tanto set-off rule deters settlement.

The preceding discussion assumed that the defendants’ shares of the fault are equal. Recall, however, that if these shares are sufficiently different, the pro tanto set-off rule leads to settlement with only one defendant and to litigation with the other.¹⁴⁶ Then, it follows that the apportioned share set-off rule, by making the parties indifferent between settling and litigating, has the effect of encouraging settlement with respect to one defendant and discouraging settlement with respect to the other.

In the case of high litigation costs, for perfectly correlated probabilities of success as for independent probabilities, the plaintiff can extract higher settlements under the apportioned share set-off rule. This is because, in the event that it settles with one defendant and litigates against the other, its recovery is not constrained by its damages. Thus, for sufficiently high litigation costs, choosing the apportioned share set-off rule over the pro tanto set-off rule promotes settlements.

Interestingly, then, regardless of the correlation of probabilities, the pro tanto set-off rule has better settlement-inducing properties than the apportioned share set-off rule for low litigation costs and worse settlement-inducing properties for high litigation costs in cases in which the plaintiff has sufficient bargaining power.

B. The Nature of the Right of Contribution

Before the introduction of comparative fault, contribution shares were determined pro rata. Thus, if the plaintiff prevailed against both defendants, each would pay half the damages regardless of their degrees of fault. The example that we analyzed in detail in Part II,¹⁴⁷ in which contribution was determined by reference to the defendants’ relative shares of the liability, involved two defendants that were each fifty percent at fault. Thus, that example is equivalent to the case of pro rata contribution.

The question, then, is how pro rata contribution compares to contribution determined by reference to comparative fault when the defendants’ shares of the liability are different. We have already identified one situation—perfectly correlated probabilities and low litigation costs

¹⁴⁶ See text accompanying notes 112-13 supra.
¹⁴⁷ See text accompanying notes 96-101 supra.
under the pro tanto set-off rule—in which the plaintiff settles with both defendants only if their shares of the fault are relatively similar. In that case, pro rata contribution has better settlement-inducing properties.\textsuperscript{148}

\section*{C. The Right of Contribution}

Absent a right of contribution between the defendants, they are stuck with the plaintiff's distribution of the damages. If the plaintiff prevails against both defendants, it can collect its full damages from either of them, or it can divide the amount that it seeks from each defendant in whatever way it chooses, subject only to the constraint that it cannot recover more than its damages. To keep the discussion simple, we focus on situations in which the plaintiff collects its full damages from only one defendant.

Say that Row believes that the probability that the plaintiff will collect the judgment from it is $q_R$, and Column believes that this probability is $q_C$. Assume, initially, that both these probabilities are fifty percent. The problem then is exactly analogous to the one discussed in Part II.\textsuperscript{149} If the plaintiff litigates against both defendants and its probabilities of success are independent, each defendant faces an expected loss of $37.50. Row, for example, would have to pay the plaintiff's full damages of $100 if it loses and Column prevails—an outcome that carries a probability of twenty-five percent. If both defendants lose—an outcome that also carries a probability of twenty-five percent—there is a fifty percent probability that the plaintiff would collect its judgment of $100 from Row. Thus, the expected loss of each defendant is not affected by the absence of a right of contribution.\textsuperscript{150}

In the case of perfectly correlated probabilities, if the plaintiff litigates against both defendants, each faces an expected loss of $25: there is a fifty percent probability that both defendants lose, and if they do, each faces a fifty percent probability of having to pay the whole judgment. Here, too, each defendant faces the same expected loss as when a right of contribution exists.\textsuperscript{151}

Thus, for this example at least, the absence of a right of contribution does not affect the choices between settlement and litigation. The equivalence between the two problems, in fact, is even more general. For both problems, if the plaintiff prevails against only one defendant, it collects its full damages from that defendant. If the plaintiff prevails against both defendants under a right of contribution, Row and Column each pay proportions $r$ and $(1-r)$, respectively, of the plaintiff's damages. If the

\textsuperscript{148} A full analysis of this question is beyond the scope of this Article.

\textsuperscript{149} See text accompanying notes 96-101 supra.

\textsuperscript{150} See text accompanying notes 102-03 supra.

\textsuperscript{151} See text accompanying note 107 supra.
plaintiff prevails against both defendants in the absence of a right of contribution, each defendant's proportion of the expected loss is \( q_R \) and \( q_C \), respectively. Clearly, if each defendant's assessment of the probability that the plaintiff will collect the judgment against it in the case of no contribution is equal to its share of the liability—that is, if \( q_R = r \) and \( q_C = (1 - r) \)—then the two problems are identical.

More generally, if \( q_R \) and \( q_C \) sum to one—in which case the defendants are neither pessimistic nor optimistic about their aggregate expected losses in litigation—then the contribution and no contribution problems have the same structure: joint and several liability discourages settlement when the plaintiff's probabilities of success are independent and encourages settlement with at least one defendant when these probabilities are perfectly correlated.\(^{152}\)

Alternatively, if \( q_R \) and \( q_C \) sum to less than one, the defendants are optimistic about their aggregate expected losses and litigation. This optimism has an anti-settlement effect. In contrast, if \( q_R \) and \( q_C \) sum to more than one, the defendants are pessimistic about their aggregate expected losses and litigation. This pessimism has a pro-settlement effect.\(^{153}\)

**D. Joint and Several Liability Versus Non-Joint Liability**

Under non-joint liability, the plaintiff could not recover its full damages of $100 if it prevailed against only one defendant. Instead, it could recover only that defendant's apportioned share of the liability, or $50. Thus, the plaintiff's expected recovery from litigating against both defendants is only $50 (a fifty percent probability of recovering $50 from each of the defendants), regardless of the correlation of the plaintiff's probabilities of success. Each defendant therefore faces an expected loss of $25 (a fifty percent probability of having to pay $50). Under non-joint liability, the plaintiff would simply make offers of $25 to each defendant.

\(^{152}\) In the context of their more limited inquiry, Easterbrook, Landes & Posner, supra note 24, find, like we do, that a rule of no contribution has the same settlement-inducing properties as a rule of contribution, as long as the latter is coupled with contribution protection for settling defendants. See id. at 365. In the conclusion to their article, however, they state, referring to the choice "between contribution and no contribution," that "[a] rule of no contribution creates competition among defendants to settle rather than litigate." See id. at 365. While it is obvious from the context, see id. at 360-63, that the comparison they are making is between a rule of no contribution and a rule of contribution without contribution protection, their claim can be easily misunderstood. For example, one of the briefs in Musick, Peeler & Garrett v. Employers Ins., 113 S. Ct. 2085 (1993), relied on the Easterbrook, Landes & Posner article for the general proposition that "[a] judicially created cause of action for contribution is contrary to public policy because it discourages settlement of litigation." See Brief of Amici Curiae National Association of Securities and Commercial Law Attorneys in Support of Petitioners at 18, Musick, Peeler & Garrett (No. 92-34).

\(^{153}\) The general impacts on settlement of optimism and pessimism are discussed in Part II.E.3 supra.
and they would accept the offers.

We can now compare non-joint liability, and joint and several liability, initially under a pro tanto set-off rule. As before, we start by considering a situation in which litigation costs are zero.

When the plaintiff's probabilities of success are independent, joint and several liability discourages settlements. Whereas non-joint liability induces the plaintiff to settle with both defendants, joint and several liability induces it to litigate against both defendants because joint and several liability gives the plaintiff a surplus that it would lose, at least in part, if it settled.\textsuperscript{154}

In contrast, when the plaintiff's probabilities of success are perfectly correlated, joint and several liability has a less straightforward effect. Consider first the case in which the defendants' relative degrees of fault are sufficiently similar. Under joint and several liability, as under non-joint liability, the plaintiff settles with both defendants. Under joint and several liability, however, the plaintiff's recovery from settling is higher than its expected recovery from litigating,\textsuperscript{155} whereas under non-joint liability the recoveries are identical. Thus, under joint and several liability settlement takes place not only when the parties have accurate information but also when they are optimistic, whereas under non-joint liability optimistic parties will litigate. In this case, joint and several liability promotes settlements.

Second, recall that under joint and several liability, when the defendants' shares of the liability are sufficiently different, the plaintiff settles with the defendant that is responsible for the larger share of the liability, and litigates against the other.\textsuperscript{156} The plaintiff's expected recovery from this outcome is higher than its expected recovery from litigating against both defendants or settling with both defendants. Thus, joint and several liability has the effect of promoting settlements with the defendant responsible for the larger share of the liability and discouraging settlements with the defendant responsible for the smaller share of the liability.

These conclusions assume that litigation costs are zero or sufficiently low. When litigation costs are high, however, the analysis is different for two reasons.

First, one feature of the pro tanto set-off rule, as we have already explained,\textsuperscript{157} is that when the plaintiff settles with one defendant and litigates against the other, it cannot recover more than its full damages.

\textsuperscript{154} See Part II.B supra.
\textsuperscript{155} Recall that if it litigates, the plaintiff's expected recovery from each defendant is $25, but if it settles, it can obtain $25 from one and $37.50 from the other. See Part II.C supra.
\textsuperscript{156} See text accompanying notes 107-12 supra.
\textsuperscript{157} See text accompanying notes 52-53 supra.
Under non-joint liability, in contrast, the plaintiff's recovery is not constrained in this manner.\textsuperscript{158} When the plaintiff makes a take-it-or-leave-it offer and litigation costs are sufficiently high, a defendant under non-joint liability will be willing to pay more than its apportioned share of the liability in order to avoid litigation. For litigation costs in this range, the plaintiff obtains larger settlements under non-joint liability than under joint and several liability coupled with the pro tanto set-off rule.

At the same time, however, when the plaintiff's probabilities of success are independent, its recovery from litigating against both defendants is higher under joint and several liability than under non-joint liability, and is equal under both rules when the probabilities are perfectly correlated. If a defendant were able to make take-it-or-leave-it offers, it would offer the plaintiff the smallest amount that would make the plaintiff indifferent between settling and litigating. The amount thus offered is higher under joint and several liability than under non-joint liability when the plaintiff's probabilities of success are independent, and is equal under both rules when the probabilities are perfectly correlated.

In the real world, none of the parties can make take-it-or-leave-it offers; instead, the parties must engage in bargaining. The case in which the plaintiff makes a take-it-or-leave-it offer defines the upper bound of the settlement range: the plaintiff captures the full surplus of settlement. Similarly, the case in which one of the defendants makes a take-it-or-leave-it offer defines the lower bound of the settlement range: here, the defendant captures the full surplus of settlement. For sufficiently high litigation costs, the settlement range is greater under non-joint liability if the plaintiff has sufficient bargaining power (because, compared to joint and several liability, it recovers more in settlement and less in litigation). For sufficiently high litigation costs, risk-neutral parties with accurate information will settle under both joint and several liability (coupled with a pro tanto set-off rule) and non-joint liability. In contrast, sufficiently optimistic parties will litigate under both rules. The higher settlement range for non-joint liability implies that for an intermediate range of optimism, there will be settlements under non-joint liability but not under joint and several liability.

We now compare the settlement-inducing properties of non-joint liability with those of joint and several liability coupled with an apportioned share set-off rule. Several differences between the set-off rules are significant to this comparison. First, the apportioned share set-off rule, unlike the pro tanto set-off rule, does not constrain the plaintiff's recovery when

it settles with one defendant and litigates with the other. Second, when the plaintiff settles with both defendants, its recovery is equal to its recovery from settling with both defendants under non-joint liability. Indeed, given that one defendant settles, the other will settle as long as the amount of the settlement is no greater than its expected loss through litigation. In the event that it loses the litigation, under the apportioned share set-off rule the defendant must pay the plaintiff’s full damages reduced by the share of the settling party. This amount is identical to its apportioned share of the liability, which is what it would pay under non-joint liability.

With these differences in mind, consider first the case of independent probabilities. For low litigation costs, joint and several liability coupled with an apportioned share set-off rule deters settlements as compared to non-joint liability. Under non-joint liability the parties settle over the whole range of litigation costs, but for sufficiently low litigation costs they do not settle under joint and several liability. For high litigation costs, the settlement range is larger under non-joint liability because the plaintiff’s recovery from litigation is lower; here, too, joint and several liability deters settlements.

Recall that in the case of perfectly correlated probabilities, the plaintiff’s recovery from litigation under joint and several liability is identical to its recovery under non-joint liability. We have shown above that both joint and several liability with an apportioned share set-off rule and non-joint liability produce identical settlements when the plaintiff can make take-it-or-leave-it offers. Thus, for perfectly correlated probabilities, joint and several liability with an apportioned share set-off rule has the same settlement-inducing effects as non-joint liability.

E. Contribution Protection for Settling Defendants

The rule modeled in Part II granted settling defendants protection from contribution actions brought either by non-settling defendants or by other settling defendants. Here, we consider the effect of allowing non-settling defendants to bring contribution actions against settling defendants.

Exposing settling defendants to contribution actions has the unambiguous effect of discouraging settlements. Consider the example in

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159 See text accompanying notes 53-55 supra.
160 See text accompanying note 107 supra.
161 See text accompanying note 159 supra.
162 As indicated above, to allow settling defendants to bring contribution actions against each other requires not only eliminating the rule of contribution protection for settling defendants but also granting settling defendants the right of contribution. See text accompanying notes 60-61 supra.
which the plaintiff makes offers of $37.50 to each defendant when litigation costs are zero and the plaintiff's probabilities of success are independent. Recall that under a rule of contribution protection, if one defendant, say Row, accepts the settlement, it confers a benefit of $6.25 on Column, reducing Column's expected loss, in the event that both defendants litigate, from $37.50 to $31.25 (a fifty percent probability of recovering $100 minus $37.50), and that, as a result of this externality, settlement does not occur.\footnote{163}

Removing contribution protection increases the magnitude of this externality. Indeed, the plaintiff has a fifty percent probability of recovering $62.50 from Column ($100 minus Row's settlement of $37.50). Column's expected loss to the plaintiff is therefore $31.25. If the plaintiff prevails (a probability of fifty percent), Column, in turn, has a fifty percent probability of recovering from Row the $12.50 representing the excess that Column paid above its apportioned share of the liability, which is $50. The probability that Column will recover this $12.50 is twenty-five percent: for recovery to occur, the plaintiff must prevail against Column and Column must prevail against Row. Column's expected recovery in the contribution action is thus $3.12 (twenty-five percent of $12.50), and its expected loss if it chooses to litigate in light of Row's settlement of $37.50 is $28.13 (its expected loss of $31.25 under a rule of contribution protection minus its expected recovery of $3.12 in the contribution action).\footnote{164} Thus, removing contribution protection increased the size of the externality by $3.12.

F. Contribution Rights for Settling Defendants

In Part II, we modeled a rule in which settling defendants were denied contribution rights but granted contribution protection. Maintaining the regime of contribution protection but granting settling defendants contribution rights promotes settlements. This change in the legal regime, however, has an effect only when the settlement is for more than the defendant's apportioned share of the liability, because otherwise the defendant would not be entitled to exercise its right.

If one defendant chooses to litigate, there will be situations in which the other defendant, say Row, would be willing to pay a higher settlement when settling defendants have the right to bring contribution actions. This result occurs in cases in which the costs of litigation are sufficiently high, and in which the plaintiff has sufficient bargaining power, that the settling defendant pays more than its apportioned share of the liability. Thus, Row will accept certain offers by the plaintiff that

\footnote{163}{See Part II.B supra.}
\footnote{164}{See text accompanying notes 103-04 supra.}
it would have rejected absent a right of contribution for settling defendants. In turn, given that Row settles, Column is more likely to settle as well when doing so shields it, as a result of the rule of contribution protection for settling defendants, from a contribution action that Row could otherwise bring.

G. “Good Faith” Hearings

In Part II, we analyzed a legal regime in which the amounts of the plaintiff’s settlement offers were not scrutinized by the courts. Expanding the nature of a “good faith” hearing beyond a procedural determination of lack of collusion to include substantive judicial scrutiny of the amount of the settlement has the simple effect of discouraging settlements.

Consider a case in which the plaintiff’s probabilities of success are independent. Recall that, for sufficiently low litigation costs, no settlement with both defendants is as attractive to the plaintiff as litigation against both. It follows a fortiori that settlement would be comparatively less attractive if the plaintiff were constrained by the courts from making certain settlement offers.

Next, consider cases in which the plaintiff chooses to settle with both defendants in a legal regime under which the good faith hearing is solely procedural. If this hearing also had a substantive component, it might invalidate the settlement offers that maximized the plaintiff’s recovery. As a result, the settlement offers permitted under an expanded good faith hearing might be less desirable than litigating against either one or both defendants.

Thus, adding a substantive component to the good faith hearing makes the pro tanto set-off rule relatively less desirable from the perspective of inducing settlements than the apportioned share set-off rule: there will be some cases in which the former has better settlement-inducing properties when the good faith hearing is solely procedural, but worse properties when this hearing also has a substantive component. For similar reasons, an expanded good faith hearing makes joint and several liability coupled with a pro tanto set-off rule relatively less desirable than non-joint liability.

This undesirable result is magnified when the costs of litigation are not zero. One of the advantages of settlement is that it saves litigation costs, creating a surplus for the parties to divide. To the extent that this surplus is reduced as a result of the litigation costs expended in the good faith hearing, the incentives for settlement are diminished.

H. Joinder Rules

In Part II, the plaintiff either sued both defendants in a single ac-
tion, or, if it sued only one, that defendant impleaded the other. We consider here a situation in which the plaintiff initially sues only one defendant and impleader is not allowed, so that the adjudication of the right of contribution must await a separate proceeding.

Consider, first, the case in which the plaintiff's probabilities of success are independent. If the plaintiff sues only one defendant, say Row, and prevails, it collects its full damages from that defendant. In turn, Row can file a contribution action against Column. In order to recover, it will have to show that Column was liable to the plaintiff. Because the plaintiff's probabilities of success would have been independent if it had sued both defendants, the plaintiff's probability of prevailing in the first action and Row's probability of prevailing in the contribution action are also independent.

In this case (independent probabilities), if the plaintiff loses to Row, the rules of collateral estoppel do not preclude it from bringing a subsequent action against Column. Consider, for example, the case where the plaintiff is a pedestrian who was hit by two cars that jumped onto the sidewalk, and the issue is whether each of the drivers was negligent. The fact that the plaintiff was unable to show Row's negligence in no way precludes it from attempting to show that Column was negligent.

Moreover, if the plaintiff prevails against Column after having lost to Row, Column can bring a contribution action against Row. In order to prevail in that action, Column would have to show that Row was liable to the plaintiff. While this issue was decided in favor of Row in the first proceeding, the current rules on collateral estoppel permit Column to relitigate it because it was not a party to that proceeding. This feature creates a difference between joinder and non-joinder. Whereas under the former a losing defendant cannot obtain contribution from a co-defendant that prevailed against the plaintiff, under the latter such contribution is possible.

Turn now to the example developed in Part II. If the plaintiff litigates first against Row, and, in the event that it loses, then litigates against Column, its expected recovery, as in the case in which it litigates against both defendants together, is $75. Indeed, with a probability of fifty percent, it recovers $100 from Row, and with a probability of twenty-five percent (if it loses against Row and then prevails against Column), it recovers $100 from Column.

166 See Restatement (Second) of Judgments § 27 (1982).
167 See id. § 29.
168 See text accompanying notes 96-101 supra.
The allocation of this burden between the defendants is different than in the case in which the actions are joined, where each defendant faces an expected loss of $37.50. In the absence of joinder, Row’s expected loss from litigating against Column has the following components. First, with a probability of fifty percent, Row loses and must pay the plaintiff $100 (an expected loss of $50); in this event, however, its expected recovery from Column in a contribution action is $12.50 (with a probability of fifty percent, the plaintiff prevails against Row; in that event, with a probability of fifty percent, Row prevails against Column in the contribution action and recovers Column’s share of $50). Second, with a probability of fifty percent, Row prevails against the plaintiff but may be subject to a contribution action from Column. Its expected loss from this action is $6.25 (with a probability of fifty percent, the plaintiff loses to Row; in that event, with a probability of fifty percent, the plaintiff prevails against Column; in that event, with a probability of fifty percent Column prevails in the contribution action and recovers Row’s share of $50). Thus, Row’s expected loss is not $37.50, as it is under joinder, but $43.75 ($37.50 plus $6.25). Since, as we noted in the prior paragraph, the plaintiff’s expected recovery is not affected by the lack of joinder, it follows that Column’s expected loss is $31.25 ($37.50 minus $6.25).

Row would be willing to settle for an amount equal to its expected loss in litigation—$43.75. But if Row settles for this amount, Column faces an expected loss of $28.12 under the pro tanto set-off rule (a fifty percent probability of losing $100 minus Row’s settlement of $43.75) and $25 under the apportioned share set-off rule (a fifty percent probability of losing $100 minus Row’s apportioned share of $50). As a result of the benefit conferred on Column by Row’s settlement, the plaintiff’s maximum recovery from settling with both defendants is less than its expected recovery from litigating against both defendants.169

Now, turn to the case in which the plaintiff’s probabilities of success are perfectly correlated. If the plaintiff sues only one defendant, say Row, and prevails, it collects its full damages from that defendant. In turn, Row can file a contribution action against Column. Because Column was not a party to the initial litigation, Row cannot prevail simply on the basis of collateral estoppel.170

Moreover, even though the plaintiff would have prevailed against both defendants if it had sued them both together, it does not follow that because the plaintiff prevailed against Row in the first action, Row will necessarily prevail in its contribution action against Column. For exam-

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169 The full comparison of the impact of joinder and non-joinder rules is beyond the scope of this Article.

170 See Restatement (Second) of Judgments § 29.
ple, assume that the litigation is whether Row and Column conspired against the plaintiff. Because a single party cannot conspire with itself, in a single proceeding against the two defendants, the plaintiff would have either prevailed against both or lost against both. Row's contribution action against Column, however, takes place at a different time, before a different trier of fact, and with different parties. Therefore, it may well come out differently.

In contrast, in this case (perfectly correlated probabilities), if the plaintiff loses against Row, the rules of non-mutual collateral estoppel preclude it from bringing a subsequent action against Column. If the plaintiff was unable to convince one court that Row conspired with Column, it cannot attempt to convince another court that Column conspired with Row.\(^{171}\) In turn, if the plaintiff cannot bring an action against Column after it has lost against Row, Column will have no occasion to bring a contribution action. Thus, in the case of perfectly correlated probabilities, there is no scenario under which Row could prevail against the plaintiff but still face contribution from Column.

Returning to the example developed in Part II, the plaintiff's expected recovery in litigation when its probabilities of success are perfectly correlated is $50, regardless of whether it sues one defendant or both. Under the pro tanto set-off rule, recall that when the plaintiff sues both defendants offers of $33.33 to each can produce either an equilibrium solution in which they both settle or an equilibrium solution in which they both litigate, and that, to be assured a settlement, the plaintiff instead makes offers of $37.50 and $25.\(^{172}\)

What happens if the plaintiff sues Row and then offers it a settlement of $33.33? If Row rejects the settlement, it faces an expected loss in its litigation against the plaintiff of $50 (a fifty percent probability of losing $100). If it was assured victory in its contribution action, its expected recovery from Column would be $25: in the event that Row loses to the plaintiff (a fifty percent probability), it would recover $50 from Column. Thus, Row's aggregate expected loss if it litigates against the plaintiff is only $25, and Row would reject any larger settlement.\(^{173}\) If Row settles for $25, the plaintiff's expected recovery from Column is $37.50 (a fifty percent probability of recovering $75), the amount it could obtain in settlement. Thus, the lack of joinder does not change the outcome: the

\(^{171}\) Non-mutual collateral estoppel applies to this situation. See Parklane Hosiery Co. v. Shore, 439 U.S. 322, 326-33 (1979); Blonder-Tongue Labs. v. University of Ill. Found., 402 U.S. 313, 328-50 (1971); Restatement (Second) of Judgments § 29.

\(^{172}\) See text accompanying notes 109-13 supra.

\(^{173}\) Unless Row settled for more than $50, it could not maintain a contribution even if the legal regime allowed settling defendants to bring such actions, because it would not have paid more than its apportioned share of the liability.
plaintiff still settles with one defendant for $25 and with the other for $37.50.

Finally, under the apportioned share set-off rule, recall that when the plaintiff sues both defendants, it settles for $25 with each. In the case of non-joined defendants, Row, once again, would be willing to settle for $25—its expected loss in litigation. The plaintiff’s expected recovery from Column is then $25 (a fifty percent probability of recovering $50), the amount it could obtain in settlement. As under the pro tanto set-off rule, the lack of joinder does not change the outcome.

The preceding analysis shows that none of our major qualitative results are driven by the joinder of the actions. We have identified, however, two ways in which the lack of joinder might make a difference: when the plaintiff’s probabilities of success are independent, a defendant that prevails against the plaintiff might nonetheless be subjected to a contribution action; and when the plaintiff’s probabilities of success are perfectly correlated, the fact that the plaintiff prevails against one defendant does not imply that this defendant will prevail in the contribution action.

In addition, the litigation costs expended by the parties might depend on whether the actions are joined. For example, there may be economies of scale in litigation, so that it may be cheaper for the plaintiff to litigate against both defendants in a single action than to litigate against them separately. To the extent that the settlement-inducing properties of the different legal rules depend on the levels of litigation costs, joinder would have an effect on whether cases are settled or litigated. A full exploration of this question is beyond the scope of this Article.

I. Summary of the Major Results

The preceding discussion establishes three major results. First, we showed that as between the pro tanto set-off rule and the apportioned share set-off rule, the former is generally more likely to induce settlements for low litigation costs and less likely to do so for high litigation costs. The one exception concerns the case in which the plaintiff’s probabilities of success are perfectly correlated and the defendants’ shares of the liability are sufficiently different. In that case, while the pro tanto set-off rule encourages settlements with one of the defendants, it discourages settlements with the other.

Second, we showed that a regime of contribution has the identical effects on the choice between settlement and litigation as one of no contribution. This result is independent of the set-off rule, the level of litiga-

174 See text accompanying notes 144-45 supra.
175 See note 140 supra.
176 The latter result holds only if the plaintiff’s bargaining power is sufficiently great. See text accompanying notes 140-42 supra.
tion costs, and the correlation of the plaintiff’s probabilities of success.

The third set of results, which concerns the choice between joint and several liability and non-joint liability, is somewhat less straightforward. These results are summarized in Tables I and II. When the plaintiff’s probabilities of success are independent, joint and several liability always discourages settlement. In contrast, when the plaintiff’s probabilities of success are perfectly correlated, joint and several liability has no effect on the choice of settlement and litigation when it is coupled with the apportioned share set-off rule. Under the pro tanto set-off rule, joint and several liability discourages settlements for sufficiently high litigation costs; for sufficiently low litigation costs, joint and several liability encourages settlements with both defendants when their shares of the liability are sufficiently similar, and it encourages settlements with one defendant and discourages settlements with the other when these shares are sufficiently different.

### Table I

**Effects of Joint and Several Liability on Settlement When the Plaintiff’s Probabilities of Success Are Independent**

<table>
<thead>
<tr>
<th></th>
<th>Low Litigation Costs</th>
<th>High Litigation Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pro Tanto Set-Off</td>
<td>Discourages settlement</td>
<td>Discourages settlement</td>
</tr>
<tr>
<td>Apportioned Share Set-Off</td>
<td>Discourages settlement</td>
<td>Discourages settlement</td>
</tr>
</tbody>
</table>

### Table II

**Effects of Joint and Several Liability on Settlement When the Plaintiff’s Probabilities of Success Are Perfectly Correlated**

<table>
<thead>
<tr>
<th></th>
<th>Low Litigation Costs</th>
<th>High Litigation Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pro Tanto Set-Off</td>
<td>Encourages settlement with at least one defendant</td>
<td>Discourages settlement</td>
</tr>
<tr>
<td>Apportioned Share Set-Off</td>
<td>No effect</td>
<td>No effect</td>
</tr>
</tbody>
</table>

### IV

**The Judicial Choice Between Set-Off Rules**

The courts are deeply divided over the choice between set-off rules. The courts typically justify their choice between the pro tanto and appor-
tioned share set-off rules at least in part on the basis of their assessments of the relative settlement-inducing properties of these competing rules. We show that practically all of the judicial decisions stem from basic conceptual misunderstandings of the dynamics of the settlement process. Section A examines judicial arguments in favor of the settlement-inducing properties of the pro tanto set-off rule. Section B analyzes decisions maintaining that the apportioned share set-off rule encourages more settlements. Section C looks at cases preferring the apportioned share set-off rule on the ground that the pro tanto set-off rule induces undesirable settlements.

A. Decisions Maintaining That the Pro Tanto Set-Off Rule Encourages More Settlements

Courts maintaining that the pro tanto set-off rule is better from the perspective of inducing settlement advance essentially three distinct arguments for this proposition: (1) that the plaintiff does not bear the risk of a low settlement, (2) that a non-settling defendant bears the risk of a larger share of the liability, and (3) that the level of uncertainty is reduced.

I. The Plaintiff Does Not Bear the Risk of a Low Settlement

Some courts argue that the pro tanto set-off rule encourages settlement because the plaintiff does not bear the risk of a low settlement with one defendant since it can recover the shortfall through litigation against the other defendants. It is true, as we have explained above, that a plaintiff that settles with one defendant for less than that defendant's apportioned share and then prevails in litigation against the other defendant can recover its full damages under the pro tanto set-off rule but not under the apportioned share set-off rule.

The courts, however, overlook the fact that even under the pro tanto set-off rule, if the plaintiff settles with one defendant for an amount that is too low, it compromises its expected recovery. The reason is that if the

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178 Some courts merely refer to the better settlement-inducing properties of the pro tanto set-off rule without explaining their reasoning. See, e.g., Sears v. Atchison, Topeka & Santa Fe Ry., 749 F.2d 1451, 1454-55 (10th Cir. 1984); American Motorcycle Ass'n v. Superior Court, 578 P.2d 899, 915-16 (Cal. 1978).


180 See text accompanying notes 52-53 supra.
plaintiff loses the subsequent litigation, its only recovery will have come from the settling defendant.\textsuperscript{181}

Moreover, in the case of independent probabilities of success, a low settlement poses an additional risk to the plaintiff. Settlement with one defendant deprives the plaintiff of the “insurance” that results from its ability to recover its full damages when it litigates against two defendants even if it prevails only against one. So, if the plaintiff settles with one defendant, say Row, and litigates and loses against Column, the settlement with Row deprives it of the possibility of having litigated against Row and won. This “insurance,” however, is unavailable when the probabilities of success are perfectly correlated, because then the plaintiff’s loss against Column implies that if Row had not settled, the plaintiff would have lost against Row as well.

In addition, under the apportioned share set-off rule, unlike under the pro tanto set-off rule, the plaintiff is not precluded from recovering more than its damages if it settles with one defendant and litigates against the other: this result will ensue whenever the settlement is for more than the defendant’s apportioned share of the liability.\textsuperscript{182} Thus, while the courts focus on one of the effects of the pro tanto set-off rule in cases in which the plaintiff settles with one defendant and litigates against the other—that it leads to a higher total recovery when the settlement is low—they overlook the mirror image of that effect—that it leads to a lower total recovery when the settlement is high.

Also, the fact that under one set-off rule the plaintiff might be willing to accept a lower settlement does not, by itself, make settlement more likely. The question one must ask, but which the courts do not, is whether the defendant contemplating settlement would be willing to pay as much under that rule. If the set-off rule also resulted in lower offers on the part of such a defendant, it would not follow that the plaintiff’s willingness to accept a lower settlement would make settlement more likely.\textsuperscript{183} We now proceed to show, moreover, that even this inquiry would not take us very far.

Fundamentally, the courts overlook the strategic nature of the problem. Even if the plaintiff’s settlement with one defendant under the pro tanto set-off rule would not compromise its recovery against the other, it does not follow that the pro tanto set-off rule would encourage settlements. The plaintiff will settle with one defendant, say Row, and litigate against the other, rather than litigating against both, only if the following

\textsuperscript{181} If the plaintiff wins, but the losing defendant is insolvent, or the costs of collecting from this defendant are high, the plaintiff’s recovery will also be compromised.

\textsuperscript{182} See text accompanying notes 53-55 supra.

conditions are met. First, the plaintiff’s expected recovery from settling with one defendant and litigating against the other must be greater than its expected recovery from litigating against both defendants. Second, given that Column litigates, Row must prefer to settle rather than litigate. Third, given that Row settles, Column must prefer to litigate rather than settle.

One must then determine the effects of the two set-off rules on each of these conditions. The plaintiff’s expected recovery in the event that it litigates against both defendants is unaffected by the choice of set-off rule: in the absence of litigation costs, it depends only upon its probabilities of success against the defendants, the correlation of these probabilities, and its damages. In contrast, the plaintiff’s expected recovery from Column in the event that it settles with Row and litigates against Column is affected by the choice of set-off rule: for a given settlement with Row, the plaintiff’s expected recovery under the pro tanto set-off rule is higher if the settlement is for less than Row’s apportioned share of the liability, and lower if the settlement is for more than Row’s apportioned share of the liability. Thus, settling with one defendant appears relatively more attractive to the plaintiff (compared with litigating against both) under the pro tanto set-off rule when the settlement with Row is for less than Row’s apportioned share of the liability, and relatively less attractive when this settlement is for more than Row’s apportioned share of the liability. Because the plaintiff is potentially able to extract higher settlements from Row when litigation costs are high, the plaintiff’s relative recoveries under the two scenarios depend upon the level of litigation costs.

With respect to the second condition, given that Column litigates, the highest amount that Row would be willing to pay in settlement is unaffected by the choice of set-off rule: in the absence of litigation costs, it is simply the expected value of litigating given that Column also litigates—a value which depends upon Row’s share of the liability, as well as upon the plaintiff’s probabilities of success against the defendants, the correlation of these probabilities, and its damages.

With respect to the third condition, given that Row settles, the smallest settlement offer that would induce Column to litigate rather than settle is affected by the set-off rule. If Row settles for less than its apportioned share of the liability, as it would when litigation costs are low, Column’s expected loss through litigation (and thus the smallest

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184 See note 185 infra.

185 For example, under the pro tanto set-off rule, for perfectly correlated probabilities, when litigation costs are zero the defendants settle for $37.50 and $25, respectively. See text accompanying notes 107-12 supra. The apportioned share of each defendant’s liability is $50. The reason that the settlement is lower than the apportioned share of the liability is that the settle-
settlement that would induce it to litigate rather than settle) is higher under the pro tanto set-off rule. The opposite is true when Row's settlement is for more than its apportioned share.

So far, the discussion of the strategic nature of the problem focused only on the plaintiff's choice of litigation against both defendants as opposed to settlement with one defendant and litigation against the other—the choice that was the implicit focus of the courts. The full analysis of the problem also requires us to consider the effects of the set-off rules on the conditions necessary for settlement with both defendants. First, the plaintiff's expected recovery from settling with both defendants must be greater than its expected recovery from litigating against both defendants or from settling with one and litigating against the other. Second, given that Column settles, Row must prefer to settle rather than litigate. Third, given that Row settles, Column must prefer to settle rather than litigate. As the preceding discussion should make clear, the first condition is unaffected by the choice of the set-off rule, but the second and third conditions are affected by this choice. Given that Row settles, the highest settlement that Column would pay rather than litigate, which is equal to its expected loss through litigation, is higher under the pro tanto set-off rule if Row settled for less than its apportioned share of the liability. If, in contrast, Row settled for more than its apportioned share of the liability, the highest settlement that Column would pay rather than litigate is lower under the pro tanto set-off rule. This discussion shows that, from the perspective of inducing settlements with both defendants, the relative desirability of the set-off rules depends on the level of litigation costs.

2. A Non-Settling Defendant Bears the Risk of a Larger Share of the Liability

A second argument advanced by courts in favor of the settlement-inducing properties of the pro tanto set-off rule is that this rule encourages settlements because a non-settling defendant bears the risk that by not settling it will end up paying more than its apportioned share of the liability. These courts focus implicitly on whether, given that one de-

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186 The fact that, for a particular set of offers, Column might choose to settle in light of Row's settlements does not guarantee that those offers would in fact lead to settlement with both defendants. It may be that, given that Column settles, Row would prefer to litigate.

fendant settles, the other would settle as well. They maintain that, in light of a plaintiff’s settlement with one defendant, not settling would be relatively more costly to the other defendant under the pro tanto set-off rule, and that this higher cost would create incentives for the defendant to settle.

This argument stems from the same conceptual misunderstandings as the prior one. The pro tanto set-off rule leaves a non-settling defendant worse off only if the plaintiff’s settlement with the other defendant is for less than that defendant’s apportioned share of the liability. Moreover, the question is not simply whether litigation would be relatively more expensive for one defendant. One must also ask how the choice of set-off rule affects the amount that the plaintiff demands in settlement—a question that one cannot answer without considering, as we did in criticizing the previous argument, the full strategic nature of the problem.

3. The Level of Uncertainty Is Reduced

Some courts state that the pro tanto set-off rule promotes settlements by reducing the level of uncertainty faced by litigating parties. Under both rules, the litigating parties face uncertainty about the level of damages that will be assessed by the finder of fact. Under the apportioned share set-off rule, however, the plaintiff faces the additional uncertainty about the degree of fault that will be attributed to the settling defendant. Indeed, whereas under the pro tanto set-off rule, when the plaintiff settles with one defendant and litigates against the other, its recovery if it prevails is reduced by the amount of the settlement regardless of the settling defendant’s share of the liability, under the apportioned share set-off rule, its recovery is reduced by that share.

Thus, following the plaintiff’s settlement with one defendant, the pro tanto set-off rule does, in fact, reduce the uncertainty faced by the plaintiff and the non-settling defendant. But there is no reason to equate less uncertainty with a higher probability of settlements. If, under the apportioned share set-off rule, the parties have the same estimate of the settling defendant’s share of the liability, the fact that they are not certain that their estimate is correct does not affect the probability of settlement as long as the parties are risk neutral. If, in contrast, they are risk averse, less uncertainty leads to a lower probability of settlement.

Alternatively, the uncertainty over the settling defendant’s share of


189 See TBG, 811 F. Supp. at 604; Western Processing, 756 F. Supp. at 1431.
the liability could result in different estimates of this share on the part of the plaintiff and the non-settling defendant. In this situation there are two relevant scenarios: the plaintiff and the non-settling defendant could be either optimistic or pessimistic. They are optimistic if the plaintiff’s assessment of the settling defendant’s share is lower than the estimate of the non-settling defendant; then, under the apportioned share set-off rule, the plaintiff would expect to recover more than the non-settling defendant would expect to pay. In contrast, the parties are pessimistic if the plaintiff’s assessment of the settling defendant’s share is higher than the estimate of the non-settling defendant; then, under the apportioned share set-off rule, the plaintiff would expect to recover more than the non-settling defendant would expect to pay.

As we indicated above, pessimism encourages settlement, whereas optimism discourages settlement. Thus, if the parties are pessimistic, the pro tanto set-off rule discourages settlement relative to the apportioned share set-off rule: by eliminating one source of the uncertainty over the plaintiff’s recovery, it makes settlement less likely. In contrast, if the parties are optimistic, the pro tanto set-off rule encourages settlement relative to the apportioned share set-off rule.

B. Decisions Maintaining That the Apportioned Share Set-Off Rule Induces More Settlements

Courts that claim that the apportioned share set-off rule induces more settlements advance two different arguments: that a non-settling defendant may gamble on a verdict rather than settle, and that the need for a “good faith” hearing under the pro tanto set-off rule discourages settlements.

1. A Non-Settling Defendant May Gamble on a Verdict

Some courts claim that the pro tanto set-off rule “may act as an impediment to total settlement as a nonsettling defendant may count on the guaranteed credit and then gamble on the verdict rather than settle.” In contrast, the argument goes, under the apportioned share set-off rule, “total settlement is encouraged after partial settlement as a culpable nonsettlor cannot escape responsibility when a settling defendant pays more than his fair share and cannot gamble on a jury verdict in view of a guaranteed credit.”

The reasoning of these courts is far from clear. They could be focusing on the relative sizes of the plaintiff’s credit under the two set-off

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190 See Part II.E.3 supra.
191 Western Processing, 756 F. Supp. at 1430.
192 Id. at 1431.
rules. In that case, they overlook that, under either set-off rule, a non-settling defendant gets a credit when the plaintiff settles with the other defendant: this credit is larger under the apportioned share set-off rule when the settling defendant pays less than its apportioned share, but if the settling defendant pays more than its apportioned share, the pro tanto set-off rule produces the larger credit. In the event of a settlement with one defendant, the size of the credit ought to have no effect on the likelihood of settlement. The plaintiff would demand more, and the non-settling defendant would be willing to pay more, if the credit is smaller. Of course, this argument does not answer the question of which rule would induce one of the defendants to settle in the first place—an inquiry that cannot be undertaken without considering the strategic relationships among the parties.193

Alternatively, the courts could be focusing on the “guaranteed” nature of the credit under the pro tanto set-off rule, which is known as soon as the plaintiff settles with one defendant. In contrast, under the apportioned share set-off rule, the credit is not determined until the trial with the non-settling defendant. The argument that the guaranteed nature of the credit under the pro tanto set-off rule makes settlement less likely is equivalent to the argument that the pro tanto set-off discourages settlement because it eliminates one source of uncertainty from the plaintiff’s case against the non-settling defendant—an argument which, as we explained above, holds only in the case of pessimistic parties.194

2. Litigation Costs Associated with a “Good Faith” Hearing Under the Pro Tanto Set-Off Rule

Some courts complain that the pro tanto set-off rule requires a cumbersome “good faith” hearing to determine the adequacy of the settlement.195 By making settlement relatively more costly, the need for this hearing removes some of the incentives to settle.196 This argument rests on an implicit empirical claim that is difficult to test. It is true that, in instances in which the plaintiff settles with one defendant and litigates against the other, the pro tanto set-off rule requires some sort of “good faith” hearing to determine the adequacy of the settlement. In contrast, however, the apportioned share set-off rule requires that, if the plaintiff

193 See text accompanying notes 182-87 supra.
194 See Part IV.A.3 supra.
196 See Donovan, 752 F.2d at 1181 (“The fairness hearing makes the settlement process more costly; and as the costs of settlement rise closer to those of trial, the likelihood of settlement falls—maybe far enough to offset the incentive that a defendant has who knows that settling will enable him to avoid all liability to the other tortfeasors.”).
prevails against the non-settling defendant, the courts determine, retrospectively, the apportioned share of the settling defendant. Thus, each of the set-off rules requires a judicial inquiry that the other does not.\textsuperscript{197} Unless the inquiry required by one of the rules is systematically more cumbersome, no general claim about the relative desirability of the rules can be made on this basis.

Even if the costs associated with the good faith hearing under the pro tanto set-off rule were higher, it would not necessarily follow that this set-off rule would discourage settlement. To the extent that such a hearing imposes high costs on the non-settling defendant, which must attempt to persuade the court to set aside the settlement, it makes settlement appear relatively more attractive to that defendant.

\textbf{C. Decisions Maintaining That the Pro Tanto Set-Off Rule Induces Undesirable Settlements}

Other courts focus on the relative desirability of the settlements under the two set-off rules and maintain that the apportioned share set-off rule performs better.\textsuperscript{198} They claim that the pro tanto set-off rule promotes collusive settlements, that it permits guiltier parties to settle early for less than their equitable share of the liability, that it forces wealthy defendants to bear a disproportionate share of the liability, and that it unfairly penalizes a non-settling defendant.

\textbf{I. The Pro Tanto Set-Off Rule Promotes Collusive Settlements}

Some courts claim the pro tanto set-off rule promotes collusive settlements: "By accepting a low partial settlement, plaintiffs would be able to fund further litigation with no diminution of the total amount eventually received."\textsuperscript{199} As explained above, these courts overlook the fact that this strategy would compromise the plaintiff's expected recovery: there is no diminution in the amount received only if the plaintiff prevails in the subsequent litigation.\textsuperscript{200}


\textsuperscript{198} One court has gone so far as to argue that "the only settlements that the pro tanto set-off rule promotes, beyond those promoted by [an apportioned share set-off rule], are bad ones." MFS Mun. Income Trust v. American Medical Int'l, Inc., 751 F. Supp. 279, 284 (D. Mass. 1990) (citing In re Sunrise Sec. Litig., 698 F. Supp. 1256, 1259 n.5 (E.D. Pa. 1988)).

\textsuperscript{199} Franklin v. Kaypro Corp., 884 F.2d 1222, 1230 (9th Cir. 1989), cert. denied, 498 U.S. 890 (1990); see also In re Masters Mates & Pilots Pension Plan & IRAP Litig., 957 F.2d 1020, 1029 (2d Cir. 1992); Dobson v. Camden, 705 F.2d 759, 768 (5th Cir. 1983), rev'd on other grounds, 725 F.2d 1003 (5th Cir. 1984).

\textsuperscript{200} See text accompanying notes 179-82 supra.
2. **Under the Pro Tanto Set-Off Rule, Guiltier Parties Would Settle Early for Less Than Their Equitable Share of the Liability**

Courts have suggested that the pro tanto set-off rule "would allow guiltier defendants to get off cheaply by settling first."201 This argument stems from the same misconception as stated previously. In the event that the plaintiff settles with one defendant and litigates against the other, if it fails to maximize its recovery in settlement, it will compromise its expected recovery because it is not guaranteed success in the litigation. The plaintiff faces this penalty regardless of whether the settlement is with the guiltier or less guilty defendant.202

3. **The Pro Tanto Set-Off Rule Forces Wealthy Defendants to Bear a Disproportionate Share of the Liability**

Some courts claim that the pro tanto set-off rule is undesirable because "plaintiffs could effect low settlements with defendants who had limited resources, and thereby force wealthier defendants to pay more than if all parties proceeded to trial."203 In contrast, under the apportioned share set-off rule, the plaintiff would bear the whole shortfall if it settled for a small amount with a defendant that had limited solvency.

The courts, however, fail to consider what would happen if such a settlement did not take place. If the plaintiff litigated against both defendants and prevailed against both at trial, the wealthier defendant would have to make up for the shortfall under either set-off rule if the share of the defendant with limited resources was greater than its solvency.

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201 See Donovan v. Robbins, 752 F.2d 1170, 1181 (7th Cir. 1984) (Posner, J.); see also Sunrise Sec. Litig., 698 F. Supp. at 1259 (citing Donovan, 752 F.2d at 1181).


203 Kaypro, 884 F.2d at 1230; see also United States Fidelity & Guar. Co. v. Patriot's Point Dev. Auth., 772 F. Supp. 1565, 1575 (D.S.C. 1991) (stating pro tanto set-off rule "allows plaintiffs to target deep-pocket defendants, and fund ... litigation through 'war chests' created by settlements with more culpable parties purportedly unable to pay their fair share of damages"); cf. Dobson, 705 F.2d at 768 ("Certainly, nothing prevents a collusive, low settlement with a less solvent tortfeasor, who might even be largely responsible for the harm, in exchange for that tortfeasor's assistance in prosecuting a claim against the less responsible, more solvent joint tortfeasors."). For further discussion, see text accompanying notes 125-26 supra.

The *Kaypro* court also adds that the apportioned share set-off rule promotes settlements. See *Kaypro*, 884 F.2d at 1231. The only justification it gives for this pronouncement is that “[f] Defendants that are inclined to settle may do so without penalty or risk.” Id. The court seems to be comparing the apportioned share set-off rule to the pro tanto set-off rule without contribution protection for settling defendants. With contribution protection, settling defendants under the pro tanto set-off rule are protected against further liability in the same manner as settling defendants under the apportioned share set-off rule.
It is true that in this case, the defendant with limited solvency would pay its full solvency to satisfy the judgment, whereas in the event of a settlement it would pay a lower amount, reflecting the probability that it would prevail at trial. At the same time, however, litigating the case would consume some, perhaps even all, of that defendant’s assets, so it is possible that the amount remaining, if any, to satisfy the judgment would be lower than what the defendant would have been willing to pay in settlement. In this scenario, by discouraging the plaintiff from settling with the defendant that has limited solvency, the apportioned share set-off rule produces a less equitable share of the burdens.

4. The Pro Tanto Set-Off Rule Unfairly Penalizes a Non-Settling Defendant

Courts also maintain that the pro tanto set-off rule unfairly penalizes the non-settling defendant. The argument is that as a result of the saving of litigation costs that comes from settlement, a plaintiff will be willing to settle for a lesser amount than what it might recover through litigation, leaving the other defendant responsible for a larger proportion of the plaintiff’s damages. This problem, the courts maintain, is not corrected by a “good faith” hearing because courts allow this type of discounting in determining whether the settlement was appropriate.

These courts fail to consider two relevant elements of this problem. While the plaintiff saves litigation costs by settling with one defendant, it does not necessarily follow that the settling defendant would get the benefit from this saving in the form of a lower settlement. In fact, it is equally likely that high litigation costs would increase the amount of the settlement because of the resulting saving to the settling defendant.

Consider this issue in the context of a single-defendant problem in which the plaintiff has a probability of fifty percent of recovering damages of $100. In the absence of litigation costs, risk-neutral parties with accurate information would settle for $50. If litigation costs are $10, the range of settlement is between $40 and $60. If the plaintiff’s bargaining power is greater, the settlement is likely to be for more than $50; if the defendant’s bargaining is greater, it is likely to be for less than $50. It is the relative bargaining power of the parties, rather than the amount of the litigation costs, that determines whether the settlement is for more than the plaintiff’s expected recovery through litigation.

204 See Kaypro, 884 F.2d at 1230.
205 See id.
206 As one court perceptively noted, “both the plaintiff and the settlor save litigation expenses by settling. Consequently, the litigation savings provide a range on either side of that figure in which the parties may compromise.” MFS Mun. Income Trust v. American Medical Int’l, Inc., 751 F. Supp. 279, 284 (D. Mass. 1990).
This Article generates some strong conclusions. For example, it shows that settlements are promoted both by contribution protection rules and by rules giving contribution rights to settling defendants. The latter conclusion is significant because the legal regime has generally denied settling defendants such rights.\textsuperscript{207}

However, the reader who was hoping to learn from this Article whether, from the perspective of inducing settlements, joint and several liability is generally preferable to non-joint liability, or whether a pro tanto set-off rule is generally preferable to an apportioned share set-off rule might be disappointed. This Article identifies conditions under which joint and several liability performs better than non-joint liability, but shows that neither rule is consistently better than the other.\textsuperscript{208} We reach a similar conclusion with respect to the choice between set-off rules.\textsuperscript{209}

Despite the lack of easy answers in this area, our analysis has important implications for judges and policymakers. First, we show why any simplistic choice of one rule stems from a lack of appreciation of the complexity of the problem. Our approach improves upon the current understanding of the choice between settlement and litigation in cases involving joint tortfeasors. The courts reach different conclusions from the ones we present in this Article not because they are engaged in a different enterprise. Like us, they choose among the competing legal rules based, at least in part, on their predictions of which rule creates better incentives for the settlement of multi-defendant claims. Nor are the behavioral models employed by the courts more sophisticated than ours. Like us, the courts assume, at least implicitly, that plaintiffs seek to maximize their recoveries and defendants seek to minimize their losses.

In trying to answer the same questions, however, the courts systematically fail to focus on the complex, strategic relationships among the plaintiff and the various defendants under schemes of joint and several liability. As a result, their predictions concerning which rules perform better are the product, quite simply, of logical flaws. By forcing us to think systematically about the nature of the problem, the tools of economic analysis make possible a much deeper understanding of the incentives for the settlement of multi-defendant cases.

Second, we define conditions under which one set of rules performs better than others. For example, joint and several liability generally deters settlements when the plaintiff's probabilities of success are independ-
ent. Similarly, the pro tanto set-off rule performs better when litigation costs are low compared to the level of damages.

These insights might permit a decisionmaker to choose the best rules for different categories of problems. For example, as noted above, in a case in which the plaintiff charges that two defendants engaged in a conspiracy, the plaintiff’s probabilities of success are perfectly correlated. In those cases, the choice of joint and several liability would be comparatively more desirable than in cases in which the plaintiff’s probabilities of success are likely to be independent. Similarly, some types of litigation involve relatively more litigation costs than others. When litigation costs are higher, the choice of the apportioned share set-off rule would be relatively more desirable.

Third, our analysis suggests that the choice among the competing legal rules might be better made by administrative agencies than by common law judges. When presented with a particular case, judges are unlikely to be able to collect the data necessary to determine whether, for the bulk of cases in that category, the plaintiff’s probabilities of success are highly correlated, or whether litigation costs are high. These determinations are easier for administrative officials, who have better means of obtaining empirical information and easier access to the types of expertise necessary to analyze this information.

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210 See text accompanying note 154 supra.
211 See text accompanying notes 137-40 supra.
212 See text accompanying notes 23-24 supra. Therefore, it is not surprising that Easterbrook, Landes & Posner, supra note 24, and Polinsky & Shavell, supra note 24, who were primarily interested in antitrust conspiracies, assumed implicitly that the plaintiff’s probabilities of success would be perfectly correlated. See note 107 supra.