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Reflective Remedies

ABSTRACT. This Note aims to develop and describe a new type of penalty, the reflective remedy, to address the problem of optimal deterrence when the law is uncertain. It describes a novel remedial option for traditional legal disputes in which the activity level chosen by the defendant is "reflected" over the socially optimal level, and shows how this penalty theoretically improves on traditional options because of its scale-blind impact on incentives. As a result, this penalty will, in certain cases, better induce socially optimal levels of behavior by regulated actors. The Note also develops a method by which an ordinary trier of fact can implement this proposal when faced with complex legal standards and offers concrete examples where the proposed penalty could improve on the current status quo by realigning the incentives of the parties to more closely comply with the law.

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INTRODUCTION

Imagine you and your employer wish to negotiate a noncompete agreement.[1] And imagine you both agree to the maximum length for a noncompete agreement allowed in your jurisdiction. The problem, however, is that no one knows exactly what that length is. Instead, the jurisdiction you are in uses a balancing test to evaluate these agreements,[2] and while precedents set certain bounds on what might be permissible, they do not apply precisely to your particular circumstances.

This type of scenario is not an aberration; the application of the law is often uncertain. While some legal rules come in forms that are easy to apply, others are less straightforward. For example, restrictions on unconscionability,[3] anticompetitive contracts,[4] and actions that violate the duty of good faith[5] are all framed in abstract language that leaves room for uncertainty. Furthermore, enforcement is often far from consistent, even for relatively simple rules. As a result, individuals looking to obey the law often act under conditions of uncertainty, in which they are not sure whether their actions will or will not result in legal sanction.[6]

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1. Throughout this Note, I use the example of noncompetes to illustrate the workings of reflection and other penalties. Noncompete agreements offer a useful illustration because they are pervasive, easily understood contracts in which multiple fact-specific considerations are relevant in determining whether the contract is fair. As a result, it is difficult for policy-makers to eliminate uncertainty in this area. Moreover, while society may wish to allow these agreements, there is a longstanding recognition that overly burdensome noncompetes have negative consequences and should not be enforced. *See* Mitchel v. Reynolds (1711) 24 Eng. Rep. 347, 351, 352 (finding that "bare restraint[s] of trade" are void but that "reasonable and useful" noncompete provisions could be enforced).

2. *See, e.g.*, Scott v. Gen. Iron & Welding Co., 368 A.2d 111, 114-15 (Conn. 1976) ("In order to be valid and binding, a covenant which restricts the activities of an employee following the termination of his employment must be partial and restricted in its operation 'in respect either to time or place, . . . and must be reasonable—that is, it should afford only a fair protection to the interest of the party in whose favor it is made and must not be so large in its operation as to interfere with the interests of the public.'" (quoting Cook v. Johnson, 47 Conn. 175, 176 (1879))).

3. RESTATEMENT (SECOND) OF CONTRACTS § 208 (AM. LAW INST. 1981).

4. 15 U.S.C. § 1 (2018).

5. RESTATEMENT (SECOND) OF CONTRACTS § 205 (AM. LAW INST. 1981).

6. *See* Richard Craswell & John E. Calfee, *Deterrence and Uncertain Legal Standards*, 2 J.L. ECON. & ORG. 279 (1986) (discussing the general problem of optimal deterrence when application of the rule or standard is uncertain); *see also* Louis Kaplow, *Optimal Deterrence, Uninformed Individuals, and Acquiring Information About Whether Acts Are Subject to Sanctions*, 6 J.L. ECON. & ORG 93 (1990) (modeling optimal deterrence in the case of a population with both informed and uninformed individuals). In this context, uncertainty could have one of two

One solution would be to try to eliminate uncertainty in the law. But this task is often impossible in areas that we would like to regulate. Policy-makers struggle to formulate exactly which conduct should or should not be prohibited ahead of time. Moreover, exact rules, even if possible, can turn out to be undesirable. For example, a detailed code listing the maximum length of noncompetes for various professions would be cumbersome and would also limit the ability of the law to shift over time as new professions arise and existing ones evolve.

Of course, in some cases courts can slowly wring uncertainty out of the law through the creation of precedent without running into the problem of undesirable rigidity. Precedent, however, provides a highly imperfect solution because of its case-dependent nature. The inquiry about whether an individual building violates the implied warranty of habitability may tell us limited information about the exact application of that result to another building. Similarly, one decision on a noncompete clause applied to a particular profession, a particular state, and a particular time frame may be difficult to apply to another case with different facts.[7] While these precedents may shape the expectations of the parties and may determine the outer bounds of what is acceptable, in fact-specific cases precedent may fail to eliminate uncertainty.

This Note proposes an alternative means of mitigating the problems caused by uncertainty in legal rules.[8] In particular, it focuses on which damage remedies and contract modifications create optimal ex ante incentives when uncertainty is present.[9] I refer to these penalties as "reflective" remedies because they focus on penalizing defendants by an amount equivalent to their overreach.

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meanings. First, it can mean that the content of the law is easy to apply, but enforcement is uncertain, or second, that enforcement is certain but individuals are unclear about what the law requires. For the purposes of this Note, I consider only the latter type of uncertainty for reflection. That is, the individuals in question act without knowing what the law actually is, not out of uncertainty about enforcement.

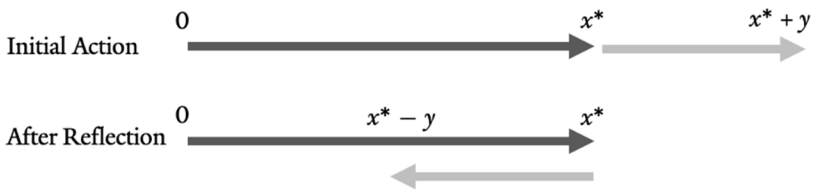
7. *See infra* Section IV.A.

8. *See generally* Isaac Ehrlich & Richard A. Posner, *An Economic Analysis of Legal Rulemaking*, 3 J. LEGAL STUD. 257 (1974) (describing the continuum between rules and standards and an economic model of the problem); Louis Kaplow, *Rules Versus Standards: An Economic Analysis*, 42 DUKE L.J. 557 (1992) (providing an overview of the debate and a detailed economic analysis of the different factors involved).

9. Of course, damage remedies exist on a spectrum, which can make it difficult to draw clear lines between new damage remedies and versions of older remedies. Similarly, reformation of overly strict contracts is a familiar remedy. As such, this Note does not make the claim that the proposed remedy is novel in form compared to previously studied remedies. Rather, just as scholars have theorized particular damage remedies that are worthy of special attention, such as double and treble damages, this Note claims to draw out the important characteristics of a class of remedies. Ultimately, it argues that these novel characteristics justify the inclusion

Reflection is most effective when applied to rules that specify a maximum "reasonable" level of activity, thereby punishing individuals who take more extreme actions. Such rules may, for example, set a maximum price that can be charged for a good or service or limit the duration of a noncompete clause. Reflective remedies look to the amount by which the defendant exceeded this level and then double this amount when assessing the penalty. This symmetrically "reflects" the defendant's position across the maximum reasonable level. More formally, if x^* is the socially optimal legal cap on some type of behavior (meaning that behavior at level $z > x^*$ violates the legal rule or standard) and the actor chooses level $x^* + y$ then, under reflection, the agent is "set back" by twice the amount of her illicit gain (by $2y$) to $x^* - y$. This is depicted in Figure 1. Her loss is symmetrical (and therefore proportional) to the level by which she exceeded the socially optimal point. Importantly, this reflection need not take the form of damages. Contractual terms may also be modified in a reflective manner. For example, a one-year noncompete clause can be "reflected" to six months if the court finds that nine months would be the maximum allowable restriction.

FIGURE 1.
ILLUSTRATION OF REFLECTION



This Note claims that when certain conditions are met, reflective remedies better induce ex ante compliance with legal rules compared to other damages remedies that have previously been considered for dealing with the problem of uncertainty—such as the use of damage multipliers. In short, when the probability of detection of wrongdoing is high and individuals are likely to have expectations about what the law requires that are accurate on average, reflection is likely to provide optimal ex ante incentives.[10] These situations are likely to occur most often when two parties are closely monitoring the behavior in question (for instance, in a contract negotiation between two sophisticated parties) or when one party is negotiating with a large number of other parties and therefore at

of what this Note calls "reflective" remedies into the standard catalogue of remedies. "Reflective" remedies are akin to double-disgorgement damages.

10. *See infra* Section III.A.

least one party is likely to detect overreach (for instance, in negotiations of consumer contracts or employment contracts).[11] Reflection forces individuals to choose behavior in the middle of their spectrum of beliefs about when the law will be applied.[12] Rather than encouraging individuals to be overly optimistic or pessimistic, reflection thus encourages individuals to choose their best guess about how the law will be applied. Therefore, under certain conditions, reflection will better incentivize ex ante compliance with the law.[13]

Note that I use maximum activity level and the socially optimal point interchangeably throughout the argument. The idea here is that under a standard economic analysis of legal rules we want to set the limits on conduct at the point that maximizes the total gain to society.[14] Thus, agreements should be banned if they exceed this point. Of course, for a variety of reasons, legal rules are often constructed such that the limits of what the law allows are not necessarily the behaviors which we wish for individuals to engage in consistently.[15] Still, reflection is a tool that exists to encourage individuals to choose the maximum of what is allowed. It should only be used when this maximum is actually socially desirable. Therefore, for the purpose of this argument the two notions are interchangeable.

The difference between ex ante compliance and ex post remedies matters to individuals—particularly those who have the least access to court-ordered justice. For example, courts have imposed the implied warranty of habitability to limit the ability of landlords to provide substandard housing.[16] This warranty requires landlords to maintain habitable property even if it is not specified in the lease. However, the warranty may raise rents in some cases, decreasing the housing stock that is available to low-income tenants.[17] The policy-maker must

11. *See infra* Section III.C.

12. Mathematically, reflective damages encourage individuals to choose the point where they believe that there is a fifty percent chance that they will face legal sanction for their action. This corresponds to the middle (or average) of the probability distribution in question. *See infra* Section II.B and Appendix A.

13. *See infra* Part III.

14. Formally, this will be the point where marginal private benefit equals marginal social cost. Where there are social benefits to the action as well, a subsidy might be needed to encourage private parties to internalize these benefits.

15. For example, while the First Amendment allows a variety of undesirable speech to avoid chilling valuable expression, this does not lead to the conclusion that it is socially optimal for individuals to constantly engage in undesirable speech.

16. *See* Javins v. First Nat'l Realty Corp., 428 F.2d 1071, 1077 (D.C. Cir. 1970).

17. See Richard Craswell, *Passing on the Costs of Legal Rules: Efficiency and Distribution in Buyer-Seller Relationships*, 43 STAN. L. REV. 361, 398 (1991) (arguing that some tenants will benefit while others will lose out under the mandatory rule).

therefore balance two difficult pressures. She wants to set the floor to ensure that the housing provided is high quality while also balancing the need to not overregulate the market and limit the availability of housing. However, even after setting this floor, the choice of remedy for violations can upset the balance that has been chosen. A penalty that is too harsh may cause landlords to overcorrect; a penalty that is too weak will encourage landlords to cheat by providing substandard housing. Thus, the choice of remedy is critical to protecting both the tenants who rent housing and the broader population of tenants in need of housing. In other words, a law-and-economics analysis in this case can be critical to preserving the distributional equilibrium that society has chosen.[18]

Before proceeding, it is also worth clarifying that this Note is about the terms of agreements, not the remedies for breach.[19] For example, it is concerned with what to do when the parties write a noncompete that violates the law of the jurisdiction because it is overly onerous. It is not concerned with what to do if an individual violates a noncompete agreement. The idea is to incentivize parties to choose particular terms, not to alter when parties choose to breach. In the case of a breach of contract, there is a well-developed literature on why contract law protects the expectation interest, as well as critiques of that approach.[20] For reasons outlined later, I focus on disputes in which the form of the contract *itself* is at issue and argue that in those disputes, reflection presents an improvement over existing remedial options.[21]

Moreover, this is a proposal dedicated to achieving socially optimal compliance *without* a need for litigation. It may be true that litigation can often be used to make an individual whole. But a simplistic focus on after-the-fact remedies fails to account for the barriers that individuals face in accessing justice, as well as the financial and temporal costs that all litigants must incur. Any discussion

18. *See infra* Section III.B.

19. *See infra* Section III.A. While I focus on contracts in this Note, there is no reason why the reasoning here cannot be expanded to other areas of law, such as torts. *See infra* Section IV.E.

20. *See, e.g.*, Melvin A. Eisenberg, *Actual and Virtual Specific Performance, the Theory of Efficient Breach, and the Indifference Principle in Contract Law*, 93 CALIF. L. REV. 975, 977 (2005) (noting that expectation damages often fall short of making individuals indifferent between performance and nonperformance); Daniel Markovits & Alan Schwartz, *The Myth of Efficient Breach: New Defenses of the Expectation Interest*, 97 VA. L. REV. 1939, 1948 (2011) (presenting the "dual performance hypothesis" as a novel defense of remedies based on the expectation interest); Alan Schwartz, *The Case for Specific Performance*, 89 YALE L.J. 271, 271 (1979) (arguing that "the remedy of specific performance should be as routinely available as the damages remedy").

21. *See infra* Section III.A.

of remedies should thus focus also on limiting the number of violations that occur in the first place. Reflection pursues this particular goal.[22]

Reflection has two important mathematical properties that allow it to function well in cases where the stakes of action are high and where existing penalties may encourage individuals to overcomply by choosing behavior below the socially optimal cap, for fear of triggering a harsh penalty. First, reflection is scale blind, in the sense that its impact on behavior is independent of the stakes of action.[23] Thus, it applies similarly to transactions where the value at stake is two hundred dollars and transactions involving two million dollars. Second, reflection functions independently of the range of possible outcomes,[24] while other remedies sometimes generate socially inefficient overcompliance as the range increases.[25] In particular, remedies that threaten to void the contract as a whole are more likely to lead to overcompliance as the stakes rise. This is intuitive; individuals will be more likely to take risks for some extra gain when the contract value is small but are likely to take fewer risks if voiding the contract would result in large losses.[26] As a result, while I do not claim that reflection in these cases will always lead to optimal behavior, I argue both that reflection can often provide an improvement over existing remedies and that reflection can be feasibly implemented by adjudicators.

This Note proceeds in four parts. Part I examines the general problem of optimal deterrence under uncertainty. It discusses the solutions that have previously been proposed as well as the difficulties with those solutions. Part II then fleshes out the proposed reflective remedy and describes its properties. Additionally, it develops a judicially manageable implementation of reflection for "higher-dimensional" spaces. Part II also discusses how the reflective remedy overlaps with, extends, and differs from familiar supercompensatory remedies such as double and treble damages. Part III then discusses the limitations of reflection and develops general criteria that determine when reflection can be successfully

22. There is a perspective on remedies that they exist to spread risk for harms rather than to deter harms in the first place. While this is true in some cases, it is not true in the cases here. The situations I am discussing are not ones in which the harm is uncertain—as it is in the case of medical procedures gone awry—but rather those situations where the application of the standard to a question is unclear.

23. *See infra* Section II.B.

24. "Possible outcomes" is meant in the sense of the standard deviation of the distribution. *See infra* Section II.B.

25. *See infra* Section II.B.

26. For example, imagine that the contract is worth twenty dollars to me. I might be willing to drive a hard bargain in this case because if the contract is struck down the loss is small. In contrast, if the value is two million dollars then I will likely attempt to avoid at all costs the prospect that a court will strike it down.

applied. Finally, Part IV explores concrete applications of reflection to existing legal doctrine.

I. REMEDIES AND DETERRENCE

One crucial aspect of contractual policy design is the choice of remedy.[27] Even once the legal rule is chosen and the enforcement regime is specified, the penalty will have a significant effect on the behavior in question.[28] For example, consider a jurisdiction in which any price for apples over ten dollars is considered unconscionable. Assume that detection of violations in this jurisdiction is perfect, but that the policy-makers are choosing between two potential penalties. First, the policy-makers could follow the Restatement approach and require any violating sellers to offer their apples for ten dollars instead.[29] Alternatively, the policy-maker could choose to void any contract with an unconscionable price, leaving the violating seller with a net benefit of zero.[30]

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27. There are several other factors that must be considered. Additional factors that may influence policy choices include the cost of seeking out legal advice, Kaplow, *supra* note 8, at 572-77, the cost of litigation, Ehrlich & Posner, *supra* note 8, at 265-66 (discussing how the complexity of a law can lead to higher costs as "an increase in the number of issues to be litigated will lengthen the trial"), and other costs of enforcement, *see, e.g.*, Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169, 174-76 (1968) (modeling the cost of apprehension and conviction). Critically for uncertain rules, the development of the law through precedent may change uncertainty as well. Over time, as the rule or standard is applied to new fact patterns, the outcomes of these cases and application of stare decisis generate additional certainty about how the rule or standard will be applied. Whether precedent is created is therefore relevant to the social cost of a rule or standard. If a rule or standard discourages litigation (e.g., through small potential rewards) plaintiffs may not bring cases and therefore the law may not develop. Potentially, behavior might also reach some equilibria (socially desirable or not) that may generate reliance interests that influence the eventual legal challenge. For example, allowing an industry to evolve around clickwrap while the application of existing contract law doctrine was uncertain may have influenced courts who eventually reviewed these challenges. This sort of scenario, where the standard and its standard remedies do not create incentives to litigate minor violations, may be one heuristic for where to apply stickier default rules. *See* Ian Ayres, *Regulating Opt-Out: An Economic Theory of Altering Rules*, 121 YALE L.J. 2032, 2084-88 (2012).

28. Classically there is a distinction between rules and standards. The idea is that a rule is a sharp restriction (e.g., no prices above $\$X$) while a standard is a more amorphous policy (e.g., no unreasonable prices). For an overview of the distinction, see sources cited *supra* note 8. For the purpose of this Note, the distinction is irrelevant, though it is likely that most of the uncertain laws in question will be formulated as standards rather than rules.

29. *See* RESTATEMENT (SECOND) OF CONTRACTS § 208 cmt. g (AM. LAW INST. 1981); *see also infra* Section IV.C (discussing the application of the proposed remedy to price unconscionability).

30. As noted above, this is not the default remedy for this situation. But the remedy of voiding the contract is applied in other areas of the law. *See, e.g.*, Pitney Bowes, Inc. v. Berney Office

We can see clearly that the choice of penalty will matter in this case. If the seller is aware that she will receive a reasonable price, then she will likely try to market her apples at a price of, say, twelve dollars, knowing that when she is caught (after all, enforcement is perfect), she will receive ten dollars anyway. In the case in which the contract is void, the seller will do no such thing, preferring instead to avoid the potential loss of all of her revenues.

Of course, the example above is simplistic. Even in cases in which the action of the seller is sure to be challenged, the content of the law is often uncertain. The seller will not know that the maximum "conscionable" price in the jurisdiction is ten dollars. Instead, she must choose to sell at a given price, knowing that the more she charges, the more likely it is that she will violate the law and face a legal sanction. The seller will look to maximize her profits in the shadow of this uncertainty, attempting to choose a price that maximizes her expected profits when the prospect of legal sanction is accounted for.

This problem is not limited to price unconscionability. Actors whose behavior is regulated by standards that limit "unreasonable" behavior must often make judgments about what action to take such that they will maximize their own welfare without creating too much risk that they will face legal sanction. For example, a landlord looking to comply with the standard imposed by the implied warranty of habitability must, in some jurisdictions, make a judgment about which regulations implicate "health and safety."[31] Oftentimes, doing so will require a difficult balancing between increasing profits and avoiding sanctions.

Once uncertainty is taken into account, the question of optimal remedies becomes significantly more complicated.[32] The remainder of this Part reviews the relevant literature, focusing on the well-known model developed by Richard Craswell and John E. Calfee to study the performance of classical remedies under

Sols., 823 So. 2d 659, 662 (Ala. 2001) (noting that contracts that do not fall into the statutory allowances are void in Alabama).

31. *See* THOMAS W. MERRILL & HENRY E. SMITH, PROPERTY: PRINCIPLES AND POLICIES 695-96 (2d ed. 2012) (considering the features of rental housing that implicate "health and safety"); *see also infra* Section IV.D (discussing the application of reflective remedies to the implied warranty of habitability).

32. For the purposes of this Note, uncertainty refers to the probability that an individual will face a legal sanction because of how the law is applied rather than the probability that a violation is detected. See *supra* note 6. Reflective remedies work best where the parties are uncertain about what the law requires—that is, how it will be enforced, not whether it will be enforced. For example, if we assume the socially optimal noncompete is one year long, but employers know that there is a zero percent chance that the law will be enforced for any contract less than two years, then optimal deterrence will be impossible. Employers will never comply with the law because they can choose two years with no cost. It is only in cases in which the law will be enforced around the socially optimal value that remedies can be used to encourage individuals to pick the desired options despite uncertainty.

uncertainty. It also assesses the performance of familiar remedies under this model and highlights their various shortcomings.

A. Uncertainty, Deterrence, and the Problem with Traditional Damages

In their 1986 article, Craswell and Calfee observe that if parties knew exactly what the law required of them in every situation, the only remaining policy concern would be to ensure consistent enforcement.[33] In other words, in such a world, legislators would primarily seek to force parties to internalize the costs of their actions. The problem, however, is that outside of rare circumstances, "legal standards . . . are seldom certain" and are often framed in vague terms (such as "reasonableness").[34] Craswell and Calfee note that even precise rules are subject to uncertainty as neither enforcement nor litigation outcomes are certain.[35] And to complicate matters even further, the actual level of uncertainty typically depends, at least in part, on the behavior of the regulated parties. Parties who engage in more extreme behavior are often more likely to face punishment than those who only mildly push the boundaries of what is acceptable.[36] For example, the police are much more likely to enforce the law against a driver who chooses to drive at sixty miles per hour through a school zone than they are to pursue a driver who drives five miles per hour over the limit on the highway. Craswell and Calfee find that, when the probability of enforcement is a function of the parties' actions rather than a constant, the traditional approach to damages—in which the offender must pay the value of the harm to the victim—suffers from a key problem. Rather than encouraging individuals to choose the socially optimal point, this approach typically encourages *overcompliance*, with people choosing some level of action less than the socially optimal one to avoid the potential penalties.[37] Because the probability of enforcement rises with action, individuals take special care to avoid more aggressive action, sometimes at the cost of socially efficient behavior. Craswell and Calfee also find that as the potential value of the

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33. Craswell & Calfee, *supra* note 6, at 279 ("When private parties know exactly what a legal rule requires of them, sufficiently large penalties combined with a sufficiently high probability that violations will be penalized should create incentives for exact compliance with the rule.").

34. *Id.*

35. *Id.*

36. *Id.* at 280. Note that this conclusion is consistent with the notion that different parties face different base levels of enforcement based on their identities. The only assumption made here is that for all parties the probability of enforcement rises as parties pursue more extreme conduct. While differential enforcement is a depressing reality in certain areas of law, this assumption is unaffected by that reality.

37. *Id.* at 299.

action rises, the defendant is similarly more likely to overcomply. While overcompliance can be valuable in some cases, it can also deter the sort of risk-taking that is good for society.[38] That is, if the value at stake is two thousand dollars rather than two hundred, the likelihood of overcompliance increases.[39] In sum, when uncertainty is added to the puzzle, traditional remedies will likely deter efficient activities, particularly in high-stakes activities where an "optimal" result may be particularly valuable.

Craswell and Calfee's article develops the following model to study the problem of uncertainty. First, assume that behavior is denoted by some value x, with higher values of x denoting more "extreme" behavior.[40] For example, x can be the price that a seller charges or the restrictiveness of the covenant they wish to sign with their employees. Furthermore, assume that taking this action has some private benefit to the agent[41] as well as some social cost.[42] The social cost of action is the cost that the community bears in exchange for the private benefit. Actions are efficient when they have higher private benefit than social cost.[43] To represent the optimal cap on behavior, we let x^* be the point where marginal private benefit equals marginal social cost—that is, the socially efficient amount of the activity in question.[44] We assume that the jurisdiction in question wishes to prohibit all action beyond this point.[45]

Finally, to capture the uncertainty around whether the party will face a legal sanction, there is a probability of punishment for every value x.[46] Moreover, the

38. For example, we might want parties to be willing to offer lower-quality housing to increase access. *See infra* Section IV.D.

39. Craswell & Calfee, *supra* note 6, at 282. To see this, note that in the second term of their equation (1) we have that $B(x^*) = L(x^*)$. Thus, as the private benefit at the social optimum rises the equation is more likely to be negative, a result that is consistent with overcompliance.

40. *Id.* at 280-81. Values of x are taken to be real.

41. Denoted by $B(x)$. *Id.* at 280.

42. Denoted by $L(x)$. *Id.* at 280.

43. To be precise, these actions are Kaldor-Hicks efficient, because the gains could be redistributed so that all parties are better off, even though they technically only accrue to the agent. *See* ROBERT COOTER & THOMAS ULEN, LAW & ECONOMICS 42-43 (6th ed. 2011).

44. Formally, x^* satisfies $B'(x^*) = L'(x^*)$. Craswell & Calfee, *supra* note 6, at 281. Note that because this is a mandatory rule for all agreements, the notion of private benefit is somewhat stylized here because the rule applies to numerous people with different utility functions. The point is rather that the law chooses this cap for externality reasons.

45. *See* Ayres, *supra* note 27, at 2084 (noting that rules are typically classified as either mandatory rules or default rules).

46. Formally, $P(x)$ is the cumulative density function of some probability density function on the real line given by $p(x) = P'(x)$. Craswell & Calfee, *supra* note 6, at 281.

probability of punishment increases as x increases. This model creates an optimization problem for the agent in which she attempts to maximize her private benefit while taking into account the possibility that she will have to pay damages if she violates the law.[47] The damages in the model are set to the amount of harm caused by the action in question. That is, if the agent violates the law by taking action x, and the cost of action x to others is one hundred dollars, then damages will be set to that amount.

Craswell and Calfee then apply the model to determine how the individual will act in this case.[48] They find that individuals optimize by considering the marginal benefit and cost of their action discounted by probability.[49] To see how these two factors work, consider the following example. The landlord values a warranty of habitability at $100 and believes that the probability of punishment is fifty percent. If there is punishment, the damages will be $100—that is, she will lose the value of the contract. She then considers whether to take an action that will net her a gain of $101. On the positive side, she will have around a fifty percent chance of gaining an extra dollar of value (since there is already a fifty percent chance that the law is enforced). On the other hand, taking the extra dollar comes at a cost of increased probability that she will have to pay damages.[50]

Depending on which effect is larger, the agent will either overcomply or undercomply with the rule or standard.[51] For example, if the agent is particularly worried about the possibility of paying damages, and if she is more risk averse, she may choose to pick a point below the social optimum to avoid the risk of legal sanction, even if there is the potential of taking on more risk for more gain. Alternatively, if the gains in question outweigh the cost of more risk, the agent may exceed the optimal level of action.

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47. Formally, the optimization problem is:

$$\max_{x} U(x) = B(x) - P(x)L(x)$$

Id. at 280-82.

48. Formally, they differentiate and evaluate at x^*, which gives:

$$dU/dx\,|_{x^*} = [1 - P(x^*)]L'(x^*) - P'(x^*)L(x^*)$$

Here, they have used the fact that at the optimum, marginal cost equals marginal benefit ($B'(x^*) = L'(x^*)$) to simplify the equation. *Id.* at 282. When this second equation equals zero, the individual's utility will be optimized and therefore they will choose to take this action.

49. *Id.*

50. This is somewhat of a simplification of the calculus in question. If the agent moves up to $101, then the probability of forfeit will be somewhat above fifty percent as we assume that the probability of paying damages increases with the value of the action. However, this example captures the intuition of the Craswell and Calfee first-order condition.

51. Craswell & Calfee, *supra* note 6, at 282.

Consider the previous example, except with the total amount at which the agent values the action at $200 and the potential damages doubled to $200. The agent asks whether, on the margin, it is worth attempting to benefit by an additional $1. Again, the agent will have about a 50 percent chance of getting the extra dollar of benefit. However, now she will consider the increased risk of losing all $200. While the marginal benefit is the same, the marginal cost of taking this action is now higher. As such, we see that the greater the value at stake, the stronger the deterrence is, even though the probability of enforcement is the same.[52] Stated differently, changing the value at stake alters behavior even without altering the nature of the enforcement regime. An increase in scale thus increases the incentives for the defendant to overcomply to avoid the possibility of a large loss.[53]

Without saying more about private-benefit and social-loss functions of the individual, it is impossible to say whether the individual will over or undercomply, and the result will depend on the "amount" of uncertainty.[54] However, Craswell and Calfee draw some general conclusions about the behavior of these penalties.[55] In particular, they conclude that in most cases, damages that are equal to the full social cost will tend to lead to overcompliance and therefore this damage rule will be suboptimal.[56] They note that, as a result, damage multipliers that *relax* the penalty may be needed to ensure optimality, though the exact multiplier will vary based on the factual scenario.[57] In other words, when uncertainty is present, the traditional damage remedy of making the defendant pay the social cost of her action fails to solve the issue.[58]

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52. This is to say that this penalty is not *scale blind*. *See infra* Section I.B.

53. Craswell & Calfee, *supra* note 6, at 289.

54. *Id.* at 283. "Amount" refers to the standard deviation. *Id.* at 285. Though, interestingly, the equation shows that even in cases where the penalty is limited to the social cost, perfect detection is not necessary to achieving optimal deterrence. The introduction of the possibility of paying no penalty at all creates the incentives to comply. Of course, we may still want perfect enforcement anyway for distributional reasons.

55. In particular, they look at the effect of the shape of the uncertainty, changes to the benefit and loss functions, and alternative penalty structures. *Id.* at 283-90, 292-98.

56. *Id.* at 299.

57. *Id.* at 292-95, 299 ("It is still theoretically possible to use damage multipliers or fines that would improve defendants' compliance incentives . . . . Even though the optimal adjustment cannot be calculated exactly, crude guesses about the direction of the adjustment may be possible.").

58. Interestingly, they note a solution to the model in which the court pays a lump sum to defendants who overcomply (in a sense paying them reverse incremental damages for overcompliance) and explain that this solution would perfectly solve the problem. *Id.* at 296 n.23.

B. Punishment and Deterrence

Of course, even if we accept that the typical approach to damages does not work, policy-makers are not limited to imposing social cost as the only potential penalty. Rather, there are several potential options that a policy-maker can choose from the traditional damages toolbox. This Section reviews these options and explains why they do not always offer satisfactory solutions to the problem of enforcement under uncertainty.

1. Strong and Weak Penalties

In general, we can group the penalties individuals might face for violating a rule or standard into two categories.[59] The first category consists of "strong" penalties, which impose harsh punishment at the point at which an action tips into "wrongful" territory, even if the action is relatively close to what would be permissible.[60] The second category consists of "weak" penalties, which only punish the harm caused by the "wrongful" part of the action.[61] The theory behind weak penalties is that agent action up to x^* and the social cost created by that action should not be punished and that the defendant should instead only be responsible for the harm caused by the inefficient "excess" activity.[62]

To see the difference concretely, consider again the individual who faces a jurisdiction in which the maximum permissible price is $10, and assume the individual chooses to charge $12 instead. The strong penalty forces her to give up all her gains in this case, leaving her with $0. In contrast, the weak penalty only forces her to give up the "wrongful" $2, leaving her with $10 as a result of the transaction.[63]

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59. *See id.* at 292-98. Craswell and Calfee also discuss the possibility of constant fines as a potential penalty. However, constant fines still must be calibrated to attempt to internalize some level of cost. As a result, constant fines are not a standalone category but rather may still be categorized with other penalties based on the level of the fine.

60. These penalties create a discontinuity in the problem the agent faces. For example, if the state only punishes inefficient conduct, then an action that creates $101 in private benefit and $100 in social cost will be allowed with no damages. However, an action with only $99 will be punished with a $100 fine. While the difference in activity level is small, the change induces a significant change in the welfare of the actor.

61. Craswell and Calfee refer to these as "Incremental Damages." Craswell & Calfee, *supra* note 6, at 295-97.

62. *Id.* at 296.

63. This dichotomy bears some resemblance to Calabresi and Melamed's famous distinction between property and liability rules. Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972). In

Strong and weak penalties are not simply limited to the realm of monetary damages. For example, if a seller fails to use only Reading pipe in the construction of a house, allowing the buyer to withhold payment under the perfect-tender rule could be seen as a "strong" penalty, whereas awarding only diminution in value is a "weak" penalty.[64] In the former case, any "wrongfulness" voids all obligation; in the latter case, the seller must only compensate the buyer for the portion that is "wrongful." As a second example, take the remedy for an overly broad covenant not to compete. Some courts choose to strike down an overly broad noncompete in its entirety.[65] Others follow a "strict blue pencil doctrine," which allows the court to "strike out an unreasonable provision, if separable, and enforce the remainder of a covenant as written."[66] Yet others use a "liberal blue pencil" rule where the judge has "greater authority to strike out or modify an unreasonable portion of a covenant" to make it "reasonable" rather than voiding the covenant altogether.[67] The first remedy is an example of a strong penalty, the latter two are examples of a weak penalty.

However, neither approach is perfect. Strong penalties, like the damages in the Craswell-Calfee model, tend to lead to overdeterrence.[68] As such, they can discourage individuals from taking socially beneficial action by making them overly concerned about the potential to forfeit their gains. Weak penalties create the opposite difficulty. Because the individual in question must only pay for the gains from wrongful action, there is no reason to limit the wrongful action when punishment is uncertain. At best, the defendant would "get away" with the wrong in question, and at worst she would still obtain the legally permitted

this analogy, "strong" penalties are analogous to property rules, whereas "weak" penalties are more analogous to liability rules. In some cases, this comparison will be apt. For example, the contrast between trespass (which may force the violator to pay a large penalty) versus nuisance (in which only damages are owed) is a good example. However, in some cases, the distinction does not track as clearly. For example, strong and weak penalties can also be versions of liability rules. For example, if I pollute over the socially allowable threshold, society can choose to hold me liable for the full value of my pollution or to hold me simply liable for the harm caused by the excess pollution. However, in both cases, the amount I pay is based on the harm done, making these both liability rules.

64. *See* Jacob & Youngs, Inc. v. Kent, 129 N.E. 889 (N.Y. 1921) (describing this scenario as well as the possible remedies).

65. Jon P. McClanahan & Kimberly M. Burke, *Sharpening the Blunt Blue Pencil: Renewing the Reasons for Covenants Not to Compete in North Carolina*, 90 N.C. L. REV. 1931, 1935 (2012).

66. *Id.*

67. *Id.* Parties also may contract for such modification. *See, e.g.*, Emerick v. Cardiac Study Ctr., Inc., 357 P.3d 696, 703 n.5 (Wash. Ct. App. 2015) (noting that the employee agreed that if the provision was found to be too strict, then the agreement should be enforced to the maximum extent allowed).

68. *See supra* text accompanying note 56.

profit.[69] Moreover, as the discussion above shows, the strong penalty is not *scale blind*; as the value at stake increases, our employer will be more likely to overcomply. If she values the two-year contract at $2,000, she will be less likely to choose the optimal result than she would be at $1,000. Thus, it is likely that strong penalties will produce a range of outcomes in cases where the values at stake vary widely from case to case. In short, strong penalties may encourage overcompliance and weak penalties may encourage undercompliance. Neither penalty provides a compelling solution to the problem of optimal deterrence.

2. *Hybrid Penalties*

One method for resolving the difficulties with strong and weak penalties is to take a hybrid approach that utilizes both penalties in combination. Under this penalty structure, the court will allow slight deviations from the optimal level by imposing only incremental damages for these transgressions. For greater overreaches, however, a strong penalty might be applied. For example, where prices are slightly excessive, they could be replaced with a reasonable price. However, where prices are grossly excessive the seller could receive nothing in return. Such an approach would essentially be designed to punish agents who act to take advantage of the law while behaving leniently towards those whose behavior suggests a good-faith attempt to comply with the legal regime.[70]

This strong/weak hybrid penalty is familiar from several places in the law and provides a backstop against abuse of a weak-penalty regime. For example, claims of bad faith act as a strong-penalty backstop to certain areas of contract law. A buyer whose house is not fully completed with Reading pipe, by default, receives only a weak remedy; but she has access to stronger remedies if she successfully claims that the contractor has acted in bad faith. Contractors working under the substantial-performance standard therefore retain some additional legal incentive not to stray too far from the specified performance.[71] Similarly,

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69. *See, e.g.*, Harlan M. Blake, *Employee Agreements Not to Compete*, 73 HARV. L. REV. 625, 683 (1960) ("If severance is generally applied, employers can fashion truly ominous covenants with confidence that they will be pared down and enforced when the facts of a particular case are not unreasonable. This smacks of having one's employee's cake, and eating it too."); Craswell & Calfee, *supra* note 6, at 296 ("[Under incremental damages,] defendants can always increase their expected benefits by choosing some value of x greater than x^*.").

70. Mathematically, there are two values of interest, x^* and $\hat{y}$. As before, x^* is the socially optimal level of behavior, and behavior above x^* triggers a weak penalty. $\hat{y}$, on the other hand, represents the maximal level of behavior above x^* that does not trigger the strong penalty. Therefore, behavior at any level beyond $\hat{y}$ is punished with a strong penalty.

71. This is aside from any separate economic and reputational incentives not to be known as a contractor or seller who is unable to follow instructions.

while employers in liberal blue-pencil jurisdictions[72] can theoretically negotiate highly restrictive employment contracts because they know that courts will replace overly broad contracts with reasonable restrictions, employers who abuse this freedom may find themselves accused of bad faith and therefore subject to more punitive sanctions.[73]

Still, these penalties, while an improvement over weak ones, remain imperfect. While violators must steer clear of the zone in which a strong penalty will be applied, there is still no reason to attempt to actually comply with the optimal point. As long as one remains within the realm of the weak penalty, overreach is an optimal strategy, just as it is with ordinary weak penalties.

3. The Multiplier Principle and Supercompensatory Damages

An additional possible solution to the problem of optimal deterrence under uncertainty is the use of supercompensatory damages. Supercompensatory damages suggest that when the probability of enforcement is p, where $p < 1$, then the optimal penalty is the full damages multiplied by $1/p$.[74] For example, if the probability of detection is 1/3, the penalty should be three times the full amount of damages. Similarly, if the probability of enforcement is fifty percent, then the damages should be double the usual amount. Where the probability of enforcement is constant, this value mathematically leads to optimal behavior. Therefore, in theory, the multiplier principle solves the problem of optimal deterrence.

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72. That is, jurisdictions in which courts will modify unreasonable contracts. *See* McClanahan & Burke, *supra* note 65, at 1935.

73. Examples of this penalty structure are not limited to contract law. Punitive damages in tort law have a similar structure. Individuals acting within ordinary bounds typically face only compensatory damages for harm. RESTATEMENT (SECOND) OF TORTS § 901 cmt. a (AM. LAW INST. 1979) ("[T]he law of torts attempts primarily to put an injured person in a position as nearly as possible equivalent to his position prior to the tort."). However, outrageous conduct can trigger punitive damages to deter future bad behavior. *Id.* § 908(2) ("Punitive damages may be awarded for conduct that is outrageous, because of the defendant's evil motive or his reckless indifference to the rights of others."). Similarly, while negligent failure to pay taxes results in the addition of a fine of twenty percent of the underpaid amount, I.R.C. § 6662(a) (2018), deliberate attempts to evade taxes can result in stricter criminal penalties, *id.* § 7201. These examples reveal that, where the default penalty is weak, the law often builds in additional mechanisms that punish individuals who attempt to take advantage of the relative leniency of the default.

74. Craswell & Calfee, *supra* note 6, at 292-93; *see* Richard Craswell, *Deterrence and Damages: The Multiplier Principle and Its Alternatives*, 97 MICH. L. REV. 2185, 2186 (1999) ("For example, if a violation faces only a 25% (or one-in-four) chance of being punished, on this view the optimal penalty would be four times the harm caused by the violation.").

However, there are two issues with this possible solution. First, the multiplier principle assumes a constant probability of detection regardless of the magnitude of the violation, a scenario unlikely to occur very often. A more egregious violation will typically be easier to catch than a less egregious one, so the probability of detection, and in turn enforcement, will vary.[75] Second, Craswell and Calfee's work on deterrence suggests that, if anything, the optimal multiplier should be *smaller* than one.[76] After all, if the imposition of damages is likely to overdeter individuals, then the imposition of double or triple damages is likely to further overdeter the same individuals.[77] A multiplier smaller than one would represent a departure from the traditional multiplier principle, which *increases* damages to account for uncertain enforcement.[78] The idea of a smaller multiplier is not necessarily problematic on its own, but it is unmoored from any simple correspondence with the probability of detection.[79] Essentially, such a multiplier would rely on the Craswell and Calfee view of the situation while adopting their

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75. In theory, we could instead adopt a multiplier based on the probability of enforcement at each activity level. This approach additionally would assume that the judge or jury is able to calculate the cost of detection in the case of a particular individual action. Such an approach seems difficult to apply in practice. However, as Craswell and Calfee note, "[U]nder this rule the smallest multipliers would be given to those defendants convicted of the most outrageous violations, as [the probability of enforcement] . . . was presumably very large for these defendants . . . [and] the largest multipliers would go to those defendants unlucky enough to be convicted of purely marginal violations." Craswell & Calfee, *supra* note 6, at 292-93. Such a result, while perhaps sufficient to induce optimal behavior, seems wildly out of line with ensuring justice.

76. *See* Craswell & Calfee, *supra* note 6, at 292-95; *see also* Craswell, *supra* note 74, at 2200 ("Indeed, if the probability of punishment were to decline even faster with each improvement in a defendant's behavior, the optimal constant multiplier would be even smaller—and could even be less than one, implying that even compensatory damages would be too high.").

77. A constant multiplier that exactly encourages optimal behavior can be constructed, but it is dependent on a complicated function: the probability distribution and the social-damages function. Craswell and Calfee explicitly solve the equation for the optimal multiplier M^* and obtain the result:

$$M^* = \frac{L'(x^*)}{P(x^*)L'(x^*) + P'(x^*)L(x^*)}$$

Craswell & Calfee, *supra* note 6, at 293-94. While this computation may be possible in some cases, it requires knowledge of the subjective perceptions of the regulated individuals to work perfectly. If two individuals differ in their perceptions of the uncertainty, they will have different "optimal multipliers," limiting the efficacy of this approach.

78. *See supra* note 57 and accompanying text.

79. This is because a multiplier lower than one would, in the traditional model, correspond to a probability of detection of over one hundred percent.

recommendations in a somewhat arbitrary way.[80] Additionally, note that traditional multipliers are only applied to damages and have no equitable analogue, limiting their application to other situations.

In summary, when we care about encouraging individuals to choose the socially optimal level of a particular behavior, existing penalties will often fall short. In particular, weak and hybrid penalties will frequently encourage undercompliance, while strong penalties and supercompensatory damages will often induce overcompliance. In response, the next Part proposes an alternative that symmetrically and proportionally penalizes individuals for overstepping the rule or standard. While I do not claim that such a "reflective remedy" can and should displace all traditional penalties, I do argue that under the right conditions, reflection better encourages socially optimal behavior.

II. REFLECTIVE REMEDIES

The reflective remedy aims to provide an alternative to the traditional solutions outlined in Part I. Instead of a strong or weak penalty being imposed, actions that exceed the maximum level of "reasonableness" are "reflected" over the reasonable level and are therefore punished in a manner proportional to their overreach. This symmetry helps induce optimal behavior by discouraging both overcompliance and undercompliance. Most importantly, under certain conditions the remedy induces optimal behavior even when the enforcement or application of the rule or standard is uncertain.

This Part proceeds in four sections. Section II.A outlines the reflective remedy in greater detail. Section II.B describes how this remedy alters behavior in static and dynamic models of behavior. Section II.C briefly discusses the potential application of reflection to contracts that feature multiple terms (such as geography and time in a noncompete clause) and shows that variations on reflection can be applied in such cases. Section II.D then compares the proposed remedy to supercompensatory damages and discusses how reflection extends the use of supercompensatory remedies to situations in which the contract is modified by the judge as a remedy.

80. More precisely, an exact multiplier, as noted above, can be set for any individual situation. *See supra* note 77. But computation of this value is dependent on both the utility and subjective probability functions of the individual regulated actor. Even assuming these could be computed and actors could be alerted about this new approach, it would result in a justice system in which individuals were punished in highly variable ways for the same conduct based on facts about their subjective mental beliefs. While it is true that penalties often ask about the private benefit of action to the individual—say, in the case of disgorgement—and that the law occasionally considers subjective belief, such a result would be very odd as applied here.

A. Defining the Proposed Remedy

Reflection is a double-disgorgement remedy that applies to defendants who exceed the level of reasonableness established by a rule or standard.[81] Formally, where the defendant chooses level $x^* + y$, which exceeds the level of "reasonableness" by an amount y, the reflection penalty sets the defendant to $x^* - y$, penalizing her by twice the benefit of the illicit gain. This remedy functions as an intermediate, proportional penalty in the weak/strong taxonomy discussed above.[82] Violating defendants retain more than nothing, but they are nonetheless punished more harshly than they would be under a weak-penalty regime.[83] For

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81. The restriction to defendants is somewhat artificial. The majority of cases in which reflection is likely to be applied are those in which reflection is used to regulate the defendant who might wish to take advantage of an overly strict contract. *See infra* Part IV (discussing potential applications of reflection). Of course, in some cases, the party whom reflection is designed to regulate will not be the defendant in the lawsuit. For example, in the bargaining cases discussed later, there may be no plaintiff or defendant, or reflection may be used to regulate both parties. *See infra* Section IV.B.

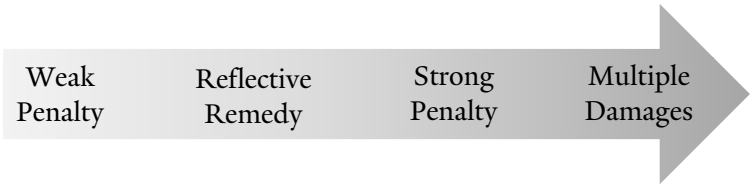
82. This transformation between weak and strong penalty is also continuous based on the action of the defendant. That is, as the individual moves to more and more egregious behavior, the penalty starts similarly to the weak penalty but continuously increases until it equals the strong penalty. This avoids some of the issues with discontinuous structures. For example, in the Craswell & Calfee model discussed above, the fact that full social damages are only imposed with probability $P(x)$ creates large uncertainties even for individuals who are complying with the rule or standard. The strong penalty can produce large disparities between similarly situated parties depending on whether the penalty is enforced against them. *See supra* Section I.A.

83. Where the individuals are risk neutral, the discussion above suffices to describe reflection. Since their utility functions are linear, reflection to $x^* - y$ reflects their utility as well as the concrete terms (e.g., number of years). When individuals are risk averse, the situation is slightly more complicated. In this setting there are two plausible choices for reflection: (1) utility reflection where the violating individual is assessed damages that set her utility back to what it would have been if the conduct itself was reflected, setting them to $U(x^* - y)$, or (2) disgorgement reflection where she is required to give up double the amount of her "illicit" gain (hence the reference to disgorgement) which sets them to $U(x^*) - 2[U(x^* + y) - U(x^*)]$. To make this concrete, consider the example of the four-year noncompete in a jurisdiction that allows noncompetes to be at most three years. Applying the first approach, the judge would rewrite the contract to two years and the offending company would receive whatever utility it got from this new, revised contract. Applying the second approach, the trier of fact would ask how much extra value the four-year contract was worth to the offending party over the maximum value of three years. The party would then be penalized twice this amount.

In the case of risk neutrality (or local risk neutrality in the zone of uncertainty), these two expressions converge and there is no choice to be made. And indeed, this may often be true in the cases where we wish to apply reflection. If the range of uncertainty is tight or the

example, consider once again the case of our fruit seller who may not charge more than $10 for her wares. Under reflection, if she charges $12, then she is awarded only $8. And if she violates the rule more egregiously by charging $18, then she is forced to accept an even smaller price of $2.[84]

FIGURE 2.
SPECTRUM OF REMEDIES



As with general strong and weak penalties, the reflective remedy also applies to behavior that cannot be expressed in monetary terms. Unlike supercompensatory damages, where a multiplier can only be applied to monetary damages, the reflective remedy can also apply to the reformation of certain general contract terms that can be only approximately quantified. Consider the example of the noncompete clause above where the number of contractually specified years can be reflected over the socially optimal number to implement reflection of the contract term. In this way, then, reflection can also be applied to equitable remedies.[85]

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regulated party is an institution that is looking to maximize profit (e.g., in the case of noncompetes), then risk-neutrality may be a plausible assumption. *See infra* Appendix A (modeling concretely the difference between the two approaches).

84. This is the connection to disgorgement. Classically, there are four bases for damages that focus on either the plaintiff or the defendant. Reliance damages and expectation damages focus on the plaintiff, while restitution and disgorgement focus on the defendant. COOTER & ULEN, *supra* note 43, at 311. Disgorgement is a counterpart to expectation damages. Where expectation damages place the plaintiff in the ex post position by making her indifferent between the contract being performed or not, disgorgement places the defendant in the ex post position so that "[w]hen disgorgement is perfect, the injurer is indifferent between doing right, on one hand, or doing wrong and paying disgorgement damages, on the other hand." COOTER & ULEN, *supra* note 43, at 320; *see also* Melvin A. Eisenberg, *The Disgorgement Interest in Contract Law*, 105 MICH. L. REV. 559, 561 (2006) ("The disgorgement interest is the mirror image of the expectation interest.").

85. Additionally, because reflection is focused on disgorgement rather than expectation, reliance, or restitution, reflection fundamentally differs from double damages (though the two may overlap under certain circumstances). *See* COOTER & ULEN, *supra* note 43, at 309-11, 318-20

B. The Impact of Reflection

Reflection better induces optimal deterrence under uncertainty as compared to the traditional remedies discussed in Part I. It does so by incentivizing parties to choose the midpoint of their perceived range of optimal behavior.[86] That is, if the fruit seller thinks that the optimal price lies somewhere between $8 and $12, she will choose the middle of this range: $10. Within the Craswell and Calfee model, this corresponds to the point where $P(x) = 0.5$, the point where the probability of legal sanction is fifty percent.[87] While the mathematical details behind these conclusions are reserved for the Appendix, the intuition behind this result is fairly straightforward. The symmetry of reflection, which offers a punishment that scales with the level of overreach, creates incentives that are symmetric as well, driving the choice of the middle point. What matters is the relative positioning of the socially optimal point compared to the chosen action.

Therefore, where the middle of the distribution is fairly close to the socially optimal point, reflection is a strong choice. Reflection thus does not require perfection to improve upon existing remedies. For example, consider the employer who thinks that the maximum length of a noncompete in its jurisdiction is somewhere between two years and four years, with any point on that spectrum equally likely. If the true maximum is three years then the employer is right *on average* in the sense that its views are centered on the correct answer to the question. In this case, reflection has the power to induce optimal compliance.[88] In the above example, even if the employer's range is slightly askew, reflection's incentive to choose the center point may still improve upon the outcomes of other remedies. Reflection only requires that the agent's views be "good enough" to be effective. It is unlikely that parties will always have the precise symmetry that reflection requires for perfect results. But if they have a general idea about the contours of

(discussing the different categories of remedies from a law-and-economics perspective). This distinction is explored further *infra* Section II.D.

86. *See infra* Appendix A (modeling the impact of reflection for risk-neutral and risk-averse individuals and demonstrating this property).

87. It is important to recognize one wrinkle in this analysis. Just as in the Craswell and Calfee model, reflection relies on the idea that at this midpoint, the actual "maximal" value of the law is in the range in question. $P(x)$ cannot be read as a probability of enforcement absent a dependency on what the law actually is. For example, if the individual is choosing between a two-year noncompete and a four-year noncompete but knows that the maximum allowable length is one year, then the reflection analysis will not hold. The Craswell and Calfee analysis of the weak penalty also will not hold. In this situation, the individual in question may willingly choose to limit his or her behavior to avoid detection. Reflection relies on the idea that the law itself is unclear, not just that detection is uncertain.

88. *See infra* Part III for further discussion of when reflection should be applied.

the law, they may still end up relatively close to the socially optimal behavior under a system of reflection.

Reflection is also often an improvement over the other penalties discussed earlier. Craswell and Calfee observe that strong penalties have significant flaws when enforcement uncertainty is present. Strong penalties will lead defendants to overcomply with the law depending on the size of the uncertainty.[89] This dynamic is not present in the case of reflection. Reflection is unaffected by the "amount" of uncertainty.[90] Whether the standard deviation is large or small, the defendant will always choose the middle of the distribution. Therefore, in cases where individuals have beliefs that are centered around the socially optimal legal rule, reflection will frequently improve ex ante outcomes.

Reflective remedies are an improvement over weak penalties as well. Because weak penalties only penalize defendants by the amount of their overreach, they provide no incentive to moderate.[91] Hybrid penalties offer somewhat of an improvement but similarly are no panacea.[92] Reflection corrects for this problem by making the simple adjustment of doubling the weak penalty. By doing so, overreaches are now punished in proportion to their size. Changing the penalty in this way encourages individuals to choose their best guess of what the law is,[93] knowing that small overreaches will be punished, but that punishment will be proportional. The point is not that these small excesses are necessarily desirable but that allowing them to occur enables parties to seek out the social optimum. If small excesses are harshly punished, the rational reaction is for parties to steer away from the risk of engaging in a small overreach. If these overreaches are punished too mildly, the opposite will occur. The key then, if we wish for parties to look for the social optimum, is to calibrate the remedy so that the incentives are just right.

C. Reflection of Multiterm Contracts

Some contracts may have multiple, interacting terms that we care about. For example, a noncompete that prohibits working in New York State for two years may be deemed illegal while a two-year noncompete covering New York City or

89. Though they note that it is possible that undercompliance will result, this outcome is less likely. Craswell & Calfee, *supra* note 6, at 282-83. In the case of risk aversion, overcompliance is more likely. *Id.* at 301.

90. *See infra* Appendix A.

91. *Id.*

92. *See supra* Section I.B.2.

93. In the sense that the average corresponds to the expected value of where the social optimum is.

a one-year noncompete covering New York State might not be.[94] In these cases, reflection cannot be applied in a straightforward manner, because the *interaction* of two (or more) separate elements is causing the harm. However, even in such cases reflection can nonetheless be a workable solution.[95]

One solution is to use monetary damages to reflect the defendant. Although this is not the typical solution found in the law, courts could first calculate the loss incurred by the plaintiff and then enforce the contract and also ask the defendant to compensate the plaintiff for the overreach. This approach would essentially have a court make a judgment about the economic injury faced by the plaintiff.

Another solution focuses on cases in which reflection is used to rewrite a contract rather than to award damages. A court could reflect a multiterm contract by asking, for each term, what the maximum allowable value would be while holding each of the other terms constant. Concretely, consider the following example involving the same two-year contract that covers New York State.

> *Q*: What is the maximum geography that would be "reasonable" when combined with a two-year contract?
> *A*: A two-year noncompete that covers only New York City.
> *Q*: What is the maximum length that would be "reasonable" when combined with a noncompete covering all of New York State?
> *A*: A noncompete lasting one year.
> *Outcome*: The contract is modified to a one-year contract covering New York City.

This second solution differs from a *perfect* reflection because it is not actually a double-disgorgement remedy.[96] That is, it does not actually look to the gain of the defendant and then double that amount. Instead, depending on the relationship between the two factors, this approach may end up penalizing the defendant by more *or* less than double. However, reflection applied in this way offers a middle ground between a strong and weak penalty and therefore can still achieve

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94. Indeed, consideration of multiple terms is often a standard part of noncompete cases. *See, e.g.*, Estee Lauder Cos. v. Batra, 430 F. Supp. 2d 158, 177-82 (S.D.N.Y. 2006) ("In determining whether a covenant not to compete is reasonable in time and geographic scope, enforcement will only be granted to the extent necessary to protect the employer's legitimate interests . . . .").

95. I more fully discuss the potential solutions to this problem as well as some of their shortfalls in Appendix B.

96. *See infra* Appendix B (discussing the difficulty of implementing reflection perfectly in this way).

some of the benefits of reflection. Thus, it still may present an improvement over strong and weak penalties in some cases.[97]

D. Comparing Reflection

While reflection can resemble traditional remedies, it deserves independent status because it differs from traditional alternatives in unique and important ways. For one, reflection differs from strong and weak penalties in that it encourages individuals to choose the point where the probability of sanction is fifty percent. It therefore exhibits the unique ability to create optimal ex ante incentives in situations where individuals have views that are accurate *on average*. In those situations, reflection encourages individuals to pick the optimal level of behavior rather than overcomplying, as in the case of strong penalties, or undercomplying, as in the case of weak or hybrid penalties. This means that if policymakers can ensure that individual beliefs are centered around the correct result, then reflection will induce compliance with the policy. This is a feature that none of the previously considered remedies along the strong and weak spectrum have.

Moreover, reflection differs from the familiar remedy of supercompensatory damages—in particular, double damages—in three key ways. First, reflection differs from (most) implementations of double damages because it is a disgorgement remedy. As Justice Rehnquist noted in *Smith v. Wade*, the usual function of the law is to compensate the plaintiff for some injury suffered.[98] Disgorgement is defendant-centric rather than plaintiff-centric because it is not tied to the harm the plaintiff suffers. Rather, it looks only at the defendant and the benefit she obtains from the (wrongful) action. In contrast, multiple damages are traditionally based on the harm to the plaintiff.[99]

Second, reflection is less punitive (in most cases) than the strong remedy that forces the defendant to pay the full social cost of the wrongful action. This is a distinction from previous descriptions of multiple damages, which typically advocate for penalties that are *stronger*. For example, in their discussion of damage multipliers, Craswell and Calfee consider multiples of the full social cost in their analysis as a way to compensate for the fact that strong penalties may be an

97. Comparison to hybrid penalties is a little more complex. Essentially, hybrid penalties have the same defects as weak penalties do when parties are acting reasonably. They do avoid the problem of wild overreaches. In most cases, however, because parties will be subjected to the weak penalty in the ranges we care about—the area around the social optimum—hybrid penalties will function similarly to weak ones.

98. 461 U.S. 30, 57 (1983) (Rehnquist, J., dissenting).

99. *See* Michael Rustad & Thomas Koenig, *The Historical Continuity of Punitive Damages Awards: Reforming the Tort Reformers*, 42 AM. U. L. REV. 1269, 1284-86 (1993).

insufficient deterrent.[100] Here, by contrast, the defendant who violates the rule or standard can get more than nothing and need not pay the full social cost of her action[101] or some multiple of that value. Rather, under reflection the defendant will typically still be left with some private gain, even after application of the penalty.

Third, reflection can be applied to nonmonetary sanctions as well. Even in cases where the traditional rationale for double damages applies and disgorgement overlaps with another basis for damages, reflection extends this principle to new situations and fact patterns. Reflection, unlike double damages, can be applied to reform the underlying contract in an equitable fashion. This feature of the remedy increases the applicability of this proposal and further distinguishes it from traditional supercompensatory damages.

In sum, these unique properties of reflection justify its status as an independent tool on the remedies spectrum, separate from weak, strong, and hybrid penalties as well as from traditional supercompensatory damages.

III. WHEN AND WHERE SHOULD REFLECTION BE APPLIED

In Part II, I explained how reflection works and what its advantages can be. But I do not mean to suggest that reflection should be applied in every setting. Whether reflection is appropriate will depend on the rule or standard at issue as well as the exact contours of the legal problem reflection is trying to solve. Two inquiries are necessary for determining where reflection should apply. First, certain threshold questions must be answered to determine whether a given legal problem is suitable for reflection. Not all legal problems involving uncertainty are suitable. Second, even if a legal problem meets these threshold conditions, efficiency considerations may counsel against the application of reflection. For example, transaction costs might make it inefficient to apply reflection in a particular case.

Section III.A analyzes the general shape of the problems that reflection aims to address, arguing that reflection is best suited to regulate the *content* of agreements, rather than to remedy *breaches*. Section III.A also addresses how judges should identify potential disputes that are well-suited to reflection. Section III.B then discusses reflection in light of other considerations of justice and addresses why these considerations might both further justify the use of reflection in some areas and caution against it in others. Finally, Section III.C details additional criteria to determine which category of problems reflection is best suited to address.

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100. Craswell & Calfee, *supra* note 6, at 292-95.

101. The full social cost of the action is assumed to be larger than the private benefit for violating the rule or standard because this is the definition of the socially optimal point.

A. Where Reflection Applies

The first inquiry concerns the classes of disputes that are most suitable for reflective remedies. Reflection is a contractual remedy. But this description still leaves three important questions. First, should it be applied to the terms of contracts or to breaches of those terms? Second, when is ex ante compliance actually desired? And finally, which sorts of disputes have the relevant "uncertainty" that reflection addresses?

First, reflection should only apply to the terms of contracts, not to breach. Breach is often deliberate (and possibly efficient), not a function of uncertainty.[102] As such, the analysis in Part II does not apply to breach. More importantly, reflective remedies are inconsistent with our well-developed expectation-damages regime, whose objective is to make the breached party whole. Here, deterrence is beside the point because, regardless of what the breaching party does, the party who receives the damages is made whole for the value of the contract. Worse, reflection could *undermine* the expectation-damages regime, because as the theory of efficient breach shows, we often do not want individuals to be deterred from breaching.[103] Thus, implementing a remedy that encourages precise compliance may result in social-welfare loss.

The utility of applying reflection to the terms themselves is that it can limit the drafting of terms that are socially harmful. It can promote ex ante compliance with the law, limiting both the harm of those terms and the ex post need to litigate their fairness. The issue is not one of efficient breach because we have assumed that the terms themselves are inefficient when they violate the law.

Second, reflection is only valuable when precise compliance is actually desired. As noted earlier, there will be some cases in which we wish to overdeter behavior that toes the line of acceptability. For example, while there are outer edges of what is acceptable in antidiscrimination law, we may rightfully wish that the law overdeters such borderline behavior, even while we accept its legality for practical reasons. Similarly, while the potential for aggressive tax lawyering may be the inevitable result of a complex set of tax rules, the IRS might rightly wish to deter parties from trying to find the boundaries of what is acceptable. In both cases, reflection will be inappropriate to deal with the problem of ensuring optimal behavior.

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102. *See* Richard Craswell, *Contract Remedies, Renegotiation, and the Theory of Efficient Breach*, 61 S. CAL. L. REV. 629, 630 (1988).

103. *See* Eisenberg, *supra* note 20, at 977-78 (describing the theory of efficient breach as "hold[ing] that if a promisor would gain more from breaching the contract, even after payment of expectation damages, than the promisee would lose, breach is efficient and for that reason should be encouraged").

Finally, there is the question of how to identify where the relevant "uncertainty" actually exists. While it is fairly easy to model an uncertain rule in the context of mathematical formalism, it may be hard to spot these situations in practice. For example, in the case of overly restrictive noncompetes, uncertainty about enforcement may result from a variety of sources. In some cases, economic circumstances may limit the ability of plaintiffs to challenge burdensome contracts. In other cases, potential plaintiffs may not object to the particular term. Moreover, judges may apply the rules differently depending on their approach to the law or their bias towards one party or another. Reflection should only be applied when the law is genuinely uncertain in its application and not when enforcement is uncertain because background conditions limit the ability of individuals to challenge clearly unlawful acts.

B. Reflection and Justice

While this Note's methodological approach is firmly grounded in the law-and-economics tradition, it is also important to relate reflective remedies to other considerations of justice. In some cases, we may wish to limit the application of reflection based on those considerations. But often, reflective remedies will align with other considerations of justice rather than push against them.

For example, imagine that we live in a jurisdiction in which all prices must be "reasonable" and what is "reasonable" will vary with context. Further, imagine that *A* exceeds the level of reasonableness slightly in a way that harms *B*. What result best serves the aims of justice? One view is that *B* should only have to pay what is "reasonable" and therefore *A* should supply a refund.[104] Alternatively, we could punish *A* by requiring *A* to surrender both the entire purchase price and the goods in question to *B* through use of the strong penalty.

However, intuitively, both of these results seem somewhat troubling in the situation in which *A*'s overreach is the result of uncertainty about the law. The strong penalty seems overly punitive because *A*'s breach of the law is both slight and the result of an effort to comply with the law in good faith. At the same time, the weak penalty performs poorly in respecting *B*'s rights. Because it gives no incentive for *A* to accurately estimate the law, it foists upon *B* the burden of both determining whether a violation of rights has occurred and pursuing a legal remedy. The weak penalty does not just encourage overreach; it puts all the burdens of overreach on the harmed party.

Reflection offers a middle course between these outcomes that resonates with common intuitions about justice. It is proportional to the wrongdoing of *A*

104. This is the view adopted by the Uniform Commercial Code. *See* U.C.C. § 2-302 (AM. LAW INST. & UNIF. LAW COMM'N 1977); *see also infra* Section III.B.3.

and therefore avoids the pitfalls of the strong penalty. However, it allows *B* to be compensated for the degree of overreach that *A* has engaged in. In doing so, it recognizes the harm that has occurred if *B* has been charged a price that is unlawful, even if *B* is later able to remedy the issue by resorting to the legal process.

Consider the concrete case of an employer who habitually writes overly strict noncompetes.[105] Even if the employer does not choose to enforce the full term of the agreements, the potential for enforcement could limit employee movement out of fear of litigation. Additionally, employees who do choose to leave and sue will, under a blue-pencil approach, receive only the maximum reasonable version of their agreement. While this result certainly aids the employee, it does nothing to deter the employer's actions nor does it provide any benefits to the employee for the costs imposed by the litigation risk experienced by someone who might worry that the contract will be fully enforced. While reflection does not harshly punish employers who make a good-faith effort to draft agreements, it also recognizes that increases in the restrictiveness of those agreements can have costs and provides an "award" to employees based on the degree of employer overreach.

Our judgment about whether reflection is just might change if people's uncertainty about the law arises from their divergent socioeconomic conditions. But concerns about relative disadvantage are unlikely to alter my conclusions in most cases for two reasons.

First, what matters for the application of reflection is that the party making the decision in question has beliefs that are centered on the correct value. Where socioeconomic conditions make this difficult—or where they mean that the assumptions regarding risk aversion do not hold[106]—reflection will be inappropriate. However, where relative levels of education give rise to a divergence of perceived outcomes, then reflection may remain appropriate. For example, if more education means that some individuals will perceive the maximum length of a noncompete as lying between ten and fourteen months while less informed peers perceive it as lying between eight and sixteen months, reflection will still have the same result.

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105. *Cf.* Estee Lauder Cos. v. Batra, 430 F. Supp. 2d 158, 181-82 (S.D.N.Y. 2006) (limiting the application of a twelve-month noncompete because of the company's practice of not enforcing the full term against similar employees).

106. *See infra* Appendix A. This is most likely to be where the assumptions of this Note break down: when applying reflection to the actions of lower socioeconomic status. Individuals who face relatively fewer resource constraints at the margin are likely those who will most resemble risk-neutral actors like corporations. Individuals who face more significant resource constraints, in contrast, are likely to value incremental dollars differently as they devote them to different needs.

True, the mathematical analysis supporting reflection is less likely to justify the application of reflection to individuals who are less sophisticated about the law. The assumptions about risk neutrality and beliefs that are right "on average" about the law are less likely to hold in these circumstances. But the cases in which reflection may be most appropriate will often be those in which well-resourced parties may be tempted to take advantage of less-advantaged peers.[107] In these situations—for example, in the case of contracts of adhesion—society is likely to value ex ante compliance with the law as a way to limit the need for disadvantaged individuals to bear the cost of legal processes to vindicate their rights. Therefore, while differing levels of education are a theoretical concern, they are unlikely to be an issue in the cases in which the other conditions for applying reflection hold.

The second reason that concerns about relative socioeconomic disadvantage are unlikely to alter my conclusions is the following. Someone might object that reflection can penalize individuals of lower socioeconomic status when the beneficiary of reflection is well resourced and that this seems unjust. Such situations, however, are unlikely to occur. For them to occur, one would have to believe that the less resourced party would be able to convince the more resourced party to enter into a contract that violated the law in a way that harmed the more resourced individual. While this is certainly possible, it seems unlikely that disadvantaged parties are routinely inducing well-heeled counterparties to enter illegal contracts in this way. Instead, reflection will more likely regulate less resourced individuals when the counterparties to these contracts *themselves* have few resources.

In addition to relative socioeconomic disadvantage, two other scenarios are worth considering in which reflection might risk unjust results. The first scenario involves two unsophisticated parties who accidentally enter into an overly restrictive noncompete. Reflection may be inappropriate in such cases. Instead, it may be more just to remedy such a violation of the law by rewriting the parties' contract to the one they intended to make. However, an opportunity to rewrite the contract in these ways is unlikely to arise because one of the parties would first need to challenge the legality of the contractual terms.[108]

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107. For example, the applications to price unconscionability, noncompetes, and housing all have this characteristic. *See infra* Part IV.

108. Empirical evidence suggests that less sophisticated parties may feel bound by these terms even though the law would provide them some remedy. *See* Meirav Furth-Matzkin & Roseanna Sommers, *Consumer Psychology and the Problem of Fine Print Fraud*, 72 STAN. L. REV. (forthcoming 2020) (finding that less sophisticated parties tend to assume that all contracts are binding). This situation is also complicated by the fact that unsophisticated parties are unlikely to know the relevant remedy that will be applied and therefore do not bargain in the shadow of the potential penalty.

The second scenario involves two sophisticated parties who might attempt to use reflection strategically. Such parties might contract for a deliberately onerous term and then sue each other in order to gain a reflective remedy. Reflection would allow one of the parties to limit the effect of the onerous term while pocketing the gains from the transaction.[109] Such transactions, however, are unlikely because they would require burdensome litigation.[110] Moreover, reflection could and should be limited in its application to avoid such transactions. For instance, one response to attempts by sophisticated parties to strategically game reflection to achieve unjust results might be to apply the reflection to the plaintiff instead. If the plaintiff, say, claims that a 2-year noncompete is unlawful and asks the court to modify the agreement to 1.5 years, a court could, if it finds that the plaintiff has been overly aggressive, reflect the plaintiff instead. Thus, if the court determines that a 2-year agreement is permissible, then it could reflect the plaintiff by reflecting the request of 1.5 years over the initial agreement and creating a 2.5-year agreement.[111]

In sum, there are not only economic but also justice-based reasons to favor reflection in certain circumstances. In some cases, reflection will better harmonize our desire to balance the need to punish defendants while not overly burdening plaintiffs. It may also help ensure that good-faith defendants receive relatively lenient punishments, while those who look to stretch the boundaries of

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109. For example, one can imagine an executive attempting to accept higher compensation in exchange for an onerous noncompete. The executive could then later attempt to gain the benefits of reflection while collecting the increased compensation.

110. In particular, one must imagine a case in which the sophisticated party is bargaining with an unsophisticated party for a term that is purportedly to the advantage of the unsophisticated party, but the less sophisticated party is offering sufficient compensation to make such a transaction worthwhile. While a sophisticated employee might attempt to trick an unsophisticated employer in this way, one would have to imagine the unlikely situation in which the rewards of such an action would outweigh the costs. While possible, I believe that such situations are unlikely to occur, though cases in which individuals attempt to deceive less sophisticated parties to achieve unconscionable results certainly exist. *See* Harry v. Kreutziger, [1978] 9 B.C.L.R. 166 (Can. B.C. C.A.) (holding a bargain in which the defendant took advantage of the plaintiff's lack of education to be unconscionable).

111. Note that this solution rests on less certain mathematical grounds than typical applications of reflection because it introduces an additional uncertainty — whether the judge will apply plaintiff reflection — that complicates the situation.

An even harder question arises if the court decides that some intermediate result is correct. For example, what if the court decides that 1.5 is too aggressive, but a 1.8-year noncompete would have been permissible? One solution is just to apply reflection as usual. Another is to apply the bargaining version of reflection discussed later to punish the plaintiff for overreach. *See infra* Section IV.B. A final solution would be to discretionarily apply a weak penalty. Application of the bargaining version here is imperfect because the defendant is, in theory, defending an agreement that both parties chose, rather than choosing their own preferred value.

what the law allows face harsher sanctions. Cases in which considerations of justice counsel against the application of reflection even when other factors push in its favor do exist but are rare.

C. Efficiency Conditions for Optimality

Even once the threshold questions above have been addressed, the decision whether to apply reflection to enforce a given policy will depend on its impact on the costs and benefits of the rule or standard in question. While the conditions discussed earlier concern noneconomic reasons not to apply reflection, economic considerations may also counsel against its adoption in certain cases. In particular, reflection should typically only be applied when three conditions hold: first, uncertainty arises from application of the law, not from enforcement; second, there is unlikely to be "chipping away" at the law through repeated litigation; and third, reflection can be computed by the trier of fact.

With respect to the first point, the uncertainty in question must come from the application of the law rather than from enforcement for the results above to hold. Indeed, the arguments for reflection will fail if the uncertainty in question derives from the difficulty of detection rather than the difficulty of determining what the law is. If the zone of enforcement is detached from the zone of uncertainty about the law's application, then the mathematical justifications supporting reflection will not apply.[112]

If the relevant uncertainty exists, the policy-maker must still consider the cost and benefits of adopting reflection. In the helpful framework provided by Louis Kaplow, there are three areas to consider when choosing the form of the law: promulgation costs, costs of agent behavior, and enforcement costs.[113] Promulgation costs refer to the costs of actually writing the law. For example, it might be cheaper to write that all restrictions on future employment must be "reasonable" than to attempt to formulate more detailed rules. The costs of agent behavior are the costs and benefits of the actions that individuals take under the regulation. Finally, there are costs to enforcement, which include the costs of both government enforcement and private litigation. Among these three costs,

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112. For example, if we suppose that the maximum length of a noncompete is one year, but for economic reasons there will be no enforcement against any noncompete under two years, then regulated parties will choose at least two years regardless of reflection. In such cases, the choice of penalty might instead reduce to a question of what sort of sanction will encourage enforcement.

113. Kaplow, *supra* note 8, at 568-70. Kaplow, of course, is focused on the choice between rules and standards, but his analysis can be applied here when considering the effect of the penalty on the standard chosen.

we can often evaluate the efficiency of a policy, though not necessarily its distributive justice. They also provide a helpful framework in which to consider the choice of remedies for breaches of those policies.

First, promulgation costs are not likely to differ significantly between strong and weak penalties. There may be some impact if the policy-maker decides to construct a more complex penalty (for example, a complex schedule of fines for different behaviors), but the simple choice of the remedy is not likely to significantly impact promulgation costs.

Second, the choice of penalty may have an impact on the behavior of individuals and therefore the costs of their choices. This impact has mostly been discussed above in terms of whether individuals over- or undercomply with the rule or standard. That analysis, however, was static. In reality, precedent further develops the law and increases certainty over time. Therefore, the final rule that emerges through the formation of precedent must also be considered in any long-run analysis of the impact of the penalty on the efficiency of the rule or standard.[114] In these circumstances, remedies that encourage litigation may actually enhance the efficiency of the rule or standard beyond the direct impact on behavior.

Finally, the penalty may have an impact on enforcement costs. First, the choice of penalty determines the difficulty of calculating it. As Isaac Ehrlich and Richard A. Posner note, more issues to litigate mean a higher cost of enforcement.[115] Complex penalties that require the trier of fact to answer multiple factual questions may therefore impose significant costs on the legal system. In particular, penalties that require the policy-maker (or judicial decision-maker) to make precise estimates of a complex social-cost function may be particularly costly. Second, while litigation can have desirable impacts, it can also be incredibly costly. Minor changes in the behavior of individuals due to the development of case law have to be weighed against the social cost of litigation.

Depending on the factual circumstances, reflection may meaningfully affect each of these costs, and the impact will determine whether reflection should be applied. Therefore, the remainder of this Section is dedicated to analyzing the impact of reflection and determining the conditions under which it should be applied to legal problems.

The penalty's main impact will be how it affects the behavior of individuals who are attempting to comply with (or strategically disobey) the rule or standard. As discussed above, this change in behavior has two components: the static

114. *See* Owen M. Fiss, *Against Settlement*, 93 YALE L.J. 1073, 1085 (1984) ("[C]ourts are reactive institutions. They do not search out interpretive occasions . . . . A settlement will thereby deprive a court of the occasion, and perhaps even the ability, to render an interpretation.").

115. Ehrlich & Posner, *supra* note 8, at 265-66.

and the dynamic effects. Depending on the circumstances, both of these may influence the overall efficiency of the rule or standard.

In the static context, reflection works well when the enforcement probability distribution is "symmetric" around the socially optimal value. Because reflection forces the (risk-neutral) defendant to choose the point where the total probability of punishment is fifty percent,[116] it is a poor fit for situations in which the probability that a plaintiff will attempt to enforce the rule or standard is low. Indeed, as noted above, reflection relies on the notion that the probability of sanction is fifty percent because *the law itself is unclear*.[117]

Reflection also relies on the near certainty that at least one individual will challenge the overreach. Situations where the costs of a legal action are high relative to the expected benefits or where detection of wrongdoing is difficult are not likely to fall into this category. In contrast, in situations where monitoring is relatively easy and the primary dispute has concluded, the application of the rule or standard is likely to be more favorable to reflection. Recall that the probability of detection referred to here is the aggregate probability rather than the probability in each individual instance. If the behavior is iterated over a large number of identical situations, the chance of detection may be quite high even though the chance is low for each individual case. For example, some situations in consumer contract law are likely to be favorable ground for the application of reflection because a large number of parties have access to the agreement, and therefore it is likely that one will identify a potential breach that has occurred.

With respect to the dynamic effects on behavior, reflection is likely to perform well where the social benefit of an efficient final rule over time is relatively high. Because reflection can encourage repeated litigation that "chips away" at the rule or standard, it can potentially lead to high enforcement costs. These costs are only likely to make sense when the efficiency benefits of a socially optimal steady-state rule are relatively high. At a high level, this benefit can be expressed as *efficiency gain* × *number of applications*. When either the benefit of the small improvement is high, or the situation is likely to be repeated over and over again, the dynamic impacts of reflection are likely to be socially desirable. Of course, application requires a legal situation where precedent is cumulative in this way. Many legal questions turn on the application of the law to a new set of facts rather than the repeated development of the law as applied to the same factual scenario. In the case of applying the law to a new set of facts, both the harm and the benefits of "chipping away" are likely to be small because there is no relevant situation to chip away at. However, in the case of repeatedly applying the law to the same facts—for example, the question of what the limits are for

116. *See supra* Section II.B.

117. *See supra* note 87.

noncompetes for finance executives in New York City—the benefits and cost of this dynamic effect must be considered.

Reflection also affects the costs of applying the penalty. Application costs, once a violation is found, are not always trivial. While voiding an agreement is easy to apply, the computations that reflection requires may be complicated. In particular, reflection requires the trier of fact to determine what a "reasonable" agreement or action would have been and then use that determination to implement reflection. In some circumstances, this determination is likely to be somewhat complicated.[118] If determination of the reasonable point is difficult, then reflection is likely to perform poorly when compared to a strong penalty that voids the agreement or imposes a traditional damages remedy. It may be true that the law, even once precedent and other tools of legal reasoning are considered, still precludes identification of a precise point of "reasonableness." Judges may be confined to a simpler form of common-law reasoning that can only compare cases one at a time, even if they can articulate some factors that guide their judgment. Reflection will therefore only function when there is a more robust consensus of how to draw more precise lines. Moreover, when the term in question is qualitative and does not easily lend itself to quantification,[119] reflection is likely to be difficult to implement.[120]

Therefore, reflection will be most easily applied in cases and for issues where the trier of fact (that is, the judge or jury) is already required to perform a task that looks relatively similar to the quantification that reflection requires. That is, when the judge or jury is dealing with amounts that are easily quantified—such as a number of years or an amount of money—it will be subsequently easier for the trier of fact to apply reflection to that amount.[121] For example, where a price

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118. On the other hand, one potential benefit of reflection could be that it requires the trier of fact to articulate this value. Even if these articulations are not binding on future courts, attempts to articulate the boundaries of "reasonableness" could have an information-forcing effect on judges that reduces uncertainty in general.

119. *See supra* notes 95-96 and accompanying text.

120. *See* discussion *infra* Appendix B (discussing the difficulty of reflecting a term representing geography and describing how this problem can be solved with second-best reflection where there are two or more terms to consider). For an example, of this dynamic, consider the case of a geographical restriction. It is not clear how to reflect a broad geographical restriction over a narrower one.

121. This is not to say that the computation of damages is frictionless or not subject to other issues. Rather, it is just to point out that in many cases the difficulty with calculating damages is already baked into the legal process and therefore reflection creates no extra burden. *Cf.* Louis Kaplow & Steven Shavell, *Accuracy in the Assessment of Damages*, 39 J.L. & ECON. 191, 201-04 (1996) (arguing that typically parties looking to prove damages will seek more accuracy than is required to provide optimal incentives for potential injurers to avoid committing torts).

is deemed unconscionable, the trier of fact only needs to determine what a reasonable price would have been to apply reflection.[122] In these cases, existing practice demonstrates that judges already have (and actually exercise) the ability to engage in the quantification necessary to implement reflection.[123]

As a result, reflection is likely to apply primarily in situations where: (1) the difference between the action the defendant actually took and the "reasonable" alternative lends itself to easy quantification (in concrete or utility terms); and (2) the quantification in (1) can be compared to the difference between other points when implementing the reflection. This is likely to be satisfied most often when the behavior involves an explicit quantification (for example, in time or dollars). Still, it is worth not overemphasizing this point. The judgment, as always, is comparative, not a question whether reflection performs perfectly. That inquiry may concede that judges will have some difficulties drawing precise lines but could still conclude that the process of performing a reflection is "good enough" to justify its error costs.

Despite its difficulties, reflection has several advantages over other penalties from a computational standpoint. First, reflection does not require the trier of fact to estimate social cost to impose the penalty. In cases where the social cost is diffuse, imposition of social cost as damages may be difficult or impossible.[124] In such cases, reflection presents a plausible alternative to imposing a strong penalty because reflection still deters overreach but simplifies decision-making.

Second, reflection can limit the cost of judicial error. If the remedy for a violation is to void the agreement or impose full social damages, an error by the trier of fact can be quite costly to a private party if the error is one that mistakenly designates legal behavior as illegal. In contrast, under reflection, small errors in estimation of x^* only lead to small changes in the penalty imposed on the defendant. Even if the trier of fact draws the line of reasonableness slightly incorrectly and declares the defendant's conduct unlawful, reflection ensures that the ensuing penalty will be minimal.

Aside from decreasing the uncertainty the individual faces (by limiting the potential for large swings in welfare), this second impact may also be desirable from a normative standpoint. If a goal of the legal system is to treat similarly

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122. *See infra* Section IV.C.

123. Another example can be found in jurisdictions in which judges rewrite noncompetes to be "reasonable." *See* sources cited *supra* note 67.

124. For example, consider a contract that is void for public policy as a restraint of trade. *See* RESTATEMENT (SECOND) OF CONTRACTS § 186 (AM. LAW INST. 1981). What is the social cost of having one fewer plumber in the town? *See generally* Lisa Heinzerling, *Regulatory Costs of Mythic Proportions*, 107 YALE L.J. 1981 (1998) (describing the sometimes-fraught process of evaluating social costs and benefits and deciding which costs and benefits to include or exclude).

situated parties similarly, then the fact that small errors in judicial decision-making can result in large swings in individual welfare should be troubling. By limiting the cost of these errors, reflection has a normative advantage in the situations where it can be applied even if it would lead to the same results as the imposition of a strong penalty.

Thus, reflection is best applied when several conditions hold. First, the enforcement uncertainty results primarily from the uncertainty of the application of the rule or standard to a specific set of facts rather than from the difficulty of monitoring. Second, there is unlikely to be "chipping away" at the rule or standard, in part because factual situations do not reoccur,[125] or because this behavior is outweighed by the increase in social utility that results from the development of precedent. Third, ex post, the trier of fact is able to reliably compute the socially optimal value (or something close to it) and apply reflection based on this value. This will likely occur most frequently in situations where the trier of fact already must (explicitly or implicitly) determine the "reasonable" value when evaluating whether certain behavior violates the rule or standard. When these conditions are satisfied, reflection may be superior to other potential penalties because it drives individuals to comply with the law and pursue more socially optimal behavior.

As this Part has shown and as Table 1 outlines, several factors must be evaluated when determining where reflection should apply. First, reflection is best applied to the formation of agreements, not to conduct within them. Second, the policy-maker must actually desire precise compliance, and there must actually be "uncertainty" in the sense that the party choosing the terms must actually be uncertain about what is allowed by the law, not just uncertain about whether the law will be enforced. Third, reflection must not offend other considerations of justice and should not be applied in a way that punishes individuals who struggle to become informed about the content of the law. Fourth and finally, reflection must be justified by the costs and benefits of applying it to the particular legal problem. In cases in which the costs of applying reflection are higher than the benefits from improved compliance, reflection will fail to improve outcomes overall. While these restrictions may seem to eliminate all space for reflection, they actually leave a fair amount of room for the proposed remedy to apply. The next Part, therefore, turns to canvassing some of these applications.

125. This will likely turn on how broad the range of situations is to which the standard must apply. In cases where the standard covers a diverse range of situations that vary along multiple degrees of freedom, such conversion is unlikely to occur.

TABLE 1.
SUMMARY OF CONDITIONS FOR REFLECTION

Type of Condition	Specific Conditions
Contractual	• Reflection should be applied to the terms of the contract, not to breaches of lawful terms.
Behavioral	• Reflection should be applied when policy-makers wish to encourage actors to seek out the maximum of what the law allows.
Justice	• Reflection should be applied to pairs of sophisticated parties when it will not generate significant strategic behavior. • Reflection should not be applied when it would be punitive to less informed parties.
Uncertainty	• Reflection should be limited to cases in which the uncertainty in the law arises from ambiguity about the law itself. • Reflection should not apply when there is a significant risk the law will not be enforced.
Economic	• Reflection should be applied when it is unlikely that it will generate wasteful litigation that aims to "chip away" at the law. • Reflection can be easily applied or, at the very least, is no more difficult to apply than existing remedies.

IV. POTENTIAL APPLICATIONS OF THE REFLECTIVE REMEDY

While the above description of where reflective remedies might apply is abstract, its main conclusion is that the potential space for application is actually fairly robust. While the constraint that the parties must be able to monitor each other may seem to dramatically limit the number of potential applications, this is not so. Rather, these circumstances are likely to occur across multiple areas of the law.

In particular, while the remainder of this Part details specific applications, there are two broad paradigm cases in which reflection will be a good fit as a contractual remedy. The first is cases in which the parties are operating in an area where the law is sensitive to particular factual circumstances, but the parties wish to contract for the maximum value allowed by law. This may be true of prices,

lengths of noncompetes, or the level of services provided to a consumer, assuming the number of contracts in question allows for effective monitoring.[126] While the frequency of these different cases will vary, even limiting the remedy to low-income housing and noncompetes will affect a large number of contracts.[127]

The second paradigmatic case, the application of reflection to bargaining, is arguably more important. As trials have disappeared, the emphasis on settlement has grown. While reflection is no substitute for negotiation, in situations in which a central adjudicator, such as an arbitrator, is ultimately called on to set a fair value, reflection can have an information-forcing effect that limits the range of potential values and potentially leads to increased compromise. Moreover, to the extent reflection is successful, traditional bargaining situations could be altered or adapted to allow for this application of the remedy.

Of course, I do not claim that reflection is some sort of remedial silver bullet—far from it. I only mean to claim that the range of potential applications is broader than might initially appear and that in some cases these applications concern relatively routine contract problems. The remainder of this Part is dedicated to fleshing out these specific applications in more detail. It also examines how the principles that justify reflection can be extended to more general policy problems where legislators (or other policy-makers) wish to create mandatory floors or caps.

A. Noncompete Clauses

One example that has been consistently presented throughout this Note is the potential application of reflection to noncompete agreements. As previously stated, most jurisdictions choose between weak and strong remedies when agreements are found to be unreasonable.[128] Why is reflection potentially applicable here? First, since noncompetes are often identical for a large number of workers, detection of overly burdensome agreements is likely. As a result, the remaining uncertainty is likely to come from ambiguities in the application of the multifactor balancing test.[129]

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126. As noted above, this will sometimes mean that there must be a large number of contracts for the remedy to be effective.

127. *See* Evan Starr et al., *Noncompetes in the U.S. Labor Force* 2 (Univ. of Mich. Law & Econ. Research Paper No. 18-013, 2019), https://ssrn.com/abstract=2625714 [https://perma.cc/72UP-F2J8] (finding that "38.1% of employees had signed a noncompete at some point in their lives, while 18.1% of those in the U.S. labor force (roughly 28 million) were working under one").

128. *See supra* Section I.B.1.

129. *Id.*

Second, noncompete law is an area where the efficiency value of encouraging individuals to choose contracts along the efficient frontier is likely high. Systematic undercompliance may harm workers and restrict economic activity, making a weak penalty nonideal, while the uncertainty introduced by a strong penalty may lead to overcompliance, harming the private interests of employers. Additionally, this is an area where, despite the uncertainty about the application of the legal standard, employers are likely to have roughly accurate beliefs about the types of agreements that will or will not be enforced. Reflection therefore is likely to be able to balance these two interests and encourage employers to choose agreements near the social optimum. Furthermore, the prevalence of noncompetes may mean that, even if there are increased litigation costs, there is a net efficiency gain from reflection.

Finally, the fact that most states consider multiple factors when evaluating the "reasonableness"[130] of noncompetes means that multiterm reflection can be applied to these agreements even though some of the factors are qualitative. Though it would not be clear how to reflect a single term outlining a particular geography (for example, how does one reflect New York State over New York City?), multiterm reflection can avoid this pitfall. Reflection can therefore be applied to these agreements even though they may initially seem less hospitable to a remedy that requires quantification.

B. Refereed Bargaining

Reflection may also improve outcomes in many bargaining situations in which a referee will decide the value of the thing being bargained for.[131] For example, consider a scenario in which a court must choose which party's valuation of a given good or service is most reasonable. If the court declares that it will reflect the average of the parties' proposals over the final amount, it will create an incentive for both parties to bid their actual valuations of the object in question. For example, if *A* bids $20, *B* bids $10, and the court determines that the

130. *Id.*

131. Indeed, principles that are similar to those found in reflection are already found in contracts to limit bargaining issues. For example, shotgun clauses in partnership agreements allow individuals who are offered buyouts by their partners an option to buy at the price that is offered. John Warrillow, *Ugly Downside of a Shotgun Business Partnership*, GLOBE & MAIL (Feb. 8, 2018), https://www.theglobeandmail.com/report-on-business/small-business/sb-money/ugly-downside-of-a-shotgun-business-partnership/article626688 [https://perma.cc/TCY9-ECM3]. While not a reflection in the traditional sense, the principles function similarly. The function of the clause is to prevent partners from lowballing each other by providing the other with the option to "reflect" an offer that is too good to pass up. This was a connection observed by my father, David Johnston, in a conversation on this topic.

actual value is $17, the court could "reflect" the average of their initial bids, $15, over the value of $17 and award $19. This awards *A* for being closer to the correct amount. Such a procedure encourages both parties to attempt to estimate the correct amount and, as a result, to give up their private information about what the object is worth, thereby likely narrowing the range of disagreement.

For a concrete example, consider the application of reflection to baseball salary arbitration.[132] In Major League Baseball, players who have accumulated between three and six years of "service time" are eligible for salary arbitration.[133] This means that they are free to negotiate with their team for a higher salary, and, if the parties are not able to agree on a number, the parties are able to go before an arbitration panel that will then determine the appropriate salary.[134]

By adopting the procedure above, arbitration committees could encourage teams and players to choose more reasonable initial estimates of the correct salary.[135] This not only forces both parties to actually articulate their real view of the correct salary, which eases the job of the arbitrator but also may reveal space for compromise that might have been hidden by prior grandstanding. Moreover, to the extent that reflection fails to eliminate the need for arbitration, its marginal effect of closing the gap between the parties' bids should still be considered a benefit. If there is less distance between the parties, both the costs of arbitration and the potential harms from error will be smaller, as the arbitrator will now be choosing between a narrower range.

However, while application to baseball may be a somewhat niche example, similar bargaining games are widespread in various social contexts. They occur when shareholders assert appraisal rights because they disagree with the merger price[136] or when parties disagree about damages.[137] These situations could also occur when individuals disagree with the government about the valuation of

132. I am indebted to Professor Ayres for suggesting this example.

133. *See Salary Arbitration*, FANGRAPHS (Mar. 21, 2012), https://www.fangraphs.com/library/business/mlb-salary-arbitration-rules [https://perma.cc/3Y5D-M9MU]. For a discussion of the results of arbitration in baseball, see Amy Farmer et al., *The Causes of Bargaining Failure: Evidence from Major League Baseball*, 47 J.L. & ECON. 543 (2004), which found that arbitration was typically triggered by aggressive offers from players, resulting in superior team performance.

134. *Salary Arbitration*, *supra* note 133.

135. One limitation of this solution is that one-dollar moves by either party toward the optimum (arbitrator-chosen) result in only a half dollar of gain. To remedy this, the reflection could be doubled, with every one dollar between the arbitrator-chosen amount and the average of the bids rewarded with two dollars.

136. *See, e.g.*, DEL. CODE ANN. tit. 8, § 262 (2019).

137. *Cf.* Csanyi v. Regis Corp., No. CV-03-1987-PHX-JAT, 2009 WL 500833 (D. Ariz. Feb. 27, 2009) (evaluating whether the evidence supported Plaintiff's claims for damages).

their homes or when parties challenge the value of their property in a takings case. By creating incentives to get as close as possible to what the parties think is the proper resolution, reflection encourages the parties to share information rather than strategically conceal it. In any case where the parties disagree about an amount in question, reflection can be applied to limit incentives for overreach and encourage compromise by forcing the parties to share their true expected outcome. This makes the job of the ultimate decision-maker easier and may eliminate the need for bargaining altogether if the parties are able to come together before a decision is required.

C. Price Unconscionability

As noted throughout this Note, another important application of reflection involves price unconscionability. Under the Uniform Commercial Code, courts have the option to either void or limit the application of unconscionable terms.[138] In cases where the parties cannot be restored to their ex ante positions, the remedy is ordinarily at least the reasonable value of performance.[139] However, this is a case where reflection could be applied as an alternative remedy. The trier of fact in unconscionability cases is already required to determine "reasonable" cost, and therefore calculating reflective damages would be relatively easy. Furthermore, compared to general reformation of the contract, reflection incentivizes the defendant to refrain from overreaching, an incentive that does not exist when the remedy is the award of a "reasonable" contract price. As a result, reflection may encourage more optimal behavior by defendants in these cases.

Price unconscionability also illustrates the general ability of reflection to act as a punishment for a violation of a mandatory rule—in this case, the maximum allowable price. The key is to focus on cases in which the defendant is able to earn excess profits at the expense of the plaintiff by violating the mandatory rule. Here, reflection can be applied by implementing double disgorgement of the misbegotten gains. For example, reflection could be applied to usurious interest rates. Here again it is critical to note that reflection addresses situations in which the law itself is uncertain rather than situations in which there is uncertainty around enforcement.[140] Where the issue is one of genuine uncertainty about the appropriate level of profit, reflection may be well tailored to deter overreach.

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138. U.C.C. § 2-302 (AM. LAW INST. & UNIF. LAW COMM'N 1977).

139. RESTATEMENT (SECOND) OF CONTRACTS § 208 cmt. g (AM. LAW INST. 1981).

140. *See supra* note 87.

D. The Implied Warranty of Habitability

The implied warranty of habitability is a particularly useful example both because of its ubiquity and because it is not a clearly "quantitative" rule.[141] The implied warranty was first recognized by the D.C. Circuit in 1970[142] and has since spread across the county.[143] However, there remain questions about the appropriate damages remedy for a breach of the warranty.[144] Here again, reflection could be used to attempt to induce optimal behavior in compliance with the mandatory rule. Instead of the "percentage reduction" formula, a court could apply a double-percentage reduction to implement reflection.[145] If this approach would better induce compliance with the implied warranty, then there could be a benefit to both renters and landlords. Landlords would be free to attempt to comply optimally with the warranty while lowering prices as much as possible to enable renting. At the same time, violations of the warranty would be deterred, preventing tenants from having to rent dwellings that do not meet the important minimum standard. This is a classic case in which we may wish to enforce a floor on the market but avoid having individuals over- or undercomply with the rule.

The broader observation is that even where the mandatory rule does not take the form of a limitation that is explicitly quantified, reflection can still be employed where the benefit to the violator can be quantified. Thus, in cases in which violators realized excess profits as a result of their actions, reflection can still be fruitfully applied by forcing a double disgorgement of these excess profits. Of course, this requires that courts be able to correctly quantify the excess profits realized by violators, a task that may be difficult at times. However, in many cases, market prices will suffice to quantify the value of the service that was not provided. Where market prices do not suffice, the trier of fact may be able to compare the benefits realized by the violator with the benefits obtained by similarly situated individuals. As with many measures of damages, such as expectation damages, there will likely be times where the amount of damages is

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141. I am indebted to Professor Ayres for pointing me towards this example and noting that reflection need not be confined to situations in which the rule in question takes the form of a cap or floor on action.

142. Javins v. First Nat'l Realty Corp., 428 F.2d 1071, 1077 (D.C. Cir. 1970).

143. MERRILL & SMITH, *supra* note 31, at 694-95.

144. *Id.* at 696-97.

145. *Id.* at 697 ("The other, 'percentage reduction' formula develops a ratio between (i) the difference between the value of the premises if in compliance with the [implied warranty of habitability (IWH)] and the value of the premises if not in compliance with the IWH over (ii) the value of the premises if in compliance with the IWH, and multiplies this ratio times the rent reserved, for the amount of the reduction (damages).").

a point of contention between the parties, and reflection will suffer from the usual issues that arise in these instances. Still, calculating the gains of one party at the expense of another is unlikely to be more difficult than the usual task courts are called to do when setting damages.

E. Reflection, Caps, Floors, and Noncontractual Policy

Reflection can also help give bite to policies that set out mandatory caps or floors on action. Here the law may wish to enforce the mandatory floor without punishing those who fail to meet the floor despite a good-faith belief that they do. Reflection provides a policy tool to balance these competing interests in ways that other policy tools cannot.

One of these alternative applications would be to use reflection to regulate plaintiffs rather than defendants. For example, consider a state that, as a matter of public policy, would like to encourage plaintiffs to only bring suits for monetary damages that are in excess of $5,000. If a plaintiff brings a suit that they think may be worth $5,000 but after the trial receives only $4,500, what should the state do to enforce the policy? One option would be to just move on. After all, the expense of trial has already been incurred. Another option would be to void the entire recovery; however, this strong penalty seems unjust given that the trial has already occurred and the plaintiff has won. Reflection offers a middle ground. Instead of receiving $4,500 or $0, the plaintiff could instead be given $4,000 (the floor of $5,000 reflected over the actual recovery). This approach might better enforce the state's policy by providing some incentive for plaintiffs not to exaggerate their claims while not being overly punitive.

In general, the above example could be expanded to cover other cases in which the law wishes to regulate plaintiffs. For example, the reflection approach could be applied to the damages pled by plaintiffs to encourage accurate pleadings.[146] This Note has focused on defendants because the paradigmatic examples of applications of reflection involve cases in which a plaintiff wishes to limit the application of an overly strict contract that benefits the defendant. However, in cases in which the law wishes to regulate plaintiff behavior, possibly by limiting

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146. Such a rule would be operationalized by penalizing the plaintiff if the damages awarded at trial were less than the initial pleading by reflecting the pleading over the final amount of the award. For example, a plaintiff claiming damages of twenty thousand dollars who receives fifteen thousand at trial would receive a final award of ten thousand. This rule could be justified on the grounds that the plaintiff would have an incentive to actually disclose information and accurately estimate the damages she feels she has suffered. Courts and defendants would then know that the plaintiff is very confident that she will be able to justify that number, which may facilitate settlement and limit posturing. Of course, such an approach may punish less sophisticated litigants and should potentially be avoided for this reason. *See supra* Section III.B.

which suits should be brought, reflection may be an attractive option. Indeed, the English rule for attorney's fees can be thought of as a type of reflective penalty that is applied to plaintiffs.

It is worth noting that as applied to plaintiffs, the mathematical properties of reflection discussed earlier will not apply in the same way. Unlike defendants who wish to achieve the maximum gain without having the law enforced against them, plaintiffs are attempting to maximize their gain in most cases. While a plaintiff may wish to plead higher potential damages to obtain the benefits of diversity jurisdiction[147] or plead lower potential damages to avoid the application of the Class Action Fairness Act,[148] the plaintiff would certainly not mind if she received an award that is greater than this value. More importantly, even where society wishes to place a cap or floor that limits the ability of plaintiffs to bring cases, it is the result of the case that is uncertain, not the cap or floor.[149] As such, the results described earlier do not apply.[150] However, this does not mean that reflection is useless in such instances. The fact that it scales with the level of the transgression while still providing some incentive to comply with the mandatory rule may make it more attractive than no penalty at all.

Alternatively, assume the state wishes to limit the profit margin that landlords can make from certain classes of tenants to ten percent. A strong remedy might overdeter landlords from pursuing profitability, as a profit of eleven percent would then be reduced to zero. However, a weak penalty would create incentives to seek excess profits, secure in the knowledge that, at worst, the landlord will be rewarded with the maximum of ten percent. This example similarly provides a potential application for reflection as a tool to deter overreach that would not overly penalize either party.

While the above examples are stylized, they illustrate the potential benefits of applying reflection as a policy tool where a strong remedy is undesirable but a weak remedy encourages overreach. Reflection solves the issue by providing a way to enforce the policy cap or floor without allowing it to deter parties acting in good faith who slightly misestimate the actual value of their action. Where the state wishes to allow behavior up to a point, but no further, reflection can be

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147. 28 U.S.C. § 1332(a) (2018) (requiring, in addition to other conditions, that the "matter in controversy exceeds the sum or value of $75,000, exclusive of interest and costs" for the federal courts to have diversity jurisdiction).

148. *Id.* § 1332(d)(2) (giving district courts "original jurisdiction of any civil action in which the matter in controversy exceeds the sum or value of $5,000,000" and which satisfies certain other conditions).

149. Reflection would not be applied to a damages cap. It would be absurd to penalize a plaintiff because she suffered *too much* and therefore received an outsize award of damages.

150. *See supra* Part II; *see also infra* Appendix A (describing a model of the impact of reflection).

used to strike a policy balance of which other remedies are incapable.[151] Furthermore, where the trier of fact is already forced to articulate a "reasonable" value that is easily monetized or quantified, application of reflective remedies is straightforward and simple. In cases that have these general contours, reflection may better align incentives and encourage compliance with the rule or standard.

CONCLUSION

As this Note has shown, reflective remedies have several desirable features. Where individuals have accurate beliefs about what the law generally requires, reflection encourages optimal behavior by scaling penalties with overreach. It can discourage undercompliance while also avoiding a penalty structure that encourages overcompliance. Furthermore, unlike other remedies that work in theory but are difficult to implement in practice, reflection is easy to apply to many cases in which it would be a good fit. Unlike multipliers, it does not require a complex ex ante computation of probability functions and their derivatives.[152] Nor does it require a computation of the social cost of action. In short, reflection is a judicially workable solution to a general problem of encouraging compliance with the law. While it is far from a silver bullet, reflection is a regulatory tool that is deserving of adoption.

The properties of reflection also point to avenues for further exploration. They suggest that there may be fruitful, alternative remedies beyond those that courts traditionally apply.[153] Such alternative remedies need not be exotic and complex, as the simple features of reflection show. Reflective remedies also suggest that there are likely opportunities to perform reflection-like operations in additional policy areas.[154] Symmetry ideas are employed in other areas of the law as well[155] and have an appealing structure to resolve a variety of issues. By making the penalty reflect overreach, these structures reward honest attempts to get the answer right while deterring attempts to overreach. In this way, they force

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151. The other solution here is, of course, to implement constant monetary fines for overreach, but this solution requires precise pricing of these fines in a way that reflection does not. Rather, reflective principles tell us how to price the fines in question, pricing them proportionally to deter overreach. In fact, variations of reflection can be used to "set" the defendant to different points in the distribution by applying multiple reflection damages. *See infra* note 176.

152. *See supra* Section I.B.3.

153. For works that have already considered how alternative remedies can allow courts to achieve better outcomes, see, for example, IAN AYRES, OPTIONAL LAW: THE STRUCTURE OF LEGAL ENTITLEMENTS (2005).

154. *See supra* Section IV.E.

155. *See, e.g.*, *supra* note 131 (discussing the use of shotgun clauses in partnership agreements).

individuals to reveal their best guess of what the answer will be when there might otherwise be an incentive to be somewhat opaque. While this Note has focused on contracts, there is no reason why this approach cannot be expanded to other areas, like torts. The question is only to which additional situations we can apply the reflective model.[156]

156. Indeed, novel policies are a more likely avenue for adoption of these remedies. Application to common-law problems is complicated by incentives that limit the desire for judges to break from established norms. In contrast, the legislature, should it be convinced by my approach, faces no such institutional limitations.

APPENDIX A: MODELING THE IMPACT OF REFLECTION

This Appendix attempts to provide quantitative support for the claimed impact of reflective remedies on the incentives of individuals who are uncertain about the application of a rule or standard. I develop a model, based on Craswell and Calfee's work, of agents choosing in a contractual space where there is uncertainty about the application of the law. The results of the model are first analyzed in a simple context where agents are risk neutral.[157] The model is then extended to explore the case where individuals are risk averse. As the model is derived from the Craswell and Calfee model, there are obvious overlaps with their results for strong and weak penalties. These overlaps are intentional and reflect the intellectual debt this work owes to theirs.

The model shows that reflection can encourage agents to pick more "reasonable" behavior, where reasonable is defined as behavior close to the maximum allowed by the rule or standard. Compared to weak remedies, reflection better discourages overreach. Compared to strong penalties, reflection produces results that are independent of the individual's private utility function. These features mean that reflection is optimal in the sense that it improves on weak penalties while avoiding the overcompliance problems that Craswell and Calfee identify with strong penalties.[158] These improvements are not without cost. Reflection may also encourage repeated litigation to "chip away" at the standard to discover the maximum allowable behavior. However, whether this effect is desirable or not will depend on the factual setting to which reflection is applied.[159]

A. A Model of Reflection

Imagine a hypothetical space of behavior where the spectrum of individual action is one-dimensional. As with the Craswell and Calfee model, the level of behavior is represented by x. The socially optimal cap on behavior is, as in the Craswell and Calfee model, given by $x^* > 0$. Values over x^* violate the standard or rule where values under x^* do not.[160] Assume that the agents in this model face uncertainty because they do not know the value of x^* and because policymakers cannot estimate it with precision (if they could, the value could just be announced ex ante and save everyone a lot of trouble).

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157. This setting corresponds to situations where the regulated parties are wealthier or resemble corporate actors.

158. *See supra* Section I.A.

159. *See* discussion *supra* Section III.C.

160. Craswell & Calfee, *supra* note 6, at 281.

Regulated parties also know that x^* is distributed according to some probability density function $p(x)$ with corresponding cumulative density function $P(x)$.[161] As before, let $B(x)$ be the agent's benefit function, the amount of private benefit the party receives from the action prior to any legal sanctions being applied. As an initial matter, this defendant is assumed to be risk neutral and so $B(x) = x$. This means that the regulated party does not see any diminishing benefits from taking more extreme actions.[162] This assumption is then relaxed in the next Section. Finally, let $R(x)$ be the expected penalty if the agent's behavior is in excess of the optimal value. The agent then faces the following maximization problem:

$$\max_x \mathbb{E}[U(x)] = x - P(x)R(x)$$

I consider three different damage measures: for the strong penalty, the individual gives up all of the potential gain;[163] for the weak penalty, the individual gives up the amount in excess of the optimal level;[164] and for the reflective remedy, the individual gives up twice the amount of the weak penalty.[165] Note that for the weak and reflective penalties, the agent's belief about the size of the penalty depends on her belief about the location of x^*. The agent knows that, if a penalty is assessed for taking action x, then it must be true that $x^* < x$ and the action actually violated the law. This dynamic shapes how she believes reflection will be implemented. As such, she takes this information into account when making her initial choice.[166]

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161. Formally, analogously to the Craswell and Calfee model, we have $P(x) = \mathbb{P}[x^* < x] = \int_0^x p(y)dy$ where $p(y)$ is the probability density function.

162. *See* COOTER & ULEN, *supra* note 43, at 44-46. Economists presume that most individuals are averse to risk because they have diminishing marginal utility of money. *Id.* That is, as their incomes increase, each individual dollar of gain is worth less to the individual. *Id.* This then makes individuals risk averse, as a gain of one dollar has a smaller impact than a loss of the same amount. Economists commonly assume that companies are risk neutral. *Id.*

163. This is given mathematically by $R(x) = U(x) = x$.

164. This is given mathematically by $R(x) = x - \mathbb{E}[x^*|x^* < x]$. Here the conditional-expectation term accounts for the double dependency of the agent's beliefs about the penalty changing depending on the action chosen.

165. This is given mathematically by $R(x) = 2x - 2\mathbb{E}[x^*|x^* < x]$. Note that this just implements reflection over the expected value of x^*.

166. To see why this is necessary, assume that the agent is choosing between $[0,1]$ where $x^* = 0.5$. If the agent chooses 0.3, it would be somewhat absurd for her to assume that if her action is invalidated, she would be set to $x^* = 0.5$—a value greater than her initial level of behavior!

B. Solution to the Model

For the strong penalty, the equation is simple, and we obtain the first-order condition:

$$\frac{d}{dx}\,\mathbb{E}[U(x)] = \frac{d}{dx}[1 - P(x)]x = [1 - P(x)] - p(x)x$$

When the first-order condition equals zero, the agent's utility function is optimized. Therefore, the main question is which values of x solve this equation. For the strong penalty, this equation mirrors the equation derived by Craswell and Calfee and has the same interpretation.[167] The first term represents the marginal benefit of increasing x discounted by the increased probability of getting caught, while the second term represents the marginal cost imposed by the increased probability that a sanction will be applied at all.[168] If the balance of these costs and benefits is appropriate, then this may well be efficient. However, as Craswell and Calfee note, under some modest assumptions, this rule is likely to lead to overcompliance and therefore be suboptimal.[169]

For the weak and reflective penalties, the situation is somewhat more complex. Because the agent's beliefs about the size of the penalty change depending on the value of x chosen, a simplification is required.[170]

Substituting this into the equation for the weak penalty, we get a first-order condition of:

$$\frac{d}{dx}\,\mathbb{E}[U(x)] = 1 - P(x)^{171}$$

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167. *See* discussion *supra* Section I.A. Though Craswell and Calfee frame this interpretation in terms of decreases in x rather than increases, the interpretation is the same.

168. *See supra* Section I.A.

169. *See supra* note 56 and accompanying text.

170. The equation can be simplified in the following way:

$$\begin{aligned}\mathbb{E}[x^*|x^* < x] &= \int_0^\infty yp(y|x^* < x)dy \\ &= \int_0^x y\frac{p(y)}{[\ ^* <\ ]}dy \\ &= \frac{\int_0^x yp(y)dy}{P(x)}\end{aligned}$$

Here, the first step is the definition of the conditional expectation. The second makes use of the conditional distribution $p(y|x^* < x)$ to adjust the limits of the integral. Note that for $y > x$, we have $p(y|x^* < x) = 0$. The last equality applies the definition of $P(x)$.

171. This result is obtained by evaluating: $\frac{d}{dx}\,\mathbb{E}[U(x)] = \frac{d}{dx}\,x - \int_0^x yp(y)dy$.

This result mirrors the Craswell and Calfee result for incremental damages[172] and represents the reality that individuals facing the weak penalty have no incentive to choose any value other than the maximum value they can get away with. Because the highest value of $P(x)$ is one hundred percent, this expression will only equal zero when enforcement is certain, which in this model will correspond to the most egregious behavior. This is formally represented in the equation by the fact that this derivative is always positive.

Fortunately, the reflective penalty avoids such a problem, as it has the first-order condition:

$$\frac{d}{dx}\,\mathbb{E}[U(x)] = \,1 - 2P(x)^{173}$$

This means that the agent chooses $P(x) = 0.5$, the middle of the probability distribution.[174] The intuition here is surprisingly straightforward. Reflection encourages the individual to choose the middle of the distribution because it is a symmetric penalty. She therefore chooses the point where her expected view of what level of conduct triggers damages has a fifty-fifty chance of being too high or too low. This symmetry of the penalty ensures that the middle of the distribution is the point that balances the incremental benefit of increasing x with the increased risk of punishment.

We can additionally model the hybrid weak-strong remedy within this framework. Assume that $Q(x)$ is the probability that a strong remedy will be

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172. *See supra* note 69 and accompanying text.

173. This result is obtained by evaluating:

$$\begin{aligned}\frac{d}{dx}\,\mathbb{E}[U(x)] &= \frac{d}{dx}\,x - 2P(x)x + \,2\int_0^x yp(y)dy\\ &= \,1 - 2[p(x)x + P(x)] + \,2p(x)x.\end{aligned}$$

174. This result also extends to the situation where reflection is implemented through double-incremental social cost. This model is given by the following equation, where the second term is the conditional-expectation term:

$$U(x) = \,B(x) - [L(x) - \int_0^x L(y)p(y)dy]$$

Craswell & Calfee, *supra* note 6, at 296 n.23. Using $B'(x^*) = L'(x^*)$, this equation has the first-order condition:

$$dU/dx\,|_{x^*} = B'(x^*) - 2P(x^*)L(x^*) = [1 - 2P(x^*)]L(x^*)$$

Id. at 297 n.24. This equation implies a similar result. If x^* is such that $P(x^*) = 0.5$, then double-incremental damages incentivize optimal behavior. That said, there is a slight difference. In the main model, if the midpoint of the distribution is close to x^*, we can be sure that the value chosen will be close to x^*. Adding social cost to the equation means that, while this will still be true locally (assuming U, L have continuous second derivatives), agents who have incorrect beliefs about $P(x)$ may end up engaging in behavior that is far from x^*.

applied and $P(x)$ is the probability of a weak remedy being imposed.[175] Then, the agent faces the following optimization problem:

$$\max_x \mathbb{E}[U(x)] = x - P(x)(x - \mathbb{E}[x^*|x^* < x]) - Q(x)x$$

This gives the first-order condition:

$$\frac{d}{dx}\mathbb{E}[U(x)] = [1 - P(x) - Q(x)] - q(x)x$$

This is simply a modified version of the solution of the strong solution, and has a similar interpretation. The first term represents the marginal benefits of increasing the value of x chosen, while the second is the marginal cost from the increased possibility of facing the strong penalty. When the incremental cost equals the incremental benefits, the individual will stop increasing x and choose that behavior.

C. Interpretation of the Solution

For the weak and reflective penalties, interpretation of the result is straightforward. Under the weak penalty, the first-order condition is satisfied when x is set so that $P(x) = 1$. However, because $P(x)$ is a cumulative density function, this value is easy to calculate. It is simply when $x \geq 0$. In other words, the agent facing a weak penalty just picks the highest value possible, knowing that even if her contract is invalidated she will still receive x^*. The only limitation this agent faces is therefore the possibility that a truly egregious action might trigger alternative legal sanctions (e.g., an accusation of bad faith).

The equation for the agent facing the reflective remedy is similarly straightforward to interpret. She chooses the value such that $P(x) = 0.5$. This is the value where there is a fifty percent chance that her behavior is valid and a fifty percent chance it exceeds x^*. In fact, assuming the agent's beliefs are symmetric around x^*, this result implies that she will choose precisely the socially optimal level of "reasonableness" despite not knowing exactly where that point is.[176] This

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175. We also formally assume that $Q(x) + P(x) \leq 1$ to reflect that, at any point x, there is a less than one hundred percent chance of punishment.

176. In fact, the math above also points towards an even more general result: multiples of incremental damages can be used to "choose" where the individual chooses in the probability distribution. If M is a general multiplier of incremental damages, then the problem can be expressed as:

$$\max \mathbb{E}[U(x)] = x - MP(x)(x - \mathbb{E}[x^*|x^* < x])$$

This gives the first-order condition:

$$dU/dx = 1 - MP(x)$$

is the scale-blind property of reflection. It is independent of the individual's exact benefit function, and therefore this result can hold in a variety of settings.

Interpretation of cases where the agent faces the strong or a hybrid penalty is somewhat more complicated. While it is clear that the values of x that solve the equation for both penalties are less than the value of x that solves the equation for the agent facing the weak penalty, it is difficult to say much more in general about the relative efficiency of these two damage measures without further specifying $P(x)$ and $Q(x)$.[177] However, despite this issue, as noted above, the equation for the strong penalties can be interpreted as inducing x to the point where the marginal benefit of increasing x (discounted by the probability of the penalty) is offset by the marginal cost that results from the increased probability of getting punished at all.[178] That said, we can see that as x gets large, the pressure to overcomply will grow. As the stakes of action rise, the strong penalty will increasingly encourage individuals to play it safe, lest they lose all gains.

For the hybrid penalty, it is possible to say something more. If the strong component of the hybrid penalty does not apply to behavior that only exceeds x^* by a small amount, then the hybrid penalty also leads to undercompliance unless the individual is mistaken about where the strong penalty applies. Specifically, unless the individual thinks there is a positive chance of facing the strong penalty if x^* is chosen, undercompliance will always occur. For example, the individual would have to believe that she faces the possibility of a successful bad-faith claim for choosing a noncompete value that is in fact optimal. While this may occur in some cases, it requires the individual to be significantly misinformed about the application of the rule or standard to the facts in question. As a result, in many cases the hybrid penalty is unlikely to lead to optimal deterrence.

This result demonstrates the attractive properties of reflection, particularly in situations where individuals are uncertain about the application of the law rather than detection of violations or decisions to enforce the law. In these situations, if the agents in questions have beliefs that are accurate *on average*, in the sense that the probability distribution will center around the socially optimal value, then reflection will lead agents to adopt this level of behavior ex ante. Rather than leading to undercompliance, as in the case of the weak remedy, or overcompliance, as in the case of the strong remedy, reflection in these cases induces

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This has a solution when $P(x) = 1/M$. In other words, multiples of reflection damages can determine actor behavior without reference to the underlying social cost of action in the case of risk neutrality.

177. Indeed, depending on the shape of $p(x)$ the first-order condition may have multiple solutions corresponding to different local maxima and minima.

178. *See supra* Section I.A.

optimal compliance. Of course, not all situations have this property, but in the ones that do, reflection is a superior regulatory tool.[179]

These results are summarized in Table A1.

TABLE A1.
RESULTS FOR RISK NEUTRALITY

Remedy	First-Order Condition	Compliance Level
Strong	$[1 - P(x)] - p(x)x$	Ambiguous (but typically overcompliance)
Weak	$1 - P(x)$	Undercompliance
Reflective	$1 - 2P(x)$	Ambiguous (but typically optimal compliance)
Hybrid	$[1 - P(x) - Q(x)] - q(x)x$	Undercompliance (typically)

D. Risk Aversion and Reflection

Individuals will not always be risk neutral. Therefore, there is a question whether reflection is optimal in a more general setting. In line with this assumption, we assume that the individual has the general risk-averse benefit function $B(x)$.[180] As discussed above, this question is complicated by the fact that there are two plausible implementations of reflection in this setting: (1) utility reflection, where the penalty "reflects" the conduct,[181] or (2) disgorgement reflection,

179. *See supra* Part III.

180. Formally, this means that we have that $B'(x) > 0$ and $B''(x) < 0$. This set-up differs somewhat from Craswell and Calfee, who compose the risk aversion function with the private benefit function and societal loss function in their analysis. Craswell & Calfee, *supra* note 6, at 300-01. However, they note that this change can be mostly thought of as a transformation of the underlying functions, and therefore this formality is mostly illustrative of the difference in the set-up of their model. *Id.* at 301. Additionally, since the analysis here expresses penalties in terms of the benefit function, this alteration is encompassed by the change to a general function.

181. Where $R(x) = B(x) - \mathbb{E}[B(2x^* - x)|x^* < x]$. Note that this is the same expression as the one discussed above. Only here y is swapped out with x so that all terms are expressed in terms of the function's argument.

where the penalty is based on the utility the individual realized from her overreach.[182]

Of these two, disgorgement reflection is easier to analyze. Similar to reflection in the risk-neutral case, we have for the first-order condition:

$$\frac{d}{dx}\,\mathbb{E}[B(x)] = [1 - 2P(x)]B'(x)$$[183]

This equation tells us that disgorgement reflection has the same effects for risk-averse parties as it does for risk-neutral parties. Since we have $B'(x) > 0$, the individual chooses the point where the probability of facing a sanction is fifty percent and the analysis is unchanged.[184]

In the case of utility reflection, the situation is slightly more complicated. Here, we have the first-order condition:

$$\frac{d}{dx}\,\mathbb{E}[U(x)] = B'(x) - P(x)B'(x) - \int_0^x p(y)B'(2y - x)dy$$

The third step results from an application of the Leibniz integral rule. Regrettably, this result has no easy interpretation without more information about the individual functions. What is clear is that this version of reflection will typically lack the attractive feature that will lead individuals to choose the middle of the probability distribution. While some additional bounding of this term is possible, further mathematical manipulation does not increase insight.[185]

This result alters the optimality analysis of reflection in some important ways. First, the impacts of reflection will still be fairly predictable when the reg-

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182. Mathematically, this value is given by $R(x) = 2[B(x) - \mathbb{E}[B(x^*)|x^* < x]]$.

183. This is obtained by solving:

$$\begin{aligned}\frac{d}{dx}\,\mathbb{E}[B(x)] &= \frac{d}{dx}B(x) - \frac{d}{dx}2P(x)\,[B(x) - \mathbb{E}[B(x^*)|x^* < x]] \\ &= B'(x) - 2P(x)B'(x) - 2p(x)B(x) + 2p(x)B(x) \\ &= [1 - 2P(x)]B'(x).\end{aligned}$$

184. *See* discussion *supra* Section II.B.

185. In particular, the decreasing marginal utility assumption of $B''(x) < 0$ means that this term may be bounded. Precisely we have:

$$P(x)B'(x) \leq \int_0^x p(y)B'(2y - x)dy \leq\ P(x)B'(2x_{min} - x)$$

Where x_{min} is the lower bound on the range of potential values for x^*, if it exists. Note that where $x_{min} < x/2$, this upper bound becomes $P(x)B'(0)$.

185. What this means is that where the individual is relatively risk neutral, then reflection works similarly and the individual will choose a value around $P(x) = 0.5$. However, where the individual is more risk averse, the analysis is more uncertain and the most that can be said is that the individual will choose x such that $P(x) \in (0, 0.5]$.

ulated parties are approximately risk neutral, as will often be the case for corporate entities.[186] In cases where this does not hold, the situation is likely to be more complicated. Second, in cases where regulated parties have varying levels of risk aversion, reflection will achieve varying results depending on the individual agent. One of the attractions of reflection in the risk-neutral case is that the result was independent of the individual's utility function. While disgorgement reflection still has this property, it does not apply to utility reflection. The comparison between these models of reflection and strong, weak, and hybrid penalties is summarized in Table A2.

TABLE A2.
RESULTS FOR RISK-AVERSE INDIVIDUALS

Remedy	First-Order Condition	Compliance Level
Strong	$[1 - P(x)]B'(x) - p(x)B(x)$	Ambiguous
Weak	$[1 - P(x)]B'(x)$	Undercompliance
Disgorgement Reflection	$[1 - 2P(x)]B'(x)$	Ambiguous
Utility Reflection	$[1 - P(x)]B'(x) - \int_0^x p(y)B'(2y - x)dy$	Ambiguous
Hybrid	$[1 - P(x) - Q(x)]B'(x) - q(x)B(x)$	Undercompliance (typically)

Despite these difficulties, reflection may still offer some advantages over strong remedies even when individuals are risk averse. In many cases, the disagreement over the range of legal outcomes may be small because the bounds discussed above will be tight, so risk-averse agents will be locally approximately risk neutral. In these cases, risk aversion may not distort outcomes significantly when reflection damages are applied. In contrast, even when uncertainty is small, Craswell and Calfee note that strong penalties lead to overcompliance[187] and that this effect is more extreme when risk aversion is introduced.[188] Indeed,

186. *See supra* note 162 and accompanying text.

187. *See supra* note 56 and accompanying text.

188. Craswell & Calfee, *supra* note 6, at 300-01.

we can notice that the first-order conditions differ by only a single term.[189] While the exact relationship between these terms is unclear, we can see that where uncertainty is "small" (which means that $p(x)$ is large on average) the term for reflection will tend to be smaller than the term for the strong remedy. This means that, in general, reflection will tend to produce higher values of x than strong remedies in these cases, which may address the issue of overcompliance that Craswell and Calfee identify with strong penalties.[190]

Critically, even in the risk-averse context, reflection retains the property of being relatively scale blind. Because the strong penalty includes a $B(x)$ term, the greater the stakes are, the more pressure the individual will feel to overcomply. Reflection, which lacks this term (and in the case of disgorgement reflection, is independent of B entirely), does not suffer from this problem. Therefore, its optimality compared to the strong penalty is likely to be enhanced in high-stakes settings.

APPENDIX B: REFLECTION IN MULTIDIMENSIONAL SPACE

One objection to this proposal is that contractual space may be more complicated than the one-dimensional model I have presented thus far. In many cases, standards and rules have a set of socially optimal points.[191] For example, when evaluating noncompete agreements, most state courts will examine (1) how reasonable the agreement is with respect to the interests of the employer, (2) the

189. And these two terms can be linked as well. Noticing that the final term in the First-Order Condition (FOC) for the strong remedy is in terms of $B(x)$, we need a bound that has this term. We have

$$\begin{aligned}\int_0^x p(y)B'(2y-x)dy &\leq \sqrt{\int_0^x p(y)^2\,dy}\sqrt{\int_0^x [B'(2y-x)]^2\,dy} \\ &\leq \int_0^x p(y)\,dy \int_0^x B'(2y-x)\,dy \\ &\leq \frac{1}{2}P(x)B(x)\end{aligned}$$

The first step is the Cauchy-Schwartz inequality on L^2. The second step is the bound on the L^2 by the L^1 norm. And the final step is just evaluation of the integrals (where we assume $B(x) = 0$ for all $x \leq 0$).

190. Why is this the case? In both cases, the first term is a decreasing function of x and the second term is an increasing function of x. Therefore, when the second term is larger, the overall FOC will "get to" zero more quickly and the equation will be solved for smaller values of x.

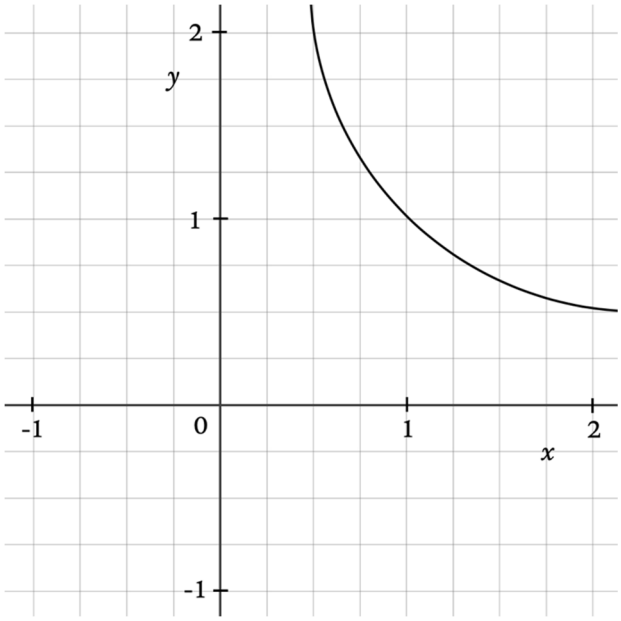
191. In fact, this may be a design feature of multifactor balancing tests rather than a bug. For example, an action that is extreme on factor 1 but modest on factor 2 may be just as socially desirable as one that has the opposite properties.

duration of the agreement, (3) the geographic scope, (4) the activity the employee conducted for the employer and its relation to the agreement, and (5) the consideration for the agreement.[192] Of course, reflection in these settings could be implemented as money damages, but not all situations in which reflection can be applied typically award money damages as a remedy. For example, money damages are typically not the remedy to overly long contracts. As a result, in a setting such as this, a new method must be developed to achieve reflection.

A. Implementations of Multidimensional Reflection

Several potential implementations of reflection in higher dimensions fail to solve the problem. Assume the standard in question has two variables and the curve in Figure B1 gives the range of acceptable points.

FIGURE B1.
SET OF SOCIALLY OPTIMAL POINTS FOR A COMPLEX STANDARD

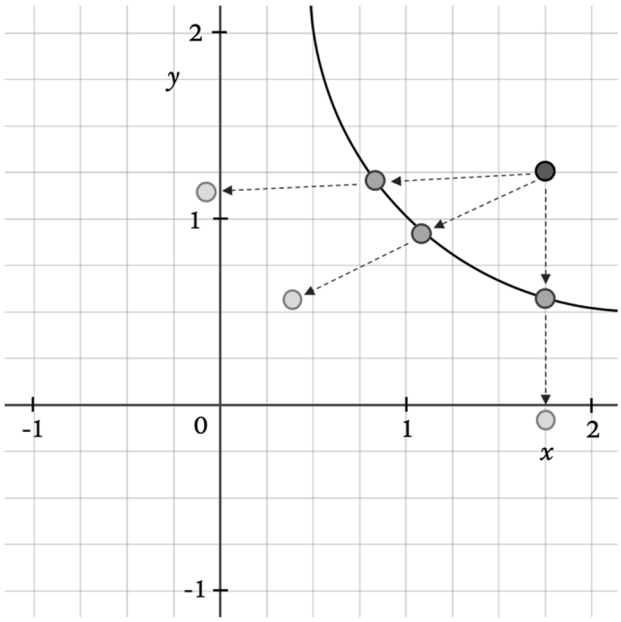


In theory, the optimal solution would be to choose a point on the curve and reflect over this point. However, this potential solution has two main issues.

192. Robert J. Orelup & Christopher S. Drewry, *Judicial Review and Reformation of Noncompete Agreements*, CONSTRUCTION L., Summer 2009, at 29, 29-30 (surveying the law of all fifty states on noncompete agreements).

First, reflection in this case will be heavily dependent on the choice of the reflection point. This reality is shown in Figure B2.

FIGURE B2.
RESULTS UNDER VARIOUS REFLECTIONS



Of course, a judge must also choose a point when implementing a weak penalty that imposes incremental damages. However, regardless of which point is chosen, the weak penalty still ultimately sends the defendant to a point that is "reasonable." In contrast, this version of reflection results in much more variation for the parties. In fact, in this example reflection can send the defendant to points with negative coordinates if the wrong reflection point is chosen, thereby creating an even harsher result than a strong penalty. Therefore, the choice of the reflection matters in a way it does not in the one-dimensional context.

This raises a second and more serious issue with this solution. How should the reflection point be chosen? Mathematically, the trier of fact could attempt to choose the point closest to the point chosen by the parties and reflect over that point. However, this raises two additional questions. First, what does "close" mean for qualitative measures? If a noncompete consists of a geographic and a time term, which contract is closest? While the time term is easy to work with, any notion of "close" would require not only some way to quantify geography but also a method to compare it with the time variable. Furthermore, even if some notion of "close" could be worked out (possibly with the assistance of the

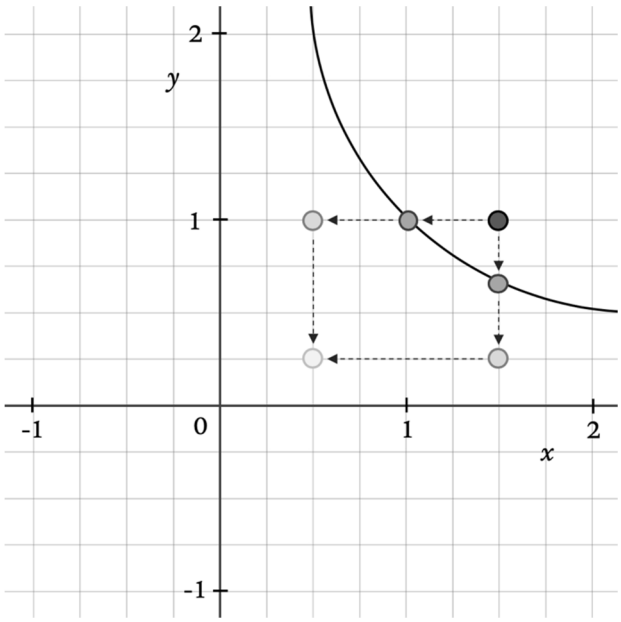
parties), what would it mean to reflect qualitative terms? For example, say that a geographic term covering New York State is to be "reflected" over the value of a term covering New York City. What is the result? While this sort of reflection is ideal in theory, it is impracticable.

To some extent, these issues can be solved by simply reflecting the individual's utility through the use of money damages.[193] Where this solution is feasible, the remainder of this analysis can be rendered irrelevant. However, two difficulties must be overcome for this solution to suffice. First, utility must be easily measurable. Where utility can be expressed in terms of profit, this bar will be easily met. However, where the issue is framed as a more general contract term, this may be more difficult. Courts will still have to answer the above concern of how to "value" the utility of a noncompete of *X* years and compare that value to other terms. Second, even where utility reflection applies, we might still want courts to reform contracts rather than award damages as a matter of public policy (or as an improvement over the status quo). Even though damages could be awarded to someone who had signed an overly restrictive noncompete, we might prefer an equitable solution to the problem. In either of these cases, the following analysis may still be valuable for implementing reflection in practice, though some of its theoretical properties will admittedly be lost.

A second, more workable solution might be to reflect each factor separately and then take the final outcome. For example, in a noncompete that featured a geographic-area term and a time term, the judge or trier of fact would reflect each factor separately, then combine the end results into a new contract. However, this implementation is also not successful. Consider the example displayed in Figure B3.

193. *See supra* Section II.C.

FIGURE B3.
COORDINATE-BASED REFLECTION



This solution has two critical issues. First, it typically imposes a penalty that is disproportionate to the violation of the rule or standard. The key idea of reflection is that small deviations from the socially optimal point are penalized by setting the defendant to a position slightly below the socially optimal point.[194] In this solution, the defendant does not receive the point at (0.5, 1) nor the point at (1.5, 0.25), either of which would be a reflection, and instead receives the point at (0.5, 0.25), which is more punitive than either of the former points.[195] Second,

194. More precisely, the penalty function should map $x + \epsilon \to x - \epsilon$.

195. This can be made slightly more formal in the following way. Assume the curve is given by the function $f(x) = 1 - x$, a simple linear function. Then points of the form $(x, 1 - x)$ form the outer boundary of the curve. If the defendant then exceeds these boundaries by small values ϵ_1, ϵ_2 so that she is at point $(x + \epsilon_1, 1 - x + \epsilon_2)$, application of this version of reflection would bring her to $(x - \epsilon_1 - 2\epsilon_2, (1 - x) - 2\epsilon_1 - \epsilon_2)$. When $\epsilon_1 = \epsilon_2$, this value $(x - 3\epsilon_1, (1 - x) - 3\epsilon_1)$ is, in essence, a quadruple-incremental damages remedy, far exceeding the symmetry that motivated the reflective proposal.

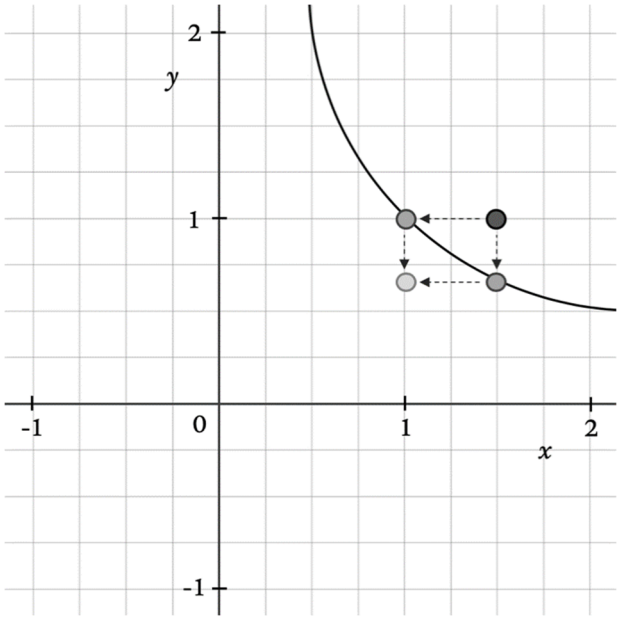
In fact, this issue compounds as the number of dimensions added becomes higher. In n dimensional space, if the socially optimal frontier is given by $\sum_{i=1}^{n} x_i = 1$ (a hyperplane of constant "slope" in all directions) and $\vec{x}$ is a point on this frontier, then $\vec{x} + \epsilon \cdot \vec{1}$ will be reflected to $\vec{x} - (2n - 1)\epsilon \cdot \vec{1}$. The penalty scales at double the number of factors considered.

this implementation still requires the trier of fact to make the difficult computations discussed above when qualitative terms are included. This solution is therefore not a successful implementation of reflection in this new context.

B. A Second-Best Solution to Multidimensional Reflection

Thankfully, there is a solution to these issues. Rather than adopting either of the above approaches, the trier of fact can work factor by factor to construct an alternative. In this implementation, for each factor, the trier of fact determines what the maximum reasonable value of that factor would be holding all other factors constant. To take a concrete example, assume an employer and employee bargain for a noncompete that is two years long and covers all of New York State. To apply reflection in this context, the trier of fact first asks what the maximum geography is that would be "reasonable" when combined with a two-year contract. The trier of fact next asks what the maximum length of a contract covering all of New York would be. The answers are then combined to give the new solution to the problem. Graphically, this can be represented as in Figure B4.

FIGURE B4.
REFLECTION IN TWO DIMENSIONS



This solution fixes the issues with the naïve solutions by choosing a penalty that is more proportional to the amount by which the standard is exceeded but

that is also workable for a trier of fact.[196] Admittedly, this solution does suffer from the same scaling problem as factor-by-factor reflection. As more dimensions are added, this implementation of reflection does become more and more punitive.[197]

However, this form of reflection is still superior to the other options discussed above.[198] First, unlike the first solution, this algorithm can be implemented without the need to quantify and compare multiple qualitative factors. The implementation here avoids complex, and potentially arbitrary, comparisons by applying a factor-by-factor approach. Second, while imperfect, this implementation preserves the basic structure of the incentives that reflection is designed to create. Individuals facing this penalty still have an incentive not to reach beyond socially optimal behavior because reflection still scales between a weak and strong penalty as the defendant's overreach increases. Furthermore, assuming the number of factors involved is small, this penalty approximates reflection well, while still remaining workable for judicial decision-making. As a result, while this implementation is second-best, it enables legal decision-makers to leverage the benefits of the reflective penalty without having to make complex normative decisions that may be outside of the institutional competence of the legal system.

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196. For the linear function discussed above, $(x + \epsilon_1, 1 - x + \epsilon_2)$ is now mapped to $(x - \epsilon_1, 1 - x - \epsilon_1)$. *Supra* note 81.

197. For the socially optimal frontier $\sum_{i=1}^{n} x_i = 1$, under this implementation of reflection $\vec{x} + \epsilon \cdot \vec{1}$ will be reflected to $\vec{x} - (n-1)\epsilon \cdot \vec{1}$. While this improves on factor-by-factor reflection, it is still nonideal.

198. Regrettably, optimality is likely to be difficult to analyze in the multidimensional case. This is because, in general, the individual faces the problem of solving the utility maximization problem:

$$\max_{x,y} \mathbb{E}[U(x,y)] = B(x,y) - 2P(x,y)[B(x,y) - \mathbb{E}[x^*|y > f(x)]]$$

Here, $f(x)$ is the efficient frontier. However, since x^* is now a set of points, it is unclear how to analyze the expectation term in this equation. Even when we specify second-best reflection, the problem changes to:

$$\max_{x,y} \mathbb{E}[U(x,y)] = B(x,y) - 2P(x,y)[B(x,y) - B(f^{-1}(y), f(x))]$$

This is a problem that is likely to vary based on the legal issue faced.