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Keith Hylton

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Abstract: Calabresi and Melamed published the seminal article on property rules and liability rules in 1972. In recent years new articles presenting rigorous analyses of bargaining incentives have overturned some of the fundamental claims of the Calabresi-Melamed analysis. In particular, the proposition that property rules are socially preferable to liability rules when transaction costs are low appears to be either no longer valid or severely weakened under the new analyses. This paper reexamines the property rule versus liability rule question in light of the contributions of the recent bargaining theory literature. In contrast to this literature, I find that the fundamental propositions of Calabresi-Melamed remain valid, and I extend the framework to provide a more detailed positive economic theory of common law rules. The key contribution of this paper is pointing out the importance of subjective valuations in the analysis of property and liability rules. This allows for a synthesis of Calabresi-Melamed and the bargaining theory literature within an expanded framework.

* Professor of Law, Boston University, knhylton@bu.edu. For helpful comments and responses on the first draft of this paper, I thank Ronen Avraham, Guido Calabresi, Richard Epstein, Wendy Gordon, and Richard Posner. For helpful comments on the second draft, I thank Bob Bone, Andrew Kull, David Haddock, and workshop participants at Boston University, Northwestern University, and George Mason University.

I. Introduction

The law reflects two general policies in its effort to regulate conduct. One is a policy of prohibition, of simply not tolerating certain acts or types of conduct to any degree. The other is a policy of "pricing" or "internalization", which requires law violators to pay for the injuries to their victims, but does not attempt to completely suppress or deter the conduct that gave rise to the victims' injuries.[1] A theory that explains why one policy should be preferred to the other can go a substantial way toward explaining many of the rules of tort, property, and criminal law.

Legal scholars typically refer to this choice between policies as a choice between property rules and liability rules.[2] Property rules, as the name suggests, secure entitlements as property. To secure something as property, the rules must effectively prohibit others from taking or damaging the entitlement without first gaining the consent of the owner. Liability rules, on the other hand, do not seek to provide the security of a property rule. Liability rules do not seek to force those who would take or damage an entitlement from first gaining consent, or to take actions that would harm the entitlement only under conditions in which consent would likely have been given.[3] Liability rules

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[1] The distinction between these two general policies has been noted in many articles. Perhaps the best known effort to generalize and build a theory based on this distinction is Guido Calabresi and Douglas Melamed, Property Rules, Liability Rules and Inalienability: One View of the Cathedral, 85 Harv. L. Rev. 1089 (1972). The distinction has also been described as one between "prices" and "sanctions", see Robert Cooter, Prices and Sanctions, 84 Colum. L. Rev. 1523, 1523 (1984). The distinction between a policy of prohibition versus one of internalization was also central to Becker's seminal article on the economics of criminal law, see Gary S. Becker, Crime and Punishment; An Economic Approach, 76 J. Pol. Econ. 169 (1968).

[2] This is based on the language of Calabresi and Melamed, supra note 1.

[3] One might argue that the negligence standard, a type of liability rule, sets up incentives that approximate those under a regime of consensual transactions. See, e.g., Richard A. Posner, A Theory of Negligence, 1 J. Legal Studies 29, 37 (1972) (describing negligence rule as approximating the safety precautions that would have been agreed upon if the parties had negotiated). Under the negligence rule, the injurer faces no liability, and therefore makes no effort to take care, whenever the cost of care exceeds the expected harm to

seek simply to require the party taking or damaging the entitlement to pay a damage assessment determined by a court. One can think of the difference between the rules in terms of the expectations of actors. Property rules seek, as Bentham once put it, to secure and to settle expectations with respect to an entitlement.[4] Liability rules, in contrast, aim merely to reallocate the burden of a loss after it has occurred.

This paper presents a simple economic analysis of property rules and liability rules. My aim is to try to bring clarity to an area of legal theory that has become rather confused lately. Calabresi and Melamed published the seminal article on property rules and liability rules in 1972,[5] and for many years the results of that analysis had gone unquestioned.[6] Moreover, the Calabresi-Melamed analysis has formed the basis for more than one rich positive theory of the common law.[7] In recent years, however, new articles presenting rigorous analyses of bargaining incentives have overturned some of the

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the victim. One could argue that in this case, the injurer would have purchased the consent of the victim under a regime of consensual transactions. But the negligence rule approximates market conditions in only a rough sense. The damage awards under negligence law are at best a rough approximation and probably far below the amount that would be demanded by most victims in order to permit the injurer to inflict a substantial physical injury. See, e.g., Calabresi and Melamed, supra note 1, at 1125 ("Liability rules represent only an approximation of the value of the object to its original owner and willingness to pay such an approximate value is no indication that it is worth more to the thief than to the owner").

[4] Jeremy Bentham, Theory of Legislation, 68-69 (Oceana Pub. Inc. 1975); Jeremy Bentham, Security and Equality of Property, 51, reprinted in Property: Mainstream and Critical Positions (C.B. Macpherson, ed.), 39-58 (Toronto: Univ. of Toronto Press, 1978).

[5] Calabresi and Melamed, supra note 1.

[6] For an intellectual history of the Calabresi-Melamed analysis, see James E. Krier and Stewart Schwab, Property Rules and Liability Rules: The Cathedral in Another Light, 70 N.Y.U. L. Rev. 440, 440-456 (1995). Krier and Schwab cite A. Mitchell Polinsky's discussion of nuisance law as the first published piece to question the conclusions of the Calabresi-Melamed article. See A. Mitchell Polinsky, Resolving Nuisance Disputes: The Simple Economics of Injunctive and Damage Remedies, 32 Stan. L. Rev. 1075 (1980).

[7] See Thomas W. Merrill, Trespass, Nuisance, and the Costs of Determining Property Rights, 14 J. Legal Stud. 13 (1985); Richard A. Posner, An Economic Theory of the Criminal Law, 85 Colum L. Rev. 1193 (1985); Michael Wachter and George Cohen, The Law and Economics of Collective Bargaining: An Introduction and Application to the Problems of Subcontracting, Partial Closure, and Relocation, 136 U Pa. L. Rev. 1349, 1364-1376 (1988).

fundamental claims of the Calabresi-Melamed analysis.[8] The most comprehensive of these articles is one by Steven Shavell and Louis Kaplow.[9] In particular, one key part of the Calabresi-Melamed analysis, the proposition that property rules are socially preferable to liability rules when transaction costs are low, appears to be either no longer valid or severely weakened under the new analyses.[10] This has important implications for much of the positive legal theory developed on the basis of this proposition.[11]

This paper reexamines the property rule versus liability rule question in light of the contributions of the recent bargaining theory literature. In contrast to this literature, I find that the fundamental propositions of the Calabresi-Melamed analysis remain valid for the most part,[12] and I extend the framework to provide a more detailed positive

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[8] Louis Kaplow and Steven Shavell, Property Rules and Liability Rules: An Economic Analysis, 109 Harv. L. Rev. 713 (1996); Ian Ayres and Eric Talley, Solomonic Bargaining: Dividing a Legal Entitlement to Facilitate Coasean Trade, 104 Yale L. J. 1027 (1995). For articles building on the contributions of these two, see Ian Ayres and Paul M. Goldbart, Optimal Delegation and Decoupling in the Design of Liability Rules, 100 Michigan L. Rev. 1 (2001); Ian Ayres and Paul M. Goldbart, Correlated Values in the Theory of Property and Liability Rules,23 J. Legal Stud. 121 (2003); Ronen Avraham, Modular Liability Rules, 24 International Rev. Law and Econ 269-97 (2004). For an article anticipating (though without formal analysis) some of the arguments of the Shavell and Kaplow and Ayres and Talley pieces, see James E. Krier and Stewart Schwab, Property Rules and Liability Rules: The Cathedral in Another Light, 79 N.Y.U. L. Rev. 440 (1995).

[9] Kaplow and Shavell, supra note 8.

[10] Kaplow and Shavell, supra note 8, at 718 ("In addition, we will cast doubt on the belief that property rules are best when transaction costs are low – assertedly because the use of property rules will induce parties to bargain and reach desirable outcomes – whereas liability rules are best when transaction costs are high – supposedly because the use of liability rules will induce injurers to act desirably, mimicking the outcomes that would otherwise have been reached through bargaining.").

[11] For example, Posner's positive economic theory of criminal law, supra note 7, appears to be based on the Calabresi-Melamed analysis, see infra text accompanying notes 111 - 112. If the Calabresi-Melamed analysis is wrong, then Posner's theory falls with it. This is distinguishable from the case in which a theory is challenged for having "unrealistic" assumptions. For discussion of the importance of assumptions, see Milton Friedman, Essays in Positive Economics ch.1 (Chicago: University of Chicago Press, 1953) (presenting the case for positive economic analysis and defending economic analysis against the critique that its assumptions are unrealistic). The bargaining theory literature implies that the Calabresi-Melamed analysis is logically flawed – like a theory that depends on the assumption that one plus one is equal to three. If the critique of the Calabresi-Melamed analysis contained in the bargaining theory literature is correct, then that analysis and others that build on it must be invalid.

[12] Richard Epstein's most recent contribution to the property versus liability rules literature is in some respects similar to this paper and in others quite different, see Richard A. Epstein, A Clear View of the Cathedral: The Dominance of Property Rules, 106 Yale L. J. 2091 (1997). Like this paper, Epstein's paper reexamines the property versus liability rules question in light of relatively recent contributions to the literature. Unlike this paper, Epstein argues, contrary to Calabresi and Melamed, that property rules are

economic theory of common law rules. The key contribution of this paper is pointing out the importance of "subjective valuations" in the analysis of property and liability rules. Property rules, unlike liability rules, protect the subjective valuations of entitlement holders.[13] I show that Calabresi and Melamed's conclusions with respect to property rules depend heavily on this protective function. In particular, if subjective valuations are not protected, as is the case under the liability rule, society will incur greater rule enforcement and *denormalization* costs than would be incurred under the property rule. I use the term denormalization to refer to the whole array of costs (reduced investment incentives, enhanced taking incentives, reciprocal takings, protective investments, shortened planning horizons) incurred when norms respecting property break down.[14]

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generally preferable to liability rules, except in the cases of hold out and bilateral monopoly. A different approach to this issue is reflected in Henry E. Smith, Property and Property Rules, 79 N.Y.U. Law Review 1719 (2004). Smith also reexamines the debate in light of the contributions of the bargaining theory literature. Smith argues that property rules are preferable generally because information about the value of property is costly to produce, and property rules allow those who incur those costs to reap and hold on to the rewards. Smith's argument is a largely, though not entirely, Hayekian defense of property rules. Another article that discusses the recent contributions and goes on to suggest that property rules should be preferred to liability rules is Carol Rose, The Shadow of the Cathedral, 107 Yale L. J. 2175 (1997).

[13] The protective function (i.e., protecting subjective valuations) of property rules is noted in the Calabresi and Melamed article, supra note 1, at 1092, 1105. However, because the Calabresi-Melamed discussion is informal, the importance of this protective function in their analysis may seem unclear to many readers. One recent discussion of property and liability rules that points to the importance of the protective function of property rules where subjective valuations are heterogeneous is Richard A. Posner, Economic Analysis of Law 68-70 (6th ed. 2003). Posner, responding to the implications of the bargaining theory literature, argues that if damages awards are equal to average harm, those who expect their harm to be greater than average will take precautionary measures to avoid the taking, and those who expect their harm to be less than average will take no precautions. The result would be "excessive efforts at taking and preventing the taking of property." Id. at 69. For an analysis of precautionary and other investment incentives under property and liability rules, in the context of harmful externalities, see Lucian A. Bebchuk, Property Rights and Liability Rules: The Ex Ante View of the Cathedral, 100 Mich. L. Rev. 601 (2001).

[14] Denormalization includes the "demoralization" costs (Frank Michelman's term) that occur because when property is expropriated, victims are demoralized, weakening their incentives to invest in property in the future. See Frank I. Michelman, Property, Utility, and Fairness: Comments on the Ethical Foundations of "Just Compensation" Law, 80 Harv. L. Rev. 1165, 1214-1215 (1967). More specifically, Michelman defined demoralization costs as "the total of . . . the dollar value necessary to offset disutilities which accrue to losers and their sympathizers specifically from the realization that no compensation is offered, and . . . the present capitalized dollar value of lost future production (reflecting either impaired incentives or social unrest) caused by demoralization of uncompensated losers, their sympathizers, and other observers disturbed by the thought that they themselves may be subjected to similar treatment on some other occasion." Id. at 1214. Since Michelman's definition does not seem to include some other costs that

I extend the analysis of property and liability rules to generate a more detailed statement of the choice between the two rules (or rule types). The basic propositions originally set out in Calabresi and Melamed can be framed, and stated more expansively, in terms of the assumptions regarding transaction costs and the subjective valuations of takers (or injurers) and victims.

The model presented in this paper allows for a synthesis of the results from Calabresi and Melamed and from the bargaining theory literature within an expanded framework. The bargaining theory literature has expanded the analysis of property and liability rules by focusing on a special case in which bargaining is feasible but the likelihood of bargaining failure is substantial. The reason emphasized in the bargaining theory literature for the substantial likelihood of bargaining failure is informational asymmetry – in particular, each party to a bargain knows his own subjective valuation but only (at best) the distribution of subjective valuations for other bargaining parties.[15] The case in which bargaining is feasible although the probability of failure is substantial is an important special case that does not fit easily within the high-versus-low transaction cost framework introduced in Calabresi and Melamed.[16] The special case is so important that an expanded framework should take into account three scenarios: high transaction costs, where parties are unlikely to reach an agreement or to even bargain (perhaps because the cost of meeting to negotiate is prohibitive); low transaction costs, where parties always

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are likely to follow from expropriation (e.g., protective expenditures, investment in technology that facilitates taking), I have opted for an alternative term.

[15] Ayres and Talley, supra note 8, at 1035 and n.30; Kaplow and Shavell, supra note 8, at 720, 734-738.

[16] Confusion over which category (high versus low transaction costs) is appropriate for the informational asymmetry case is observable in the literature. Kaplow and Shavell examine the asymmetric case as part of their analysis of bargaining under low transaction costs, see Kaplow and Shavell, supra note 8, at 720. However, Calabresi and Melamed suggested that the asymmetric information case belongs in the high transaction cost category, see infra text accompanying notes 86-87; Calabresi and Melamed, supra note 1, at 1119. This simple difference in labeling is one of the reasons the conclusions of Kaplow and Shavell diverge from those of Calabresi and Melamed.

bargain to an agreement; and *intermediate transaction costs*, where the cost of meeting to bargain is low but the likelihood of failure to reach agreement is substantial (because of strategic behavior).[17]

The new proposition regarding property rules and liability rules should be set out for the three cases of high, low, and intermediate transaction costs. The simplest version covers the polar cases of high and low transaction costs, and in these extreme cases the basic propositions of Calabresi and Melamed remain largely intact (with minor extensions to reflect the importance of subjective valuations). For the high and low transaction cost settings, the new proposition consists of the three parts and can be stated as follows. *(1) When transaction costs are high, and some takers have subjective valuations that exceed those of victims, the liability rule is preferable to the property rule protecting the victim. (2) When transaction costs are high and the subjective valuations of victims exceed those of all takers, then the property rule protecting the victim is equivalent to the liability rule. (3) When transaction costs are low, the property rule is preferable to the liability rule – irrespective of the distribution of subjective valuations*.

For the intermediate transaction costs case – i.e., the case in which the cost of meeting to bargain is low but the likelihood of bargaining failure substantial – the choice between the property rule and the liability rule depends on a balancing of the costs from failing to protect subjective valuations and the costs of bargaining failure. If the costs of

[17] This suggests that transaction cost settings can be analyzed in terms of the *costs of coordination* and the *costs of assent*. The standard low transaction cost setting is one of low coordination and assent costs. For example, if the parties can meet to bargain easily (low coordination costs) and both are perfectly informed, one would say that transaction costs are low. The standard high transaction cost assumption is usually one of high coordination costs. For example, in the traffic accident setting, coordination costs prevent parties from meeting to bargain before an accident occurs. When coordination costs are high, it does not matter whether assent costs are low or high because the parties will be unable to bargain. The intermediate transaction cost case I define in the text is one of low coordination costs and high assent costs. The term intermediate should not be understood to imply that the costs of bargaining failure are low in comparison to the high transaction cost case.

bargaining failure are low relative to those that result from failing to protect subjective valuations, the property rule protecting the victim is socially preferable.[18] On the other hand, if the costs of bargaining failure are relatively high – say, because almost all bargains would fail – , the liability rule is preferable to the property rule. Although the balancing test is an empirical question, society has already provided answers to it in many parts of the law.[19] For example, eminent domain substitutes a liability rule for what would ordinarily be a property rule, precisely because the costs and frequency of bargaining failure are likely to be high relative to the costs of failing to protect subjective valuations.[20] For essentially the same reason, nuisance law substitutes a liability rule in a setting in which a property rule would be a feasible alternative, given the ease with which adjacent land possessors can meet to bargain.[21] And in the labor law context, we see the opposite approach: even though the likelihood of bargaining failure is substantial,[22] the law has remained with a property rule, though modified in order to reduce the likelihood

[18] Bargaining failure – that is, the failure of bargaining to lead to an agreement – is costly because it results in forgone opportunities for both parties to the bargain to enhance their welfare. For example, if an agreement between A and B would have improve the welfare of A by $20 and the welfare of B by $20, the cost of bargaining failure is the forgone gain of $40. Failing to protect subjective valuations is costly for reasons given earlier: (1) expropriated victims sue, generating administrative costs, and (2) both expropriated and potential victims are "demoralized" to the extent that they can no longer feel secure in their holdings and potential takers are emboldened (denormalization costs). Suppose the sum of administrative (litigation) and denormalization costs, discounted to present value, is $100. Since, under these assumptions, the cost of failing to protect subjective valuations, $100, is greater than the cost of bargaining failure, $40, the property rule is preferable to the liability rule.

[19] This point is also made in Epstein, supra note 12, at 2095.

[20] Although Calabresi and Melamed do not state this proposition, their discussion of eminent domain suggests that this is the likely explanation for the emininent domain rule, see Calabresi and Melamed, supra note 1, 1106-1108.

[21] Thomas Merrill introduced the distinction between transaction costs and "entitlement-determination" costs in order to explain the rules that have developed under the nuisance law, see Merrill, supra note 7, at 19-26. Under this approach, many nuisance settings involve low coordination costs, since the parties are often adjacent landowners. However, the same disputes typically involve high entitlement-determination costs, since the definition of the entitlement in dispute is often unclear.

[22] This is because of the informational asymmetry problem. Wachter and Cohen, supra note 7; Keith N. Hylton, An Economic Theory of the Duty to Bargain, 83 Geo. L. J. 19 (1994).

of bargaining failure.[23] As these examples suggest, the expanded property-versus-liability-rule propositions set out in this paper help us understand some fundamental features of the common law.

Indeed, one goal of this paper is to use the property versus liability rule distinction to generate a more detailed positive theory of the law than has been offered previously in the literature on property and liability rules. In this sense, I am returning to the initial direction taken by Calabresi and Melamed, who laid the groundwork for theories that take the distinction between property and liability rules as a foundation from which to gain a deeper understanding of the common law.[24] The more detailed propositions regarding property rules and liability rules offered here generate explanations for the treatment of reckless and negligent conduct in tort law, as well as that of reckless and intentional endangerment in criminal law. The theory also explains the conditions under which damages should be awarded for pain and suffering, and under which compensatory and punitive damages should be assessed. The final application uses property rule theory to justify the bargaining doctrine in labor law.

Part II of this paper reviews the literature on property rules and liability rules, focusing on the initial contribution of Calabresi and Melamed and the recent contributions of the bargaining theory literature.[25] Part III presents a simple model of

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[23] I am referring to the duty to bargain doctrine of labor law. Wachter and Cohen, supra note 7; Hylton, Duty to Bargain, supra.

[24] Calabresi and Melamed did use their theory to explain important features of the common law, though they provided only an outline or sketch. See Calabresi and Melamed, supra note 1, at 1106-1110 (general theory of property and liability rules) and 1124-1127 (sketching application of theory to criminal law and nuisance law). The latter half of this paper uses the more detailed property-versus-liability rule propositions of this paper to provide a broader and more detailed justification for common law rules.

[25] I focus on the bargaining theory literature because this literature suggests that the Calabresi-Melamed conclusions are invalid, largely within the terms of their original model. Polinsky's analysis, as Krier and Schwab note, supra note 6, at 453-455, shows that when damage assessment costs are taken into account the Calabresi-Melamed conclusions become unreliable. Krier and Schwab argue that damage assessment

bargaining over entitlements, assuming the absence of informational or other incentive impediments to reaching agreement. I examine the welfare implications of property and liability rules in Part III. In Part IV, I compare property and liability rules when there are informational or other incentive impediments to reaching agreement. Part V briefly covers the case of harmful externalities. Part VI discusses implications for law. In this part I use the extended property-versus-liability-rule propositions to justify some basic features of tort, criminal, and property law, as well as the modified or conditional property rule created by labor law.

II. Literature Review

The literature in this area obviously begins with Calabresi and Melamed's article. The short "sound-byte" version of the fundamental proposition of Calabresi and Melamed is that property rules are preferable to liability rules when bargaining (or transaction) costs are low. To be more precise, the proposition should be stated as follows: when transaction costs are low, a property rule protecting the victim is preferable to a liability rule in which the injurer pays the victim's damages.

The argument for this proposition is that when transaction costs are low, an individual who is interested in acquiring the property of another individual should bargain for the property in order to reach a price that both parties find agreeable.[26]

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costs are likely to be higher than transaction costs, which suggests a social preference for property rules, id., 453-465. This is also suggested by the argument of Smith, supra note 12. While this is a very important point, it introduces a feature that is not part of the original Calabresi-Melamed model.

[26] Calabresi and Melamed, supra note 1, at 1105 (suggesting property rules protect subjective valuations) and 1106 (suggesting property rules lead to economically efficient transfers). See also, Richard A. Posner, Economic Analysis of Law 69 (6th ed. 2003).

Property rules encourage bargaining by prohibiting the taking of property.[27] However, when transaction costs are high bargaining is infeasible. The only role left for the law is to reallocate the risk of loss of the entitlement between the two parties.

Liability rules appear in this argument to be second-best options that are chosen by the law, in the high transaction cost setting, because property rules would be ineffective. Property rules would be ineffective in the high transaction cost setting because bargaining would not occur, and because the rules would work to obstruct a great deal of legitimate activity.[28] If a car driver were required by the law to negotiate with every pedestrian at risk of being hit by his car to gain permission to impose that risk, cars would be largely useless.

A new literature focusing on bargaining incentives has questioned some of the key parts of the Calabresi-Melamed theory. The new articles have substantially advanced the theory of property and liability rules by introducing a careful analysis of bargaining incentives.[29] Since the Kaplow and Shavell paper presents the most general analysis, I will focus on their treatment.

Kaplow and Shavell examine bargaining under property and liability rules in the high transaction cost and low transaction cost settings. In the high transaction cost setting, they conclude that the liability rule (with damages equal to average harm) is preferable to either a property rule protecting the victim or a property rule protecting the

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[27] Calabresi and Melamed, supra note 1, at 1092.
[28] Calabresi and Melamed, supra note 1, at 1109.
[29] In particular, papers written by Ian Ayres and Eric Talley and by Louis Kaplow and Steven Shavell have modified the theory of property and liability rules. For another article that incorporates a more detailed analysis of bargaining incentives, see Krier and Schwab, supra note 6. While Krier and Schwab do not challenge the basic propositions from Calabresi and Melamed, their analysis anticipates some of the issues examined more rigorously in the Kaplow and Shavell article.

injurer.[30] Although this conclusion agrees with that of Calabresi and Melamed, they provide a stronger case for the liability rule. While the liability rules appears as a second-best option in the Calabresi-Melamed analysis, Kaplow and Shavell argue that the liability rule is preferable because it exploits the private information held by injurers.[31] An injurer who knows that his cost of forbearance or precaution is greater than the victim's harm will not forbear under the liability rule, while an injurer who knows that his cost of forbearance is less than the victim's harm will forbear under the liability rule. These are the efficient outcomes.[32] Moreover, property rules are incapable of exploiting the private information of injurers in this fashion, and would therefore lead to inefficient outcomes in the high transaction cost setting.

In the low transaction cost setting, Kaplow and Shavell first analyze the case of perfect information,[33] a setting in which both parties to a bargain know what the other needs in order to reach an agreement;[34] and given this knowledge, bargaining is always successful. In the perfect information case, Kaplow and Shavell show that property and

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[30] Kaplow and Shavell, supra note 8, at 727.
[31] Id. at 725.
[32] Of course, this assumes that the damages remedy accurately compensates for harm suffered. If the damage award always falls substantially below (or above)
the harm suffered, then the liability rule will not lead to the efficient outcome.
[33] Kaplow and Shavell use different terms, describing the case more generally as one in which bargaining is always successful, Kaplow and Shavell, supra note 8, at 733.
[34] The perfect information assumption guarantees (or generally should guarantee) that bargains will be successful, because both parties know precisely the point that must be reached in order to reach an agreement. This is stronger than the assumption of complete information with respect to reservation prices. Suppose, for example, A and B are bargaining over a coffee mug. Suppose A owns the coffee mug, and B is attempting to purchase it. In the complete information case, A knows the maximum that B is willing to pay for the mug, and B knows the minimum that A must get in order to sell the mug. Moreover, each party knows that the other knows its reservation price. In other words, A's "asking price" is common knowledge and B's "offer price" is also common knowledge. See Robert Aumann, Agreeing to Disagree, Annals of Statistics 4, 1236-9, 1976; John Geanakoplos, Common Knowledge, Journal of Economic Perspectives 6:53-82, 1992. However, even if the parties share complete information with respect to reservation prices, they may still fail to reach agreement because they cannot agree on a division of the surplus. The perfect information assumption implies that the parties know not only their respective reservation prices, but also the precise division of surplus that satisfies both sides of the agreement.

liability rules are equivalent in terms of bargaining outcomes.[35] This contradicts the Calabresi-Melamed article. In the imperfect information case (i.e., the case in which the parties do not know what the other needs in order to reach an agreement), Kaplow and Shavell conclude that property rules and liability rules cannot be ranked on efficiency (or welfare) grounds. Neither rule leads to the efficient outcome, and the relative efficiency of the two rules cannot be determined a priori.[36] Again, this is a result that contradicts Calabresi and Melamed.

In the end, Kaplow and Shavell conclude that property rules are probably preferable to liability rules in the low transaction cost setting, but not because of the bargaining arguments originally advanced in Calabresi and Melamed. They point to the problem of "reciprocal takings" (if you steal my car, I will retaliate by stealing your car) and bad incentive effects of a rule permitting takings.[37]

I have no quibbles with the basic analysis of the new bargaining theory literature. However, I will show below that the failure of this literature to focus on the protection of subjective valuations causes its conclusions to be incomplete, and its implicit critique of Calabresi and Melamed to be invalid. I will focus largely on the perfect information case (bargaining is always successful), since this is the core of the controversy.

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[35] Kaplow and Shavell, supra note 8, at 733. As Kaplow and Shavell note, id., at 732, the conclusion that property and liability rules are equivalent in the no transaction cost setting is an implication of the Coase theorem. According to the Coase theorem, the efficient allocation will always result from bargaining when transaction costs are low. R.H. Coase, The Problem of Social Cost, 3 J. Law & Econ. 1 (1960). Without reaching the conclusion of Kaplow and Shavell, the discussion in Krier and Schwab shows an awareness of the difficulties the Coase theorem poses for the basic propositions of Calabresi and Melamed, see Krier and Schwab, supra note 6, at 450 n.37.

[36] Kaplow and Shavell, supra note 8, at 779-787. For an informal explanation of their conclusion, see infra text accompanying notes 80 - 85.

[37] Id. at 722. See also Fred S. McChesney, Boxed In: Economists and the Benefits from Crime, 12 Int'l Rev. L. & Econ. 225 (1993).

III. Transactions and Perfect Information

In this Part, I will use a model presented through a numerical example to analyze welfare outcomes under property and liability rules. I will focus on the case in which all parties are informed of the valuations other parties put on any given property.

A. Market Not Available: High Transaction Costs

I will refer to the holder of property as the "victim", and the potential taker of property as "taker". Suppose each victim owns a bicycle worth $75 on the market – i.e., *objectively valued*.[38] However, the victim's *subjective valuation* may differ from the market value.[39] For example, the victim may have fond memories associated with his bicycle – learning how to ride or to do new tricks on it, winning races – and for this reason will demand more than $75 in a trade. On the other hand, the victim may have negative thoughts associated with the bicycle – terrible falls, flat tires – and might be willing to sell it for less than its market value of $75.

Victims come in two types: "high-valuing" victims and "low-valuing" victims. High-valuing victims place a subjective valuation of $85 on the bicycle. This means that even though the bicycle has an objective market value of $75, they will not voluntarily

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[38] The objective value of an item might be determined by the market equilibrium price – that is, the price at which the quantity supplied on the market equals the quantity demanded. For items that have unique features, such as a house, the objective value might be determined by an auction, or by comparing comparable items.

[39] The victim's subjective valuation of an item can be viewed as his maximum bid for that item. For example, a widget might have a market value of $10, yet some consumer might be willing to pay considerably more than $10 for the widget. The subjective valuation may reflect more than the mere hedonistic preferences or special feelings for the item. For example, a person may be willing to bid more than the market price for a bicycle because he knows something about the value of the bicycle that others do not, or because he needs the bicycle for an important work assignment.

sell their bicycles for less than $85. Low-valuing victims place a subjective valuation of $65 on their bicycles. I will assume, in addition, that the population of victims is split evenly between high- and low-valuing types. It follows that the average of the victims' subjective valuations is equal to the objective market value of $75.[40]

If a victim were to appear in court seeking damages for a stolen bicycle, the court would award the victim the objective value. This is a reasonable assumption. Courts cannot determine subjective valuations; the expense of the effort would be prohibitive. But they can easily get their hands on objective market value data for many items. Thus, under a liability rule, victims would be awarded $75.

Now consider the population of takers. As the name suggests, takers attempt to acquire bicycles from victims. Like victims, takers come in two types. One type, high-valuing takers, places a subjective valuation on a bicycle of $100. The other, low-valuing takers, places a subjective valuation of $25. Half of the takers are of one type, and half of the other type.[41]

Assume transaction costs are high, so that there is no opportunity for takers to bargain with victims before deciding whether they should take a bicycle. Is a property rule preferable to a liability rule?

B. Property Rule and Liability Rule Compared, High Transaction Cost Setting

[40] Even though the damage award is never equal to the precise subjectively-measured loss suffered by a victim, it is the correct level on average. Thus, the discussion of correct-on-average damage awards by Kaplow and Shavell applies to this example. Kaplow and Shavell, supra note 8, at 726-727 (showing that correct-on-average damage awards are superior in the high transaction cost case to property rules).

[41] To simplify the analysis, I assume takers go after bicycles only for use. Otherwise, low valuing takers would take bicycles and try to sell them for the objective market value, or pay a low price and try to sell it for $75 – e.g., pay $68 sell for $75. The key conclusions of the analysis in this paper do not depend on this simplifying assumption.

I will examine property rules first. Assume the property rule favors the victim. Then takers who value the bicycle at $100 are prevented from taking the bicycle; and since transaction costs are assumed to be high, no consensual transfers will occur. As a consequence, the welfare gain forgone is the difference between the takers subjective valuation and the victim's subjective valuation. If takers choose high and low-valuing victims randomly, that difference is $25 ($100 - $75) in the case of a high-valuing taker. That is because each high-valuing taker who is forbidden from taking a bicycle forgoes a gain of $100, while the average victim, given random assignment, would have lost $75. By a similar argument, the difference is -$50 ($25 - $75) in the case of a low-valuing taker.

To simplify, assume that the numbers of high-valuing takers, high-valuing victims, low-valuing takers, and low-valuing victims are the same. Then we can consider the average gain or loss in welfare for every taking that is prevented under the property rule. When a taking is prevented, society loses on average $25 in the case of high-valuing taker and gains on average $50 in the case of a low-valuing taker, yielding an overall average gain of $25. The property rule favoring the victim results in an overall average gain (for each potential transfer) in welfare of $25, relative to a regime in which takings are permitted. To simplify the remaining discussion, I will continue to examine the welfare gain per potential transfer – or equivalently the "social dividend" – as a method of ranking the property and liability rules.

Let us switch our focus to the property rule favoring the taker – taker gets to take whenever he wants to with no punishment or liability. Now the high-valuing takers on average generate a surplus of $25 and the low-valuing takers generate an average loss in

surplus of $50. The property rule favoring the taker results in an overall loss in welfare (on an average per-transfer basis) of $25 relative to a property rule protecting victims. Of course, this is just the mirror image of the result stated for the property rule favoring the victim.[42]

Clearly, as between the two property rules (one favoring the victim and one favoring the taker), the rule favoring the victim is preferable. Of course, this result is an artifact of the initial assumptions regarding the distribution of subjective valuations. The result could easily change if we changed assumptions on the subjective valuations of the parties or of the numbers of various types.[43]

Now consider the results under liability rules. The standard liability rule awards the victim $75 when his bicycle is taken by a taker. However, as Calabresi and Melamed made clear, every liability rule contains within it a background entitlement assignment.[44] The liability rule that awards the victim $75 when his bicycle is taken implicitly assigns the entitlement to the victim. However, there is an alternative liability rule that assigns the entitlement to the taker while protecting it by a liability rule. Under the alternative liability rule, the taker has the right to take the bicycle, and the victim must pay the taker $75 to exterminate that right or to regain possession of the bicycle.[45]

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[42] It should be clear that the mirror-image results under the property rule protecting the victim and the property rule protecting the taker depend on underlying assumptions regarding the distribution of subjective evaluations. If the assumptions are changed, the ranking of the two rules could change. For example, suppose all takers value bicycles at $100. Now society loses $25 when a taking is prevented under the property rule protecting the victim. The property rule protecting the taker would allow society to realize this $25 gain, and would therefore be preferable to the property rule protecting the victim.

[43] See supra note 42.

[44] Calabresi and Melamed, supra note 1, at 1116-1122.

[45] This is the famous "Rule Four" of Calabresi and Melamed, supra note 1, at 1116-1122. For a more recent thorough discussion of Rule Four, see Krier and Schwab, supra note 6, 442-445 and 467-475; Richard Epstein, A Clear View of the Cathedral: The Dominance of Property Rules, 106 Yale L. J. 2091, 2103-2105 (1997). For frameworks expanding on Rule 4, see Krier and Schwab, supra; Saul Levmore, Unifying Remedies: Property Rules, Liability Rules, and Startling Rules, 106 Yale L.J. 2149 (1997).

To avoid analytical clutter, I will focus on the standard liability rule, i.e., the liability rule protecting the victim. For the remainder, I will refer to this as simply *the liability rule*. The alternative liability rule – i.e., the liability rule protecting the taker – will be considered in the margins.

Under the liability rule a high-valuing taker knows that if he takes a bicycle, he will be forced to pay $75 by a court.[46] His gain from taking a bicycle will be $100 - $75, so he will take the bicycle. On average, society will also gain $25 as a result, since half of the takers will value the bicycle at $85 and the other half at $65. A low-valuing taker will realize that his surplus will be $25 - $75 = -$50, so he will not take a bicycle under the liability rule. Society, as a result, gains (on average) $50 for every such taking that is deterred by the liability rule. The gain in welfare (or social dividend) from the transfers that take place and from those deterred is $25 + $50 = $75.[47] Of, course, the property rule protecting the taker permitted high-valuing takers to acquire bicycles, increasing welfare by $25. It follows that the liability rule leads to an increase of welfare over the property rule protecting takers by $50. In comparison to the property rule protecting the victim, the liability rule increases welfare by $25. Clearly, the liability rule is socially preferable to the property rule protecting the victim.

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[46] Following Kaplow and Shavell, I assume here, in order to simplify matters, that there are no enforcement costs. If enforcement or litigation costs are introduced into the analysis, the results on deterrence would have to be modified. For example, if the cost of litigation for a plaintiff were $76, no victim who valued his bicycle at $65 would find it worthwhile to bring suit. On the effects of litigation costs on deterrence, see Keith N. Hylton, The Influence of Litigation Costs on Deterrence Under Strict Liability and Under Negligence, 10 Intn'l Rev. Law & Econ. 161 (1990).

[47] As I noted before, I will consider the liability rule protecting the taker (Rule 4 of Calabresi and Melamed) in the margins. Suppose the liability rule protects the taker. This means that the taker will take and the victim can reacquire the bicycle by paying $75 to the taker. Consider what happens when in the case of a $100-value taker. Note that there is $35 potential gain when he takes from a low-valuing victim and a potential $15 gain when he takes from a high-valuing victim. However, high-valuing victims will pay $75 rather than suffer the loss, so society gains only $35 (compared to the initial allocation). Similarly, for a low valuing taker, only the taking from a low-value victim will take place, resulting in a loss of $40 relative to the starting allocation. It is therefore inferior to the liability rule protecting the victim, given the assumptions regarding the distribution of subjective valuations.

The analysis, to this point, shows that when bargaining is infeasible (transaction costs high) the liability rule protecting the victim performs better than either version of the property rule (protecting the victim or protecting the taker).[48] This analysis supports the general conclusions in the literature, beginning with Calabresi and Melamed and followed by Kaplow and Shavell. However, the result favoring the liability rule depends on assumptions made about the distribution of taker and victim types. As I will show in the next example, under a different set of assumptions one type of property rule may perform just as well as the liability rule.

However, the implications of this analysis are not entirely dependent on the specific numerical assumptions of the example studied. The general point demonstrated so far is the following:

Proposition 1: *If some takers have subjective valuations that exceed those of victims, then, in a high transaction cost setting, the liability rule is preferable to a property rule*.[49]

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[48] A more complete ranking should take into account four rules: the property rule protecting the victim, the property rule protecting the taker, the liability rule protecting the victim, and the liability rule protecting the taker. Let the symbols p_v, p_t, p^l_v, and p^l_t represent the change in welfare relative to the initial allocation for each rule. With this definition, p_v = \$0 (since it results in no change from the initial allocation), p_t = -\$25, p^l_v = \$25, and p^l_t = -\$2.5. It follows that, given my assumptions, the ranking is as follows: (1) the liability rule protecting the victim, (2) the property rule protecting the victim, (3) the liability rule protecting the taker, and (4) the property rule protecting the taker. One general conclusion suggested by this analysis is that *whenever the property rule protecting the victim is socially desirable (i.e., increases welfare) relative to the property rule protecting the taker, the liability rule protecting the victim will be preferable to the liability rule protecting the taker*. In general, the property rule protecting the victim will be desirable relative to the property rule protecting the taker when the average subjective valuation of victims exceeds that of takers. In the example considered in the text, the average valuation of victims is \$75 and the average valuation of takers is \$62.5.

[49] This is analogous to Gary Becker's result regarding optimal penalties, Becker, supra note 1. Examining the optimal criminal penalty, the Becker article shows that if the marginal gain to the offender sometimes exceeds the harm to society, the optimal penalty internalizes the losses imposed on society (i.e., the sum of the victim's harm and the cost of enforcement). See Becker, supra note 1, at 191-192. In the example considered in this paper, the liability rule is equivalent to a policy of internalization. The case of crime analyzed by Becker should be assumed to be a high transaction cost case, since Becker's model does not incorporate bargaining between potential offenders and victims.

C. Changing the Distribution of Taker Types

Suppose all takers are low-value types, placing a subjective valuation on a bicycle of $25. Is the liability rule preferable to either version of the property rule?

First, consider the liability rule. With a damage award of $75 awaiting him, no low-valuing taker will take a bicycle. This is a desirable result, because each such taking would reduce society's welfare by an average of $50. Following the approach taken earlier, I will say that the social dividend from the liability rule is $50.

Second, consider the two property rules. Under the property rule favoring the victim, no takings will occur. Thus, the property rule favoring the victim delivers a benefit of $50, just like the liability rule. Under a property rule favoring the taker, takings will occur imposing an average loss of $50 per transfer (again, the mirror image result).

In this example, the liability rule and the property rule favoring the victim perform equally well. Society should therefore be indifferent as between these two rules. There is a more general point to be made.

Proposition 2: *When transaction costs are high, and all takers have subjective valuations that fall below those of victims, a property rule favoring the victim delivers the same benefits to society as would a liability rule*.[50]

One might argue that the liability rule is clearly preferable as a general matter in the high transaction cost case because it delivers the best results no matter what

[50] This is analogous to Becker's result, in the crimes context, that a penalty that completely deters crime is appropriate when the marginal gain to offenders is always less than the marginal harm to society, see Becker, supra note 1, at 191. A penalty that completely deters offenses is equivalent, in effect, to a perfectly functioning property rule protecting the victim.

assumptions are made regarding the distribution of taker types. If some takers have valuations that exceed those of victims, the liability rule maximizes social welfare; and if no takers have valuations that exceed those of victims, the liability rule still maximizes social welfare. Indeed, this is the core reason why Gary Becker argued in favor of internalization of victim losses as a general approach toward criminal punishment.[51]

However, even though the liability rule has the property of delivering the efficient result irrespective of the distribution of takers' subjective valuations, society may have reasons to prefer a property rule when takers' subjective valuations are clearly less than those of victims.

First, the property rule delivers a clearer message to victims and takers. Rather than having to determine whether his subjective valuation is likely to be less than that of the victim, the taker receives a simple, clear message under the property rule regime: "don't take".[52] This avoids wealth-diminishing takings (where the taker's subjective valuation is less than the victim's) that might occur under a liability rule because of misperception or ignorance[53] on the part of the taker.[54]

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[51] For the original argument, see Becker, supra note 1. For discussion, see Keith N. Hylton, Punitive Damages and the Economic Theory of Penalties, 87 Geo. L. J. 421, 424-430 (1998).

[52] Hume noted the importance of the clear message provided by property rules. David Hume, Treatise of Human Nature 484-501 (Prometheus Books 1992) (1737).

[53] Admittedly, introducing misperception violates the "perfect information" assumption adhered to up to this point in the text. However, since the perfect information assumption is unlikely to be satisfied in full in the real world, it makes sense to consider when the liability rule imposes significantly greater informational requirements than the property rule (and conversely).

[54] Whence might such misperceptions derive? Suppose low-valuing takers see high-valuing takers profiting from their takings. They might mistakenly conclude that taking is profitable in general, even though it would not be for them. Or, suppose takers have difficulty discerning cases in which short run gains are outweighed by long run losses. See, e.g., Guido Calabresi, The Costs of Accidents: A Legal and Economic Analysis 55-60 (Yale Univ. Press, 1970) (describing Faustian bargain problem as distortion from rational behavior). Yet another example of a possible source of misperception is the inability to put gains and losses into a common currency. It was this difficulty that led Bentham to propose that punishments have some feature similar to the crime they were designed to deter. Bentham said that in order to encourage the potential offender to take his prospective penalty into account before committing an offense, a punishment should have some "characteristic" relating it to the offense. See Jeremy Bentham, The Principles of Morals and Legislation 192 (Amherst: Prometheus Books, 1988)(1781) (Punishment cannot

Second, property rule protection takes advantage of the state's investment in an enforcement infrastructure for its criminal laws. Any reasonably advanced state will enact criminal laws and devote public resources toward enforcing those laws. Extending property rule protection to those cases in which takers' subjective valuations are all less than those of victims allows the state to make a fuller use of its existing enforcement infrastructure. And to the extent criminal law violations will also involve instances of takings, where takers' valuations fall below those of victims, property rule protection leads to a more productive use of enforcement agents.

Third, there are many instances in which the amount that should be awarded in liability is difficult to determine, and given this difficulty, it is more efficient to simply prohibit the taking when it is almost surely a drain on society's wealth.[55] For example, intentional takings that involve physical injury probably would fall in this category.

D. Summing Up: High Transaction Costs Case

In general, when transaction costs are high, the liability rule is preferable to the property rule. This result is, of course, the same as that in Calabresi and Melamed and Kaplow and Shavell. However, when takers have subjective valuations that are quite likely to be well below those of victims a property rule works just as well as a liability rule, and may be preferable on many grounds. This latter conclusion distinguishes the

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act any farther than in as far as the idea of it, and of its connection with the offence, is present in the mind. The idea of it, if not present, cannot act at all … Now, to be present, it must be remembered, and to be remembered it must have been learnt…When this is the case with a punishment and an offence, the punishment is said to bear an *analogy* to, or to be *characteristic* of, the offence.).

[55] Even if administrative costs are zero, and even if there is no misperception or ignorance on the part of takers or victims, the case in which the amount of the victim's harm is difficult to determine raises deterrence issues under the liability rule. The argument follows that of footnote 53.

high-transaction cost examination here from that of both Calabresi and Melamed and Kaplow and Shavell. These conclusions have implications for law (particularly criminal law) that will be addressed later in this paper.

E. Market Available: Low Transaction Costs

Now let us assume that transaction costs are low. The taker can easily bargain for and purchase a bicycle from the victim, rather than take it from him. Specifically, assume that the costs of such a transaction amount to $0 for each party. If a high-valuing taker purchases a bicycle, his surplus will be $100 less the price he pays for the bicycle. The surplus to the potential victim is equal the price he receives less his reservation price (the subjective valuation).

In the discussion that follows, I will examine the bargaining process and state the outcomes under each scenario (e.g., low-valuing victim bargains with high-valuing taker, high-valuing victim bargains with high-valuing taker, etc). After setting out the outcomes, I will draw conclusions on the relative desirability of property and liability rules. The reader who cares not to work through the details of this analysis can skip directly to the statements of the outcomes and the following conclusions.

1. Bargaining Under Property Rules

First, consider the property rule (or rules). The property rule protecting the victim forbids the taker from taking the victim's bicycle. If the taker wants the bicycle, he will have to bargain for it. For a low-valuing taker, one whose subjective valuation is

only $25, the voluntary trade will not be attractive. He will be forbidden from acquiring a bicycle. For the high-valuing taker, his surplus from a trade is *$100 minus the (final) price demanded by the victim*. For the victim, his potential surplus from trade with a high-valuing taker is the price demanded minus his subjective valuation (either $85 or $75).

Suppose the victim is a high-valuing type, which means his subjective valuation is $85. Since the taker's potential surplus is $100 minus the price demanded by the victim, and the victim's potential surplus from a trade is the price demanded by the victim minus $85, a deal is possible for any price demand less than $100 and greater than $85. In other words, the *contract zone*, in a bargain between a high-valuing taker and high-valuing victim, is the set of prices between $100 and $85. The same argument allows us to see that between a high-valuing taker and low-valuing victim, the contract zone is from $65 to $100. Because of the perfect bargaining assumption, deals will always be reached when and only when the contract zone is non-empty.

The outcome under the property rule protecting the victim is as follows. Prices will be exchanged and only high-valuing takers will acquire bicycles, and they will do so through voluntary trades. Moreover, those trades will allow each victim to receive an amount that is at least as great as their current subjective valuations.

The outcome under the property rule protecting the *taker* is as follows.[56] Prices will be exchanged in cases involving low-valuing takers (victims paying takers), allowing

[56] I said earlier in this paper that I will analyze this case in the margins. Under a property rule protecting the taker, victims will have to pay the taker in order to keep their bicycles. A high-valuing taker will demand a price of $100, because for any lower price he would prefer to take the bicycle. A low-valuing taker will demand a price of at least $25 (assuming, recall, that he wants the bicycle for his own use and not to sell it on the market). The high-valuing victim will offer a price less than $85, while the low-valuing victim will offer a price less than $65. Any case involving a victim and a low-valuing taker will result in contract zone between $25 to $65 or in a contract zone from $25 to $85. The contract zone in any case involving a high-valuing taker is empty, so they will simply take the bicycles they desire.

victims to keep their bicycles. Because of these price exchanges, no low-valuing taker will acquire a bicycle. High-valuing takers will acquire bicycles, and they will do so by taking. The reason is that the contract zone in a bargain involving a high-valuing taker is always empty under the property rule protecting the taker (no victim is willing to pay $100 to keep his bicycle).

2. Bargaining Under the Liability Rule

Now let us consider the liability rule. A low-valuing taker will not take under the liability rule. If he wants a bicycle, he will have to pay for it, and since his valuation is only $25, he will not bid for a bicycle. A high-valuing taker will take the bicycle since he gets a surplus of $100 - $75 = $25. However, a high-valuing victim can pay for the right to keep his bicycle, since transaction costs are low. Since the bicycle is worth $85 to him, and he will receive $75 in compensation if it is taken, he will offer some price less than $10. The contract zone is empty in this case, because the taker demands at least $25 and the victim will pay no more than $10. In the case of a low-valuing victim, the high-valuing taker will realize that it is better to pay something between $65 and $75 and acquire the bicycle through a trade.[57] This would be preferable to him to a taking which would lead to a liability of $75.

The outcome, under the liability rule, is that high-valuing takers will take bicycles from high-valuing victims and purchase them from low-valuing victims. Note that this is the same final allocation observed under the two property rules, and it is the

[57] It is also possible for the victim to offer a payment to induce taking, since his liability award will exceed the valuation the victim places on the bicycle. For example, suppose the victim offers $5 to the taker to induce him to take the bicycle. The surplus to the high-valuing taker is $25 + $5 = $30. The victim gains from theft since he loses something he values at $65 and is awarded with a judgment of $75. In this scenario, the overprotection of subjective valuations leads to unnecessarily, fraudulent litigation.

efficient or wealth-maximizing allocation. The key differences observed among the rules appear in the direction of wealth transfers. This invariance of final allocations is entirely consistent with the Coase theorem, which holds roughly that when transaction costs are low the efficient allocation will be realized whatever the legal rule.[58]

This analysis agrees with that of Kaplow and Shavell to the extent it finds that the efficient outcome is realized under every arrangement – a liability rule, a property rule protecting the victim, and a property rule protecting the taker.[59] Kaplow and Shavell concluded that the outcome is efficient under every rule, and therefore there is no reason to prefer property rules over liability rules when transaction costs are low (and the parties are informed, as in this case).[60] This conclusion contradicts that of Calabresi and Melamed, since their discussion implies that property rules are preferable to liability rules when transaction costs are low.

Since we generally do not see property rules protecting takers,[61] let us confine our discussion to the liability rule and the property rule protecting the victim. In spite of what this analysis shows about the efficiency of the final outcome, there is one very important difference between the property rule protecting the victim and the liability rule. *Only under the property rule protecting the victim are victims' subjective valuations*

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[58] Coase, supra note 35.
[59] Kaplow and Shavell, supra note 8, at 733-734.
[60] Id.
[61] A property rule protecting the taker would permit the taker to take without facing any punishment from the state or liability to the victim. Perhaps the closest examples in the law are "information torts" such as defamation and intentional infliction of emotional distress. The legal standards for such torts place such high burdens in front of plaintiffs that they operate in effect as property rules protecting injurers. This is arguably efficient, because information dissemination provides external benefits to society. The law in these areas effectively give "takers" (information providers) the right to injure in the ordinary course of their activities, save in the relatively infrequent case in which it can be shown that they set out with an intent to injure a specific person.

protected. Recall that under the liability rule, takings occurred and the high-valuing victim received $75 in compensation, while losing a bicycle he valued at $85.[62]

The failure of the liability rule to protect subjective valuations is a serious flaw. It was identified by Calabresi and Melamed. The Kaplow and Shavell analysis does not explicitly incorporate victims' subjective valuations and for this reason fails to identify this flaw in the liability rule regime.[63] However, it is this flaw that provides the basis for preferring the property rule protecting the victim to the liability rule.

F. Enforcement and Administrative Costs

The preceding analysis has examined a case in which takers and victims are informed as to the valuations each party puts on the property subject to taking, and also considered the cases in which transactions are costly and in which transactions are cheap. The key findings were: first, similar to that of Kaplow and Shavell, the efficient allocation is realized under either the liability rule or the property rule; and second, the liability rule, unlike the property rule protecting the victim, fails to protect the subjective valuations of high-valuing victims. The second finding distinguishes the foregoing analysis from that of Kaplow and Shavell, and provides the basis for arguing that society should prefer the property rule protecting the victim to the liability rule. In other words, the second finding lays the groundwork for restoring the initial conclusion of Calabresi

[62] The low-valuing victim gains $75 and loses a bicycle he values at $65, so he actually gains from theft. If their gains could be transferred to high valuing victims, there would no losses under the liability rule. But I assume such a transfer would be infeasible.

[63] The Kaplow and Shavell analysis, at least in their mathematical appendix, is sufficiently general to apply to the case of subjective valuations. Their decision not to analyze or discuss the underpayment (and sometimes overpayment) of subjective valuations may have reflected a view that the issue was not important.

and Melamed. In this part, I will launch the first stage of the argument restoring Calabresi and Melamed by introducing enforcement (or administrative) costs.

Enforcement costs are incurred whenever a taking occurs and some administrative process must be put into effect in order to impose a liability assessment on the taker and transfer that sum to the victim. The administrative process could be one of public enforcement, in which a government official fines the taker and transfers the fine to the victim, or one of largely private enforcement, in which the victim has to go to court to seek compensation. Under either scenario, the administrative process is likely to consume some of society's resources.[64]

Assume, then, that whenever an enforcement action occurs under the liability rule, society incurs a cost of $10. To take a concrete illustration, suppose enforcement occurs through private litigation. Litigation is costly because the parties have to hire lawyers, the lawyers have to research their cases, and courts have to devote substantial time and resources to the hearing and resolution of a dispute. To simplify, I will assume that this $10 enforcement (or litigation) cost is borne by society as a general government expenditure.[65]

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[64] One might think that in the case of largely private enforcement, the enforcement cost might be zero because all suits for compensation should settle. However, the private enforcement regime requires some public expenditure on courts. And settlements happen only because of the real threat that the dispute will be taken into court. Since it is costly to maintain courts, and their purpose is to ensure that the liability rule is enforced, the costs of court maintenance should be viewed as part of the enforcement cost. Thus, even in a regime of private litigation in which all cases settle, the enforcement cost of the liability rule remains positive.

[65] Suppose instead that the $10 is borne by the victim/plaintiff. This complicates matter because victims whose losses are less than $10 will have no incentive to bring suit, which in turn weakens deterrence. Thus, if the litigation cost is borne entirely or in part by the victim, then the cost of litigation itself will reduces social welfare and the deterrence-weakening effect will reduce social welfare further. On the welfare effects of costly litigation, see Keith N. Hylton, Welfare Implications of Costly Litigation under Strict Liability, 4 American Law and Economics Review 18-43 (2002); A. Mitchell Polinsky and Daniel L. Rubinfeld, The Welfare Implications of Costly Litigation for the Level of Liability, 17 J. Legal Stud. 151-64 (1988).

First, consider the property rule favoring the victim. Recall that all bicycle trades occur through voluntary bargains. The social dividend from each transaction will be $100 - $85 ($15) in half of the trades and $100 - $65 ($35) in the other half. The average social dividend is simply $25 per transaction.

Next, consider the liability rule. Recall that high-valuing takers take bicycles from high-valuing victims and purchase them from low-valuing victims. High-valuing victims whose bicycles are taken bring lawsuits for compensation. On average the social dividend from these transactions is $100 - $85 - $10 = $5 per transaction. In the voluntary transactions, the social dividend is $100 - $65 = $35. The average social dividend is $20 per bicycle transfer. This is clearly lower than the social dividend per transfer under the property rule favoring the victim.[66]

The liability rule is inferior to the property rule favoring the victim. The reason is that the liability rule fails to protect the subjective valuations of some victims, and this gives them an incentive to sue for compensation. Their lawsuits impose a tax on society in the form of litigation and administrative costs. The property rule protecting the victim is preferable to the liability rule because it forces takers to use the market, which is a much cheaper method of transferring property than one that requires the intervention of courts.

Introducing enforcement and administrative costs into the analysis, coupled with the basic flaw that liability rules do not protect subjective evaluations, returns us to the

[66] It is important to observe that this result differs from that of Kaplow and Shavell. Under their analysis, takings do not occur under the liability rule because of the perfect information and Coasean bargaining argument. As a consequence, introducing enforcement costs into their analysis does not clearly change its conclusions.

position initially taken by Calabresi and Melamed. Property rules are preferable to liability rules when transaction costs are low.

G. Denormalization Costs

Bentham referred to "secondary costs" as a category including the general incentive effects created by takings[67] – e.g., the "deadening of industry".[68] Michelman refers to the same problem with the narrower though more communicative term "demoralization costs".[69] The category of secondary costs can also include expenditures on protection or avoidance,[70] and any other expenditures made in anticipation of a possible taking, including those made by the potential taker. Thus, the reduction in incentives to produce that would normally occur as a result of rampant theft is only one component within the general category of secondary costs.

Because the term "secondary costs" fails to communicate the nature of the problem, I will group all of these costs under the title *denormalization* costs. Since normalization usually implies a stabilization of some arrangement, denormalization implies destabilization, which is what occurs when property rules are not respected.

Denormalization costs are realized, in this analysis, because the liability rule fails to protect subjective valuations. Knowing that a taking will result in a non-compensable loss of $10, high-valuing victims will have less incentive to invest in the upkeep of their

[67] Jeremy Bentham, The Principles of Morals and Legislation, at 153.
[68] Bentham, Security and Equality, supra note 4, at 54 (discussing 'evils which result from violations of property".)
[69] Michelman, supra note 14.
[70] Becker, supra note 1, at 171 (presenting table showing some private outlays on avoidance, such as security guards and alarms, amounting to roughly $2 billion in 1965).

bicycles. Alternatively, they will have a greater incentive to invest in locks and protective technology.[71] Potential takers, on the other hand, will have a greater incentive to invest in the technology of taking. These incentives are created by the risk of a taking that leads to an uncompensated loss.

Imagine summing all of these incentive costs into a large lump sum and dividing them up on a per transfer basis. Think of what this would do to the social divided per transfer under the liability rule. It is quite likely that on a per transfer basis these costs would be substantial, and quite a bit larger than the cost of conducting a transaction.[72] As long as the transaction cost is less than the per transfer denormalization cost, society should prefer the property rule protecting the victim to the liability rule.[73]

This leads to the last conclusion for the case in which bargaining is feasible and information perfect:

Proposition 3: *When transaction costs are low, the property rule protecting the victim is preferable to the liability rule*.

H. Reexamining the Case of No Subjective Valuations

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[71] Posner, discussing the implications of the Kaplow and Shavell article, mentions the greater precautionary incentives of property holders whose harms would not be fully compensated by the damage remedy. Posner, Economic Analysis of Law, supra note 13, at 69.

[72] Suppose litigation is costless, so the only costs that we need consider now are denormalization costs. Let the per-transfer denormalization cost be X. Finally, suppose a liability rule is in effect. When a high-valuing victim loses a bicycle from theft to a high-valuing taker, the change in welfare is \$100 - \$85 – X = \$15 – X. When a transaction takes place with a low-valuing victim, the social dividend is \$100 - \$65 = \$35. On average, then, the social dividend is \$25 – X/2. For any positive X, this is clearly less than the social dividend per transfer under the property rule (\$25 in this example). Of course, if transactions have a positive cost (though still low), one should compare the per-transfer denormalization cost X to he per-transfer transaction cost.

[73] See Richard L. Hasen & Richard H. McAdams, The Surprisingly Complex Case Against Theft, 17 Int'l Rev. L. & Econ. 367 (1997) (if cost of disincentive effects outweighs transaction cost, prohibition is optimal). See also Fred S. McChesney, Boxed In: Economists and the Benefits from Crime, 13 Int'l Rev. L & Econ. 225 (1993); Keith N. Hylton, The Theory of Penalties and the Economics of Criminal Law, Review of Law and Economics, forthcoming, 2005.

What should we say of an analysis that excludes explicit consideration of victims' subjective valuations? Should one be entirely confident of the conclusion, suggested in the literature and in the foregoing discussion,[74] that society should be indifferent as between the property rule and the liability rule when transaction costs are low (and information perfect)? There are reasons to be wary of accepting even this conclusion.

Return to the example discussed in the previous parts, and suppose there are no subjective portions of value on the victim's side. In other words, there are no high-valuing or low-valuing victims; each victim places the same valuation of $75 on his bicycle. Much of the preceding analysis goes through as before. However, consider the case of a high-valuing taker bargaining with a victim. The high-valuing taker could take the bicycle and pay damages, which gives him a payoff of $100 - $75 = $25. Alternatively, the high-valuing taker could bargain and pay $75 for the bicycle, giving him the same payoff.

If, as I assumed earlier, the state bears the cost of enforcement or litigation, the high-valuing taker is indifferent between taking and purchasing at $75. No subjective valuations are expropriated under either approach. Given that each taker is indifferent as between taking and paying, some will take and some will pay $75. Where high-valuing takers take, victims will bring suit, again forcing society to bear the enforcement costs. The property rule is preferable to the liability rule.

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[74] The Kaplow and Shavell article, as I noted earlier, presents a model that does take subjective valuations into account. However, their analysis, and that of the new bargaining theory literature generally, does not explicitly take up the problem of protecting subjective valuations.

This example shows that even if subjective valuations are not expropriated, if any takings would occur under the liability rule, the property rule is socially preferable to the liability rule. The reason is that takings lead to costly enforcement (e.g., litigation), which taxes society's wealth. But the example relies on two assumptions that should be relaxed: that the state bears the cost of litigation and that the victim settles for the objective market value of $75.

Let us consider what happens under the assumption that the cost of litigation is shared between the taker and the victim. Suppose the total cost of litigation is split evenly, with the taker paying $5 and the victim paying $5 in litigation expenses. The high-valuing taker gets a surplus of $20 if he takes and pays damages ($100 - $5 -$75). This implies that if the victim tries to demand more than $80 for the bicycle, the taker will simply take it. It follows that the contract zone under the liability rule is the set of exchange prices between $75 and $80.[75] Recall that the contract zone under the property rule is between $75 and $100.

As this example suggests, if victims' subjective valuations are equal to the objective market value of $75, k is the cost of litigation, and γ the share of the total litigation cost borne by the taker, the contract zone under the liability rule is the set of prices greater than or equal to $75 and less than or equal to $75 + (1- γ)k. Clearly, whenever the share of the total litigation cost borne by the taker is zero, he is indifferent between taking and bargaining, so takings may occur, taxing society's wealth. However, if the taker bears some share of the total litigation cost, he can do better by bargaining

[75] Note that if the taker takes the bicycle, the victim loses $5. This suggests that the taker could drive the exchange price down almost to $70. In other words, the contract zone under the liability rule could change to the range of prices between $70 and $80. However, this assumes strategic behavior, which is ruled out at this stage, because I am assuming perfect bargaining.

rather than taking. Under the perfect bargaining assumption adhered to so far, there will be no takings, no expropriations of subjective value, and no litigation.

One might conclude, then, that when victims' subjective valuations are the same as the objective market value, as long as the taker bears some part of the litigation or enforcement cost, he will prefer to bargain and takings will not occur. It would seem to follow from this that under these conditions the liability and property rules lead to the same results in terms of social welfare.

However, this rather narrow, special-case conclusion favoring the liability rule is invalid for two reasons. The first is the problem of *cognitive dissonance* (or, perhaps more broadly, bounded rationality),[76] and the second is *investment incentives* (or denormalization costs, again). To see the cognitive dissonance problem, return to the case in which the total cost of litigation is split evenly, so the taker will prefer to take whenever the victim's price demand exceeds $80. The victim may think that if a taker approaches him with a price offer of $75, that the taker is committed to bargaining, so he may as well respond with a counter-offer of $85. Anticipating that some victims might respond to an offer with a counter-offer, the high-valuing taker may decide that he should

[76] Leon Festinger, A Theory of Cognitive Dissonance (Stanford: Stanford University Press, 1957); George A. Akerlof and William T. Dickens, The Economic Consequences of Cognitive Dissonance, 72 American Economic Review 307-319 (1982). Cognitive dissonance results when an agent chooses an action and then develops certain hypotheses to justify that action. He then continues to adhere to those hypotheses even when the evidence goes against them. In the example in the text, a victim who chooses to bargain with a taker may continue to adhere to his starting-point hypothesis even when his demand price has gone up to $80. But at that point, he is no longer a bargainer in the eyes of the taker, he is an imminent victim of a taking. Admittedly, this violates the perfect information assumption that I have adhered to so far, but (as I noted in footnote 53) it is entirely reasonable to consider when one rule (liability or property) imposes significantly greater informational burdens than the other.

never bargain, simply take in every case.[77] That leads to litigation, again costing society. Once gain, the property rule is preferable to the liability rule.

The other reason to reject the conclusion that property rules and liability rules are equivalent when victims' subjective valuations are all the same as the objective valuation is because of investment incentives. Again, suppose the total cost of litigation ($10) is split evenly between taker and victim. Assume each victim, in order to avoid takings and litigation, demands no more than $80 for the bicycle. Transfers occur without takings, and no litigation costs are realized. In this case, the property rule does not appear at first glance to be preferable to the liability rule. However, the reason this is so is that the victim is, in essence, bullied by the law into accepting a price of no more than $80 even though he knows that the taker enjoys the lion's share of the entire bargain surplus. In effect, the liability rule sets up conditions under which the victim is forced to give up almost all of the bargain surplus to the taker. To call such an outcome efficient is shortsighted, for the reason that follows.

In the scenario in which all victims sell at $75, avoiding litigation costs, no victim gets to seek to share in the bargain surplus. But the prospect of sharing in the bargain surplus is widely considered to be one of the benefits of ownership. The property rule allows possessors to make investments in anticipation of eventually sharing in the bargain surplus from a sale in the future.[78] The liability rule, in contrast, encourages

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[77] The general point here is that the liability rule requires the victim to process a great deal of information in order for perfect bargaining to occur. The victim has to calculate when his price demand hits the point at which the taker will quit the bargaining table and resort to a taking. Boundedly rational agents are unlikely to be able to process so much information. In contrast, the property rule requires far less information in order to conduct perfect (or successful) bargaining.

[78] Consider, for example, the sale of a house. Suppose the market value of the house, based on local comparables, is $100,000 (and this is also the owner's subjective valuation). However, there are many instances in which an owner makes investments into property that do not result in an increase in the market value of the property. Suppose, for example, the owner develops a beautiful garden. The owner may know

takers to make investments in anticipation of eventually consuming virtually the entire bargain surplus from future transactions. Takers will anticipate getting virtually the entire bargain surplus because the threat of a taking will loom like a brandished sword over every transaction. This encourages more people to become takers over time, and long-time takers to invest more into the absolutely unproductive technology of taking.[79] Given these long-term investment incentives, the property rule is preferable to the liability rule.[80]

IV. Transactions, Imperfect Information, and Bargaining Failure Generally

The foregoing discussion has examined the perfect bargaining case in which the cost of meeting to bargain is low, the subjective valuations of takers and victims were known by all parties as well as all other information necessary to reach agreement, and

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that the average buyer may not be willing to pay more for a house with a beautiful garden, but that there is also a subset of potential buyers who will bid above the market for such a property. Under the property rule, the owner can invest in his garden, knowing that he may be able to share in the bargain surplus if a potential buyer who loves gardens comes along. This example suggests that the property rule leads to efficient matching that fails to occur under the liability rule, and this efficient matching supports investment incentives.

[79] Consider, for example, a state that uses the power of eminent domain to transfer property from one private party to another for a "private" use, such as a shopping mall. Kelo v. New London, 545 U.S. __ (2005). Shopping mall developers would have incentives under this liability rule regime to search for private parcels that could be efficiently developed, and to lobby government officers to gain their support in the transfer process. The investments in the lobbying process are pure rent-seeking expenditures, investments into the technology of taking, and one should expect those expenditures to increase following the *Kelo* decision.

[80] Indeed, in a regime in which takers always enjoy the entire bargain surplus, one would imagine that victims would attempt to find a way to opt out of the regime entirely or to retaliate against perceived injustices. One long-standing theory of the purpose of damage awards is to secure peace, by reducing the incentive of victims to retaliate against injurers. See Adam Smith, Lectures on Jurisprudence (R.L. Meek et al. eds., Oxford Univ. Press 1978)(1762-66) 106-110. But in order to secure peace in the property context, damage awards should protect potential victims from expropriation. As I have suggested, there are unavoidable denormalization costs that are associated with the liability rule. The only way to avoid these costs is to have a setting in which the subjective valuations of both takers and victims are equal to the objective market value. But in that peculiar special case, there would be no incentive for trade. In short, the Kaplow-Shavell analysis collapses to a pinpoint.

there is no strategic behavior. Bargaining is always successful in this case, in the sense that the parties always reach an agreement.[81] In this part I will briefly consider the imperfect information case in which the subjective valuations of takers and victims are private information. In other words, a taker bargaining with a victim for his bicycle may not know the victim's subjective valuation, and the victim may not know the taker's subjective valuation. In the imperfect information setting, bargaining may be unsuccessful or fail, in the sense that the parties fail to reach an agreement.

The bargaining theory literature, especially the contribution by Kaplow and Shavell, has extended the analysis of Calabresi and Melamed by looking carefully at the bargaining process, especially the imperfect information case. As I noted in the last section, bargaining theory implies that property rules and liability rules are equivalent when transaction costs are low (and information perfect) – though, as I have also noted, the Calabresi-Melamed preference for property rules is restored when the costs that result from failing to protect subjective valuations are taken into account. In the imperfect information setting, the bargaining theory literature reaches an ambiguous conclusion: it is not clear that the property rule is preferable the liability rule.[82]

I will offer here a brief informal account of the Kaplow and Shavell analysis of the imperfect information case, for two reasons. The first is to help support my claim that the property rule protecting the victim is preferable to the liability rule when transaction costs are low. The second reason is to set up the basic analysis of imperfect

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[81] The complete information case assumes that there are no costs that prevent people from meeting to bargain, and no informational or incentive impediments to bargaining. Given these assumptions, as long as there is a (non-empty) set of potential mutually-beneficial allocations that the parties can find, it is assumed that they will find an allocation within that set through the bargaining process.

[82] See generally Ayres and Talley; Ayres and Goldbart; Kaplow and Shavell, supra note 8, at 735.

information, though informally, in order to return to it when examining the positive implications of this paper's analysis.

Consider the case of uniform victim valuations of $75, and two types of high-valuing takers with valuations of $100 and $80, and one type of low-valuing taker with a value of $25. The efficient outcome is one in which the high-valuing takers acquire bicycles and the low-valuing takers do not. Suppose there is a property rule protecting the victim. Suppose bargaining occurs with the victim making a take-it-or-leave-it demand.[83] The victim, not knowing which sort of taker he faces may choose to make a demand of $99, taking his chance that the large surplus he earns from deals with takers who value the bicycle at $100 will outweigh the lost opportunities for trade with takers who value the bicycle at $80.[84] As a result, some bargains will fail involving takers who value the bicycle at $80. The efficiency loss is equal to the number of such failed bargains multiplied by the forgone surplus of $5 ($80 - $75).

Trades must take place under the liability rule too in order to reach efficient outcomes. Suppose now that the victims' subjective valuations are $100 and $50, leading to an average used for liability purposes of $75. There are two types of taker, one with a valuation of $80 and the other with a valuation of $95. It would be inefficient for either of these takers to acquire the bicycle of the victim whose valuation is $100. Yet, the liability rule gives them an incentive to try. Given this incentive, the high-valuing victim

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[83] See Kaplow and Shavell, supra note 8, at 732.

[84] To be precise, the victim has a choice to make one of two demands: he can make a demand of $99 or a demand of $79. If the victim demands $99, only the $100-value takers will accept the bid, giving the victim a gain of $24 from the deal. If he demands $79, all high-valuing takers will accept the bid (both the $80-value and the $100-value takers), giving the victim a gain of $4 in each deal. Suppose for example, the proportion of $100-value takers among the group of high-valuing takers is 40 percent. The payoff to the victim from demanding $99 is (.4)($24) = $9.6. The payoff from demanding $79 is $4. Since in this case the payoff from demanding $99 exceeds that from demanding $79, the victim will demand $99. In general, in this example, if the proportion of $100-value takers (among the group of high-valuing takers) exceeds 16.7 percent, the victim will make the $99 demand.

has a corresponding incentive to offer a payment to the takers in exchange for a commitment not to take. Suppose, then, the high-valuing victim makes a take-it-or-leave-it offer of $6,[85] in the hope that the surplus enjoyed from these bargains will outweigh the loss from failed bargains.[86] Again, there will be failed bargains and inefficient takings will occur.

Without having firm notions of the frequency of inefficient outcomes and the social cost of each one, it is impossible to say whether the efficiency losses are greater under the property rule or under the liability rule. Hence, Kaplow and Shavell's *ambiguity proposition*: the property rule and the liability rule cannot be ranked in terms of welfare when transaction costs are low and information imperfect. This conclusion is also implied by the Ayres and Talley analysis – and for this reason should be taken as a central claim of the new bargaining theory literature.

There are two responses to the bargaining theory literature's proposition that property rules and liability rules cannot be ranked in welfare terms in the imperfect information setting (i.e., the ambiguity proposition). The first is that it is not clear at all that the ambiguity proposition contradicts Calabresi and Melamed. The second is that the law itself has responded to the ambiguity problem in various settings, sometimes by modifying the property rule, and in others by choosing the liability rule over the property

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[85] Note that if the high-valuing victim offers the taker $6 to the $80-value taker, he will agree not to take the bicycle. Why? If he takes the bicycle, he gets a bicycle worth $80 to him, but must pay a damage award of $75, leaving him a surplus of $5. He is better off accepting $6 and agreeing not to take the bicycle. On the other hand, the $100-value taker would get a surplus of $25 from the theft, so he would not accept an offer of $6 in exchange for an agreement not to take.

[86] To be precise, the high-valuing victim has a choice of two offers: $6, allowing the victim to enjoy a surplus of $19 on each trade with an accepting taker (because without such an offer he loses $25 each time), or $21, allowing him to enjoy a surplus of $4 on trades with every taker (since all would accept in this example). Note that when a taker rejects his offer, the victim loses $25 (because the taker takes the victim's bicycle). Suppose the proportion of $100-value takers is 90 percent. Then the strategy of offering $6 has an average payoff of (.9)($19) + (.10)(-$25) = $14.6. The strategy of offering $21 has an average payoff of $4. Given this, the high-valuing victim will offer $6, because the gain from making deals with a large surplus outweighs the loss from forgone trades.

rule. In other words, where bargaining failure is a serious problem – because of information or incentive impediments – the law has responded to the problem by deviating from the simple property rule protecting the victim.

Let us first examine the extent to which the ambiguity proposition contradicts the general claim of Calabresi and Melamed that the property rule is preferable to the liability rule when transaction costs are low. The proposition appears to contradict Calabresi and Melamed at first glance. However, one could easily argue that imperfect information is just a type of transaction cost, so that the incomplete information case should be considered one of high transaction costs. Indeed, Calabresi and Melamed note early in their article that the "no transaction cost" case should be understood as the case involving "both perfect knowledge and the absence of any impediments or costs of negotiating".[87] To introduce information imperfections to the analysis, as the new bargaining theory literature does, is to immediately step away from the assumptions Calabresi and Melamed attached to the low transaction cost scenario.

Moreover, the ambiguity proposition itself is arguably implied by Calabresi and Melamed's discussion. Consider, for example, Calabresi and Melamed's discussion of the hold-out problem in property transactions.[88] The hold-out problem is an example of a setting in which bargains fail under conditions that are quite similar to the imperfect information setting – in the sense that the cost of meeting to bargain is low but the likelihood of bargaining failure is high. The hold-out problem occurs when one party is trying to purchase several parcels from a group of land owners. Suppose, for example, there are ten parcels of land owned by different individuals, each of whom places a value

[87] Calabresi and Melamed, at 1095.
[88] Id. at 1106-1108.

of $1000 on the parcel. A town or municipal corporation realizes that a park made up all ten parcels would provide a total benefit of $100,000 to its residents.[89] One or more landowners may have an incentive to hold out for a substantial share of the entire bargaining surplus ($90,000). If the hold-out problem is severe, transactions of this sort will fail. The law responds to the hold-out problem by replacing the property rule that would ordinarily apply with a liability rule known as eminent domain.[90]

Calabresi and Melamed's discussion of the hold-out problem suggests that the eminent domain rule is an appropriate (or welfare-enhancing) alternative to the property rule when the hold-out problem is likely to be substantial, and otherwise not.[91] In other words, their discussion suggests that the property rule protecting the victim and the liability rule cannot be unambiguously ranked in terms of welfare in the presence of the hold-out problem. Since the hold-out and imperfect information cases are analytically homologous, in the sense that both involve settings in which the cost of meeting is low but the likelihood of bargaining failure substantial, the ambiguity proposition is implicit in the Calabresi and Melamed analysis.

This is a good place to generalize the argument. There are three settings in which the cost of actually meeting to bargain is low but the likelihood of bargain failure high. One is the imperfect information case examined in the bargaining theory literature. Another is the hold-out and free-rider case examined by Calabresi and Melamed. A third is the case in which the entitlement itself is difficult to define, which we observe in the

[89] This example is similar to that discussed in Calabresi and Melamed, supra, but I have changed the numerical assumptions.
[90] Id.
[91] Id.

nuisance context.[92] We can put all of these cases under a general category of *intermediate transaction costs*. This distinguishes these cases from the high transaction cost setting, in which the parties generally find it infeasible to even negotiate, and from the traditional low transaction cost setting in which parties generally can reach an agreement. In the intermediate transaction cost setting, we find that liability rules are sometimes preferable to property rules.

Now let us consider the implications of intermediate transaction costs (imperfect information, hold-outs, indefinite entitlements) for the more general argument of this paper. Intermediate transaction cost analysis gives us no reason to prefer the liability rule over the property rule as a general matter. It therefore follows that incorporating this analysis does not change the basic conclusion of the foregoing examination. The property rule (protecting the victim) is preferable to the liability rule because it protects subjective valuations, and because it does so it avoids the enforcement and denormalization costs that would be observed under a liability rule regime. Introducing intermediate transaction cost cases to the analysis provides no clear reason to overturn this conclusion. Where the inefficiencies resulting from bargaining failure are relatively mild or infrequent, society clearly should put more weight on the subjective valuation protecting function of property rules.[93] On the other hand, where the inefficiencies from bargaining failure are relatively severe, society can replace the property rule with the liability rule (or some modified version of the property rule) in order to avoid the social costs of bargaining failure.

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[92] Merrill, supra note 7.

[93] What matters most here is the ratio of the cost of bargaining failure and the cost of failing to protect subjective valuations. If the ratio is close to one – say because both costs are high – there is no reason to replace the property rule with a liability rule. Indeed, in many instances in which bargaining failure costs are high, the costs resulting from expropriation will be high too.

In general, where the law can intervene to actually alter the bargaining process in a way that makes bargaining failure less likely, it should incorporate such interventions and retain the property rule.[94] Such a modification of the property rule would retain its subjective-value protective function and at the same time reduce and perhaps eliminate the costs of bargaining failure. On the other hand, where the law cannot intervene to alter the bargaining process, the appropriate response may be to replace the property rule with the liability rule, provided the likelihood and cost of bargaining failure are sufficiently high. Examples of both types of deviations from the property rule are observed in the law. Labor law, for example, actually intervenes to regulate the bargaining process, and can do so because of the sequential nature of the bargaining process.[95] In the labor law setting, one observes a modified property rule, designed to dampen incentives to engage in strategic behavior. The other settings, where the law generally cannot intervene to regulate the bargaining process and the expected costs of bargaining failure are substantial, are exemplified by the eminent domain and nuisance settings. In those cases, one observes the law replacing the traditional property rule with a liability rule.

I will return to the incomplete information case later in this paper to illustrate the property rule's potential advantage over the liability rule in this setting. Specifically, the property rule can be modified to dampen incentives to engage in strategic behavior.[96] In

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[94] For an analysis of alternative property rules that is consistent with this view, see Richard A. Epstein, Takings, Commons and Associations: Why the Telecommunications Act of 1996 Misfired, forthcoming Yale L. J.

[95] Labor law is an area where incomplete information has a substantial impact on bargaining. The law has responded to this by adopting special rules that regulate the bargaining process. For discussion, see Part VI.D of this paper. Wachter and Cohen, supra note 7; Keith N. Hylton, An Economic Theory of the Duty to Bargain, 83 Geo L. J. 19 (1994).

[96] If the liability rule were modified in the same way, in order to dampen strategic conduct, it would still fail to protect subjective valuations, and for that reason remain unambiguously inferior to the property rule.

this case, introducing incomplete information may enhance the argument in favor of the property rule.

V. Harmful Externalities

I have focused so far on the case in which a taker seeks to acquire property of the victim. I have not formally considered the case of harmful externalities, injuries imposed on victims as a byproduct of the injurer's activity. In the case of a harmful externality, the injurer engages in an activity that imposes a risk of harm on the victim. By taking care the injurer can reduce the likelihood of harm to the victim. One typical example of a harmful externality setting is driving. The driver (injurer) imposes a risk of harm on a pedestrian (victim) when he drives down a street that is also used by pedestrians. The driver can reduce the likelihood of harm by driving carefully; but there is always a risk that a pedestrian will be injured by the driver no matter how carefully he drives. Pollution generated as a byproduct of some productive activity is another typical example of a harmful externality.

If we take the analysis of the preceding sections and re-label terms, we will see that the analysis applies with virtually no changes to the harmful externality setting. Wherever the analysis refers to the taker's subjective valuation, one should simply replace it with a reference to the "injurer's cost of care". References to the victim's subjective valuation should be replaced by a reference to the victim's harm (or the monetary value of the victim's injury).

The conclusions of the analysis of takings apply in a straightforward way to the case of injuries caused by harmful externalities. First, divide the transaction cost assumptions into three categories: high (where bargaining is infeasible), low (where bargaining is feasible and agreement likely to be reached), and intermediate (bargaining is feasible but there are informational and incentive impediments to reaching agreement). Whenever transaction costs are high and the cost of care for some injurers exceeds the maximum harm suffered by a victim, the liability rule is best (efficient). However, if the cost of care for all injurers is less than the minimum harm suffered by victims, a property rule operates just as efficiently as a liability rule. In the intermediate case, a liability rule may be preferable to a property rule if, as in the nuisance setting, the likelihood of bargaining failure is high. Finally, if transaction costs are low, the property rule protecting the victim is superior to the liability rule.

Indeed, and perhaps counter-intuitively, the argument in favor of the property rule is in some respects stronger in the harmful externality context than in the takings context. The reason is that harmful externalities will often involve direct physical harms to individuals. For example, the risk a driver imposes on pedestrians is a risk of serious physical harm – e.g., having a leg or an arm knocked off. Takings, on the other hand, will often involve theft of property rather than a physical injury.[97] Since harmful

[97] Obviously, some physical injuries are intentional and could be characterized as takings. Perhaps one straightforward example would be someone who steals a body part (e.g., a kidney) from another person. See W. Roughhead, Classic Crimes 68-104 (New York: Vintage Books, 1951) (detailing the story of Burke and Hare, the Edinburgh murderers who killed more than sixteen people in order to sell their bodies to medical institutions). One special feature of body part theft is that it arises in part because the sale of body parts is prohibited. Prohibition creates a shortage in which the demand for body parts far exceeds the supply, which provides incentives for the creation of a black market. The black market, in turn, provides incentives for theft – since it rewards body-part providers equally whether they acquired parts through theft or through good faith bargaining.

externalities will so often involve physical injuries, the subjective valuation problem will be present in a large percentage of the harmful externality cases.

Take the case of a car accident that destroys the victim's arm. What value should be given to the victim's arm? It should be clear that the subjective valuation demanded by the victim in a hypothetical trade would exceed the objective value most courts would try to determine in the damages phase of a lawsuit.[98] It follows that the liability rule grossly under-protects subjective valuations in cases of liability for physical harm. In spite of this, the liability rule is often the only feasible rule-type available, because transaction costs are too high for ex ante bargaining to take place in most harmful externality settings.

One immediate positive implication of this argument is that there will be continual pressure to get liability rules, in the physical harm setting, to mimic the protection provided by property rules. But this comes at a significant cost, since the uncertainty created by this mimicking effort discourages legitimate activity. Of course, to the extent that this pressure to mimic leads to an increase in damage awards, it may have a beneficial effect on incentives to take care. We observe this mimicking effort in the area of pain and suffering awards.[99]

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[98] This point is obscured somewhat by the probabilistic nature of most accidental injuries. In many cases, the risk of an injury is relatively low, so the potential victim may not ask for much in a hypothetical bargain because the likelihood of the injury being realized is tiny. But suppose the risk of injury is high – say fifty percent. Many victims would refuse any price to accept this risk, and those that do agree to bargain would probably demand a price that exceeds a damage award based on projected earnings losses. In addition to projected earnings losses, the potential victim would want to be compensated ex ante for the projected loss in utility experienced by being unable to participate fully in many recreational activities, and for the option value of the arm (e.g., the possibility that the victim, if he had both arms, might later become an excellent pianist). Setting pain and suffering awards aside, objective damage awards do not attempt to compensate for the utility deficit and option value associated with the loss of a limb.

[99] Consider, for example, pain and suffering awards for medical malpractice. To the extent that they lead to an increase in damage awards, they may provide doctors with greater incentives to take care. On the other hand, suppose pain and suffering awards cause medical malpractice liability rates to increase significantly because they are unpredictable. Increased malpractice rates will discourage doctors from entering high-risk

VI. Implications for Law

The conclusions of the foregoing analysis can be summarized easily. To simplify, I will refer to only one property rule, that protecting the victim, and I will refer to it as "the property rule". At the risk of repetition, putting the conclusions of the preceding sections together, we have:

Property Rule versus Liability Rule Theorem: When transaction costs are high (in the sense that bargaining is generally infeasible) and some takers have subjective valuations that exceed those of victims, the liability rule is preferable to the property rule (protecting the victim). When transaction costs are high and victims' subjective valuations exceed those of all takers, the property rule is equivalent to the liability rule. When transaction costs are low (in the sense that bargaining is both feasible and there are no informational or incentive impediments to reaching agreement), the property rule is preferable to the liability rule. When transaction costs are intermediate (in the sense that bargaining is feasible but there are informational or incentive impediments to reaching agreement), the property rule is preferable to the liability rule if the costs of failing to protect subjective valuations exceed the costs of bargaining failure.

This is a more complicated prescription than Calabresi and Melamed delivered, but the basic components of these propositions are implicit in their analysis. This paper has shown that in light of recent bargaining theory analyses, certain elements (e.g., the distribution of subjective valuations) of the Calabresi-Melamed analysis are more

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specialties. In this example, the attempt to use liability rules to mimic the protection provided by property rules could reduce social welfare – if the discouragement effect outweighs the care incentive effect.

important than was previously assumed. The key features of the revised propositions are assumptions regarding the distribution of transaction costs and of subjective valuations.

In the remainder, I will examine the implications of this revised "property rule versus liability rule theorem" for some familiar areas of the law.

A. Property Rules, Liability Rules and Tort Law

Property rules are preferable to liability rules when transaction costs are low because they protect subjective valuations, and by doing so, avoid enforcement costs and denormalization costs that would otherwise be generated under a liability rule. In the torts and property settings, the low transaction cost assumption generally applies to potential takings of real or personal property.

It follows from this basic proposition (part of the original Calabresi-Melamed analysis) that property rules are preferable to liability rules in settings where potential invaders or takers seek to acquire the real or personal property of other individuals. The law conforms to this prediction: trespass law operates as a property rule. Under trespass law, the victim can enjoin an invasion and hold the invader or taker strictly liable for the harm suffered. Moreover, the state, through its law enforcement agents, contributes directly to the enforcement of trespass laws. Since trespass is typically a part of the criminal code of most jurisdictions,[100] the victim can gain the aid of public enforcement agents in enforcing his right to exclusive possession of real or personal property.

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[100] See, e.g., Ala.Code 1975 § 13A-7-2 ("a. A person is guilty of criminal trespass in the first degree if he knowingly enters or remains unlawfully in a dwelling. b. Criminal trespass in the first degree is a Class A misdemeanor"); Col. C.R.S.A. § 18-4-502 ("A person commits the crime of first degree criminal trespass if such person knowingly and unlawfully enters or remains in a dwelling of another or if such person enters

One implication of property rule theory is that the rule should include a shield against invaders or takers who attempt to assert a liability rule against the possessor. For example, a trespasser who injures himself on the possessor's property could, by suing for damages, try to assert liability rule protection against the possessor. Alternatively, a trespasser who has injured the possessor's property could attempt to shift the liability to the possessor on contributory fault grounds, as in *LeRoy Fibre*.[101] However, to reward these efforts would allow the trespasser to expropriate part of the possessor's property. The value of the possessor's property would fall, to the extent the law protects the trespasser. The trespasser's wealth would increase.

Consistent with the theory of property rule protection, the law generally does not permit a trespasser to assert liability rule protection against the possessor of land.[102] In general, a landowner has no duty to take care to avoid injuring a trespasser.[103]

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any motor vehicle with intent to commit a crime therein. First degree criminal trespass is a class 5 felony"). For the Model Penal Code provision governing trespass, see MPC § 221.2 (1) (A person commits an offence if knowing that he is not licensed or privileged to do so, he enters or surreptitiously remains in any building or occupied structure or separately secured or occupied portion thereof. An offence under this Subsection is a misdemeanour if it is committed in a dwelling at night. Otherwise it is a petty misdemeanour.)

[101] LeRoy Fibre Co. v. Chicago, Milwaukee & St. Paul Ry., 232 U.S. 340 (1914).

[102] A trespasser might assert liability rule protection against a possessor of land in two ways. One is if the trespasser is harmed due to some condition of the property. In this case, the trespasser could assert liability rule protection by bringing a negligence claim against the possessor. The other way a trespasser could assert liability rule protection is in the course of defending himself against a suit for damages caused by his trespass. In this case, the trespasser could assert liability rule protection by claiming the possessor's harms were due to his own contributory negligence. Both attempts to assert liability rule protection have been rejected by courts. See, e.g., Buch v. Amory Manufacturing Co., 44 A. 809 (N.H. 1897)(no duty to a trespasser); LeRoy Fibre Co. v. Chicago, Milwaukee & St. Paul Ry., 232 U.S. 340 (1914) (no duty on part of landowner to take steps to avoid or minimize harm to his property caused by negligent or intentional invasion of another).

[103] I refer to the duty to *take care to avoid injuring* a trespasser, not to the duty to avoid intentionally injuring a trespasser. Although there is no duty on the landholder's part to take care, the landholder does have a duty to refrain from intentionally injuring the trespasser. E.g., Buch v. Amory Manufacturing Co., 44 A. 809 (N.H. 1897). Some states have moved away from the traditional rule absolving the landowner of a responsibility to take care to avoid injury to a trespasser. See, e.g., Rowland v. Christian, 443 P.2d 561 (Cal. 1968)(general negligence principles apply in case of trespasser). And there is another exception for attractive nuisances, Sioux City & Pacific R.R. v. Stout, 84 U.S. 647 (1873).

Liability rules are generally preferable when transaction costs are high.[104] Again, the law conforms to this prediction, as was shown in the Calabresi-Melamed article. Negligence and nuisance rules typically apply to areas in which the cost of transacting is high.

Consider negligence first. Negligence typically applies to accidents that occur in settings where the injurer cannot bargain with the victim in advance over a potential waiver to a claim of liability. If the potential offender owes a duty of care to the victim,[105] he will be required to compensate the victim after the injury by an amount that will be determined by a court. Negligence law, in contrast to a property rule such as trespass, does not empower the victim to enjoin a potential breach of the duty of care.

Unlike the typical negligence case, nuisance cases typically arise between adjacent landholders, a setting in which transaction costs appear to be low. However, as Merrill noted, one special feature of nuisance that takes it out of the low transaction cost category is that it is often difficult to define the property right that is being protected by nuisance law.[106] For example, it is difficult to define the right to clean air, or the right to a quiet evening. Further, given that nuisances sometimes injure several parties at the

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[104] Calabresi and Melamed, supra note 1, at 1106; Kaplow and Shavell, supra note 8, at 727.

[105] One point sometimes ignored in the property versus liability rule literature is that liability rules typically have allocation or channeling rules that determine the party the liability rule is designed to protect, or sometimes disable the liability rule. Of course, Calabresi and Melamed recognized this issue in their famous Rule Four discussion, supra note 1, at 1116-1122. But their Rule Four discussion ignores the disabling feature. In tort law, duty rules allocate liability rule protection and sometimes disable the liability rule. In the trespass setting, the rule denying a duty to a trespasser is an allocation rule. The allocation rule serves to shield the property owner from expropriation by the trespasser through the trespasser's assertion of a liability rule.

[106] Merrill, supra note 7, at 23.

same time, the hold-out incentives identified by Calabresi and Melamed are often present.[107]

In general nuisance settings involve instances of intermediate transaction costs, in the sense that the cost of meeting to bargain is low, but the cost of reaching an agreement is high. Because the cost of meeting to bargain is low, nuisance law permits plaintiffs to enjoin defendants under certain conditions, which is one of the types of protection provided by property rules. However, because the cost of actual bargaining to agreement is high, nuisance law operates generally as a liability rule. The reason I say that nuisance law operates as a liability rule is simple: unlike trespass law, there is no background norm in the nuisance setting that the invader must first get the consent of the victim. The nuisance generator can conduct his activity, and may be forced to compensate the victim if the activity is later deemed by a court to be a nuisance. The right to enjoin typically arises in even more limited settings involving nuisances, and even then only in relatively harmful cases.[108]

In sum, tort doctrine conforms to the transaction-cost based division between property rules and liability rules originally set out by Calabresi and Melamed and expanded in this paper. One remaining piece of the theory that needs to be applied is the statement that property rules are equivalent to liability rules when transaction costs are high and the subjective valuations of invaders are less than those of victims.

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[107] Suppose, for example, smoke damages each of 10 homes located near a factory. This is similar to the eminent domain example discussed in Calabresi and Melamed, supra, 1106-1108. See also, A. Mitchell Polinsky, An Introduction to Law and Economics 13-16 (New York, NY: Aspen Publishers, 3d ed. 2003) (examining Coase Theorem in a large numbers setting).

[108] See Prosser, Handbook on the Law of Torts, 602-605; Boomer v. Atlantic Cement Co., 257 N.E.2d 870 (N.Y. 1970). For a theoretical account of the injunction versus damages determination, see Keith N. Hylton, A Missing Markets Theory of Tort Law, 90 Northwestern U. L. Rev. 977 (1996).

What is an example in tort law of a setting in which transaction costs are high and invader subjective valuations are generally less than those of victims? The standard case of recklessness falls in this category. Consider, for example, a teenager on a joy ride speeding through an area crowded with pedestrians. The gain to the teen from his activity is relatively trivial, at least from the eyes of any outsider who attempts to evaluate it. However, the loss to victims whose lives are put at risk is extremely high. Or, take the case, of an individual who plays with a loaded gun on a subway car. These are cases in which invader subjective valuations are less than those of victims.[109]

I realize that this argument involves an interpersonal comparison of utility. In economics, that is generally understood to be a fruitless exercise. There is no accepted cardinal measure of utility that would allow us to make interpersonal comparisons.[110] However, in law, such comparisons are necessary. The law cannot take a position of agnosticism on the relative values at stake when a person speeds through a crowd of pedestrians or plays with a loaded gun on a crowded subway car. The law has to make broad statistical judgments on relative valuations in such settings.

Thus, under this paper's framework, property rules should be applied in cases of recklessness, and this is what is observed. The law treats reckless conduct as equivalent

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[109] Calabresi and Melamed offer an alternative example. "If Taney sets a spring gun with the purpose of killing or maiming anyone who trespasses on his property, Taney has knowledge of what he is doing and of the risks involved which is more akin to the criminal than the negligent driver. But because Taney does not know precisely which of many Marshalls will be the victim of his actions, ex ante negotiations seem difficult. How then do we justify the use of criminal sanctions and of more than compensatory damages? Probably the answer lies in the fact that we assume that the benefits of Taney's act are not worth the harm they entail if that harm were fully valued." Calabresi and Melamed, at 1126 n.71.

[110] See, e.g., Mark Blaug, Economic Theory in Retrospect 570-71 (Cambridge Univ. Press, Fifth ed. 1997). In contrast, Bentham showed impatience toward the argument that interpersonal comparisons could not be made. For example, in discussing the connection between wealth and happiness, Bentham said that "of two individuals, he who is richer is the happier or has the greatest chance of being so." Bentham Security and Equality, supra note 4, at 47. His explanation was straightforward. "This is a fact proved by the experience of the all the world. The first who doubts it shall be the very witness I will call to prove it. Let him give all his superfluous wealth to first comer who asks him for it; for this superfluity, according to his system, is but dust in his hands; it is a burden and nothing more." Id.

to intentional conduct governed by trespass doctrine – in the sense that it denies contributory negligence defenses, dispenses with any inquiry into fault, and occasionally allows for punitive damages. The law does not aim simply to require compensation, but to prohibit the conduct altogether.

B. Criminal Law

For criminal law, there are two propositions from this framework that are most useful for a positive theory. First, the property rule protecting the victim is preferable to the liability rule when transaction costs are low. Second, when takers' subjective valuations are all below those of victims,[111] the property rule is equivalent to the liability rule, and superior when it is necessary to disseminate a clear prohibitory message to potential takers.

These propositions suggest two general goals for criminal law. One, recognized by Posner, is to prevent "market bypassing".[112] In other words, one goal of criminal law is to prevent takers from taking things in settings where they could just as easily bargain and find a price that meets the subjective valuation of the potential victim. For example, criminal law prohibits theft because it attempts to force potential thieves to use the market rather than simply take what they want. As Posner has demonstrated, the market-

[111] To be more precise, when the domain or support of the probability distribution of taker valuations lies entirely below (or to the left) of the support for the distribution of victim valuations, the property rule is equivalent to the liability rule.
[112] Posner, supra note 7, at 1195.

bypassing theory provides a rich positive theory of criminal law.[113] Posner's theory can be viewed as an implication of the Calabresi-Melamed framework.[114]

The other goal for criminal law suggested by this paper's analysis is to prohibit takings when the subjective valuations of takers are all below those of victims. The importance of this second goal becomes clear once we compare it to Posner's market-bypassing theory (the first goal). The market-bypassing theory, although quite powerful, does not explain substantial parts of criminal law.[115]

One part of criminal law unexplained by the market-bypassing theory is the law of reckless endangerment.[116] For example, consider the case of speeding in the wrong direction along a road during a time when traffic is heavy. Reckless conduct is generally not explained as a type of market bypassing. Unless we consider general safety as an

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[113] Id., 1214-1230.

[114] Indeed, Calabresi and Melamed discussed the implications of their framework for criminal law in their original article, supra note 1, at 1124-1127. Their discussion clearly anticipates Posner's market-bypassing theory.

[115] To be fair, Posner apparently realizes this, because he switches to Hand formula (or "BPL") reasoning in several parts of his article. See Posner, supra note 7, at 1221 (explaining intent doctrine) and 1226 (recklessness). Yet Posner contends that the prevention of market bypassing is the major function of criminal law, id. at 1195. His arguments and illustrations, however, are more consistent with the framework set out in this paper. Criminal law has the dual goals of preventing market bypassing and takings where the subjective valuations of takers are below those of victims. Both goals are equally important in any consistent utilitarian framework.

[116] *See* Joshua Dressler, Understanding Criminal Law 140 (Lexis Publishing, 3d ed. 2001), citing Model Penal Code § 2.02(2)(b)(i) (The Code provides that a person acts "recklessly" if he "consciously disregards a substantial and unjustified risk that the material element exists or will result from his conduct." A risk is "substantial and unjustifiable" if "considering the nature and purpose of the actor's conduct and the circumstances known to him, its disregard involves a gross deviation from the standard of conduct that a law-abiding person would observe in the actor's situation.") *State v. Goodwin,* 143 S.W.3d 771, 777 (Tenn. 2004) (defendant guilty of reckless endangerment after he left a gun in the woods which was later found and used by two children who believed it to be a toy, leading to the death of one child and injury of the other); *State v. Brooks*, 658 A.2d 22, 25-26 (Vt. 1995) (Defendant was aware of heating system leak that allowed carbon monoxide to enter his house and had been warned that his lack of action was akin to playing Russian roulette. Defendant chose not to fix the problem and did not disclose the problem to the subsequent buyers of the house. Defendant was convicted of reckless endangerment after the buyers and their child died as a result of the carbon monoxide leak.); U.S. v. Williams, 254 F.3d 44 (C.A.2, 2001) (defendant guilty of reckless endangerment after he sped and drove the wrong way on a one way street in the course of being pursued by police).

entitlement, the reckless actor does not attempt to take something from the victim that he could have easily acquired through bargaining.

Reckless conduct is best described as a case where the cost of forbearance or care for all potential injurers engaging in the conduct is less than the harm suffered by every victim. In terms of the property versus liability rule propositions set out earlier in this paper, reckless conduct cases are those in which the subjective valuations of injurers (in this setting, avoidance costs) are all substantially below the harm imposed on victims. Given this, there is no social gain generated by reckless conduct. The law should aim to completely deter it, and this is what we observe.

Another part of criminal law that is not explained by the market bypassing theory is the felony-murder rule. Under the rule, an offender will be convicted of murder when he accidentally kills a victim during the course of a felony, such as a robbery.[117] For example, suppose an offender is holding someone up with a handgun. The offender hears a sudden noise, is startled, and shoots, killing the victim. Although the offender may not have set out with the aim to kill his robbery victim, he will be convicted under the felony-murder rule.[118]

Felony-murder cases are not easily explained by the market bypassing theory. In one sense, they can be explained market-bypassing theory because the murder often

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[117] See Dressler, supra note 114 ("At common law, a person is guilty of murder if she kills another person during the commission or attempted commission of a felony … The felony-murder rule authorizes strict liability for a death that results from the commission of a felony"); State v. Dixon, 122 P.3d 883 (Kan. 2005) (felony-murder conviction after apartment exploded as a result of defendant turning over stove in the course of a robbery, causing gas to escape); People v. Stamp, 82 Cal. Rptr. 598 (Cal. App. 1969)(fear and alarm caused by armed robbery induces heart attack in victim).

[118] Dressler, supra note 114, at 515 ("The felony-murder rule applies whether a felon kills the victim intentionally, recklessly, negligently, or accidentally and unforeseeably."). See also, People v. Davis, 213 Ill. 2d 459, 489 (2004) ("In the stereotypical felony-murder case, an armed robber enters a store and demands money. The clerk hesitates, or resists, or perhaps merely makes a sudden movement that startles the robber, who fires his weapon, killing the clerk. It is immaterial whether the robber pulls the trigger intending to kill the clerk, or knowing that the clerk's death is substantially likely to result, or wanting only to impress the clerk with the seriousness of his demand, or entirely by accident.").

occurs in connection to some market-bypassing felony, such as armed robbery. The problem with this theory is that the murder itself is not immediately motivated by the same interest that led to the robbery. The robbery is an instance of market bypassing. The murder is often the result of a simple accident – as in the case of an armed robber who trips in a way that causes his gun to go off.

The felony-murder rule is better understood as addressing an injury that occurs in an instance in which the underlying activity is socially harmful.[119] The core of reckless endangerment, generally, involves the decision to engage in an activity that imposes great risks on others for a gain that is trivial in comparison, or a gain that can be realized in a far less harmful way. The felony-murder case fits most easily into this category. The legal treatment of felony murder should be viewed as a special case of the treatment of reckless conduct generally.[120]

As a third illustration of this paper's implications for criminal law, consider the necessity defense.[121] The necessity defense reflects a combination of both the market-bypassing and subjective valuation propositions. In other words, the necessity defense cannot be understood as an immediate implication of the market bypassing theory alone.

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[119] Again, Posner's analysis anticipates this point without quite elevating it to its proper status in an economic analysis of criminal law. Posner, supra note 7, at 1222 ("The male can avoid liability for statutory rape by keeping away from young girls, and the robber can avoid liability for felony murder by not robbing, or by not carrying a weapon. In effect we introduce a degree of strict liability into criminal law as into tort law when a change in activity level is an efficient method of avoiding a social cost.")

[120] To continue the comparison with Posner, this is not in my view a case of eliminating the issue of intent because we have decided to impose strict liability, as Posner suggests, supra note 7, at 1222. This is a case of inferring criminal intent because the injurer's conduct evinces a disregard or indifference to the welfare of his potential victims. And this is true generally of reckless conduct.

[121] See, e.g., *Commonwealth v. Schuchardt*, 557 N.E.2d 1380, 1381 (Mass. 1990)("Under the common law defense of justification by necessity, a crime committed under the pressure of imminent danger may be excused if the harm sought to be avoided far exceeds the harm resulting from the crime committed"); *United States v. Gomez,* 92 F.3d 770 (9th Cir. 1996) (convicted felon allowed to possess gun in violation of his terms of release because of imminent threat to his life); *People v. Unger*, 362 N.E.2d 319 (Ill. 1977)(necessity defense in the case of a prison escape by an inmate who was being abused by fellow inmates); State v. Baker, 579 A.2d 479 (Vt. 1990) (necessity defense in case of driving with suspended license in order to bring take a loved one to the hospital in an emergency).

The defense arises in settings where transaction costs are high *and* the taker's subjective valuation is greater than that of the victim. Consider, for example, the case of the starving man who breaks into a cottage to steal some food. In this case the cost of transacting is high (since the owners are not home) and the subjective value of the taker (preserving his life) is greater than that of the victim (preventing a broken window). In the case in which the cost of transacting is high and the taker's subjective valuation is relatively small (the taker, well fed, sees a chocolate cake in the cottage that he wants to devour), the necessity defense does not apply.

C. Theory of Damages

Property rules and liability rules correspond to policies. The property rule protecting the victim reflects a policy prohibiting the taker from taking an act that injures the victim. The liability rule, on the other hand, reflects a policy of internalization. The rule forces takers to pay an objectively assessed determination of the loss suffered by the victim. In this sense, the victim's loss, or at least the objective part of it, is internalized or shifted to the taker.

These policies can be applied to the determination of damages.[122] Indeed, these policies should be applied to the determination of damages because society will not always be able to prohibit harmful conduct under the property rule. In some cases, the conduct will occur, and society will have to set up a system of penalties, to be applied

[122] From a roughly similar framework applied more extensively, see David D. Haddock, Fred S. McChesney, and Menahem Spiegel, An Ordinary Economic Rationale for Extraordinary Legal Sanctions, 78 Cal L. Rev. 1 (1990). For a wide ranging discussion of the policies behind property rules and liability rules and their implications for remedies, see Hanoch Dagan, Unjust Enrichment: A Study of Private Law and Public Values 14-22 (Cambridge University Press, 1997).

after the injury, that will have the effect of prohibiting the undesirable conduct in the future. Since society will often have to permit victims themselves to be the ones to enforce the policies underlying the law, damage judgments corresponding to property rules should be designed to serve the goals of the property rule.

The goals of property rule protection are twofold: to completely deter or prohibit nonconsensual invasions and to protect subjective in addition to objective components of value. This implies, first, that the damage level corresponding to the property rule protecting the victim should be no less than the minimum amount necessary to deter the taker or injurer from engaging in the harmful conduct. Any amount less than the "complete deterrence" level of damages would effectively permit invasions to occur, contradicting the prohibitory goal of property rule protection. Second, the goals of property rule protection imply that the damage level corresponding to the property rule protecting the victim should be no less than the amount necessary to compensate the victim's total loss, including subjective components. Any amount less than this would fail to protect subjective valuations.

Given that complete deterrence should be the goal of damages under a property rule, it is straightforward to see what the minimum amount must be. The damage award must be at least as great as the subjective valuation of the taker. To return to the bicycle example of the start of this paper, suppose the taker's subjective valuation is $100 and the victim's subjective valuation is $85. To ensure that the policy of the property rule is put into effect, the damage amount that is assessed against the taker must be no less than $100. Any damage assessment less than $100 allows the taker to gain from a taking, and therefore fails to completely deter or prohibit the taking.

There is a second level below which the damage level under a property rule should not be set. Since property rule protection safeguards subjective valuations of entitlements, the damage level should in theory compensate for any expropriation of the subjective component of valuation. Return to the bicycle example. Suppose the taker's subjective valuation of a bicycle is $25 and the victim's subjective valuation of his bicycle is $85. The prohibitory policy of property rule protection is satisfied by any damage award greater than $25. But if a taking occurs, and the damage award is set at the objective level of $75, the victim will lose $10, contradicting the protective goal of property rule protection.

It follows that property rule protection implies that the damage level under the property rule regime should be no less than the larger of (1) the taker's subjective valuation and (2) the victim's total loss, including the subjective component. To return to the bicycle example, this implies that if the taker's valuation is $25 and the victim's valuation is $85, the correct damage level under property rule protection is $85. On the other hand, if the taker's valuation is $100 and the victim's valuation is $85, the correct damage level is $100. Of course, this argument assumes these amounts are observable and measurable by the court. In the simple case in which the taker's subjective valuation is captured by the monetary profit he gains from a taking, that assumption is often satisfied.

At the risk of repetition, this rather simple and abstract argument can be applied easily to the determination of damages in tort cases. The theory suggests that in cases of intentional invasions that occur in low-transaction cost settings, damages should be set so that they are no less than the larger of the taker's gain or the victim's total loss. This

approach has a noticeable effect on the determination of damages when the taker's valuation exceeds that of the victim. In this case, the total damage award should exceed the victim's loss. However, when the taker's valuation is less than that of the victim's a court is compelled by this theory to do its best to compensate both objective and subjective components of valuation.

Does the law correspond to this prediction? In a rough sense, the answer is yes. The law of conversion distinguishes between innocent and knowing actors.[123] The knowing converter acts in a low transaction cost setting, because his knowledge implies that he could have easily bargained with the owner before taking the property. The innocent converter, in comparison, acts in a high transaction cost setting. In the case of the innocent converter who digs gold from the victim's property or cuts down trees, the damage remedy is the value of the property taken less the value of the defendant's labor.[124] In the case of the willful converter, the damage remedy is the value of the property taken with no reduction to reflect the value of converter's labor.[125] In other words, in the case of the intentional converter courts impose a gain-stripping judgment that exceeds the victim's loss.[126]

The law of punitive damages permits courts to levy such damages when the defendant has acted with intent or malice. Certainly the intentional taking of property – e.g., stealing a bicycle – serves as an example of an act done with an intent to harm. In many jurisdictions, courts have permitted juries to consider the gains or profits received

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[123] See, e.g., Richard A. Epstein, Cases and Materials on Torts 572-73 (Aspen Publishers, 8th ed. 2004)
[124] Id.
[125] Id.
[126] The election to sue for restitution permits the plaintiff to make the determination whether he gains more by suing for damages or for unjust enrichment. See William L. Prosser, Handbook of the Law of Torts 628 (1971); Arthur Corbin, Waiver of Tort and Suit in Assumpsit, 19 Yale L. J. 221 (1910).

by defendants in the assessment of punitive damages,[127] though that law is now open to question as a result of *State Farm v. Campbell*.[128] Moreover, punitive damage cases have often referred to subjective (or non-measurable) components of loss as a justification for a punitive award.[129] In effect, punitive damages law has evolved to further the policies embedded in property rules. By allowing and indeed encouraging courts to add a surcharge to damages when the taker has acted with intent to harm, the law of punitive damages works to prevent property rules from being converted into liability rules.

Continuing with the general theory, the other case in which the property rule policy may be applied is where the subjective valuations of takers generally are less than those of victims. I suggested the case of reckless conduct as the prime example earlier in this paper. Here, too, punitive damages law permits courts to add a surcharge to the damage award when the injurer (or taker) has acted in a way that shows an indifference to

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[127] See, e.g., Jacque v. Steenberg Homes, Inc., 563 N.W. 2d 154, 165 (1997) ("punitive damages must be in excess of the profit created by the misconduct so that the defendant recognizes a loss"); Green Oil Co. v. Hornsby, 539 So. 2d 218, 223-224 (Ala. 1989)(seven factor test for punitive awards including profits from injury as factor); Bowyer v. Hi-Lad, Inc., 609 S.E. 2d 895, 900 (W. Va. 2004)("if the defendant profited from his wrongful conduct the punitive damages should remove the profit and should be in excess of the profit, so that the award discourages future bad acts by defendant"); Marie Deonier & Associates v. Paul Revere Life Ins. Co., 101 P. 3d 742, 749 (list of factors including "the profitability of the defendant's wrongdoing"). The Supreme Court has supported the use of profits in determining the measure of punitive damages. See Pacific Mutual Life Ins. Co. v. Haslip, 499 U.S. 1, 21-22 (1991)(approving of the seven factors used by Alabama courts to determine punitive awards, two of which were based on profits); Cooper Industries, Inc. v. Leatherman Tool Group, Inc., 532 U.S. 424, 442 (2001)(noting that profits gained as a result of defendant's wrongdoing could be used to determine punitive damages in order to deter future conduct).

[128] 538 U.S. 408, 409-410 (2002) (arguing that the Constitution's Due Process Clause requires a close connection between the harm suffered by the plaintiff and the punitive award). For a discussion of the consideration of illicit profits in the determination of punitive damages, see Brief of Keith N. Hylton as Amicus Curiae in Johnson v. Ford, No.B121917, available at http://www.bu.edu/law/faculty/amicus.

[129] See, e.g., Alcorn v. Mitchell, 63 Ill. 553, 553 (1872)("It is customary to instruct juries that they may give vindictive damages where there are circumstances of malice, willfulness, wantonness, outrage and indignity attending the wrong complained of"); TVT Records v. Island Def Jam Records, 279 F. Supp. 2d 413, 420 (S.D.N.Y. 2003)(describing injuries worthy of punitive damages as those that "weigh substantially more in relation to the damages assayed in unquantifiable terms, for example, effects on the victim's human dignity, social equality or moral worth or on general public health, safety, or order"); Kemezy v. Peters, 79 F. 3d 33, 34 (7th Cir. 1996) (noting, as one of several justifications for punitive damages, that compensatory damage awards "are likely to fall short in some cases, especially when the injury is of an elusive or intangible character").

the welfare of his victims. Consider, for example, someone who fires a gun into a crowd, causing only minor damage. Most courts would have little trouble finding such conduct to be reprehensible and deserving of a punitive judgment. Again, punitive damages law works in this case to preserve the policy behind the underlying property rule.

Under the theory of this paper, the purpose of a punitive damage award is to ensure that the policy of the property rule is put into effect – or, to prevent the property rule from being converted into a liability rule. The punitive damage award appears in this theory not to be puzzling wrinkle in the common law. Punitive awards serve the important function of making sure that property rules mean what they say.

There is an alternative theory of punitive damages that holds that they should be designed to compensate for uncertainty in punishment.[130] According to this theory, if defendants typically avoid liability in fifty percent of their injuries, damages awards against them should be doubled in order to make sure that defendants pay for the full loss they impose on society. This theory is by no means inconsistent with that of this paper. However, it should be understood as a theory of liability rules only. Multiplying damage awards in order to compensate for uncertainty simply ensures that losses, objectively measured, are shifted to injurers.

As a general matter, before any attempt is made to multiply damages, a court should first determine whether property rule or liability rule protection is appropriate. If liability rule protection is appropriate, it may be desirable to multiply damages to compensate for uncertainty in punishment, though this is often unnecessary and in

[130] A. Mitchell Polinsky and Steven Shavell, Punitive Damages: An Economic Analysis, 111 Harv. L. Rev. 869 (1998).

general depends on many factors.[131] If property rule protection is appropriate, the court should first determine that the award is large enough to fully compensate the victim for both objective and subjective losses, and to wipe out any gains enjoyed by the injurer. In cases where punishment is uncertain, it may be necessary to multiply the gain-eliminating quantity in order to provide the appropriate level of deterrence.

The theory offered here also has implications for "pain and suffering" awards. Awards for pain and suffering typically reflect the effort of a court to estimate the subjective component of loss. Indeed, many plaintiff attorneys attempt to persuade jurors and judges to provide such damages by asking them to consider what a typical person would demand to be left in the condition of the victim.[132] Once we recognize that pain and suffering awards reflect judicial efforts to estimate the subjective component of loss, their role in a system of damages becomes clear under the theory of this paper.

The general role or function of pain and suffering damages is as follows. Under the conditions in which the property rule is socially preferable to the liability rule, they are unquestionably permissible. They function in a way that is similar to punitive

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[131] Richard Craswell, Deterrence and Damages: The Multiplier Principle and its Alternatives, 97 Michigan Law Review 2185 (1999).

[132] See, e.g., Klotz v. Sears, Roebuck, & Co. 267 F.2d 53 (7th Cir. 1959) (plaintiff's attorney asked jury "What is the eye worth and what could you get anybody to give it to you for?" and to "give us the kind of deal that you would want to get"); F.W. Woolworth Co. v. Wilson, 74 F.2d 439, 442 (C.A. 5 1934) (counsel asked jury "take it yourselves, would you swallow that glass and put yourself in that girl's position for a few paltry thousand dollars?"); A.C. ex rel. Cooper v. Bellingham School Dist., 105 P.3d 400, 407 (Wash. 2004) ("And think about really what it boils down to is what's the value of a dollar. What do you have to go through to get your dollars? What do they mean to you when you have them? Think about what it means to you."); Czerski v. Yellow Cab Co-op, Inc. 2004 WL 2475559 (Cal. App. 1 Dist. 2004) (asking the jury "what would we have to pay to you Mr. Reasonable Person, for you to walk around with a broken tibial fracture? What would that cost?"); Rodriguez v. Slattery, 194 N.W. 2d 817, 819 (Wis. 1972) ("If it was your 7 year old, I don't think you would go for that [award]."). In these examples, the appellate courts criticized the plaintiff's argument because it encouraged the jury to depart from neutrality. However, the attempt to get the jury to look at pain and suffering as compensation for subjective losses is probably the standard practice of trial lawyers.

damages. By forcing the taker to pay for the subjective component of the victim's total loss, they prevent property rules from being converted into liability rules.

Under the conditions in which a liability rule is preferable to a property rule, pain and suffering awards appear to be difficult to defend. Pain and suffering awards attempt to mimic the subjective valuation protection provided by property rules, though under a liability rule regime. However, liability rules, unlike property rules, are not designed to protect subjective valuations. Liability rules reflect a social decision to permit some risk-generating activities to occur even though they might result in an uncompensated loss to the victim in certain cases. The reason is that the social gain from these activities exceeds the social cost.

Under the paper's model, the desirability of pain and suffering awards under a liability rule regime is unclear. On one hand, liability rules assume by their structure a level of risk bearing on the part of the victim that is not consistent with compensating subjective components of loss. On the other hand, the undercompensation problem is probably most severe in the case of suffering caused by physical injury. This suggests that the only case that can be made for pain and suffering awards under a liability rule regime is one based on empirical evidence demonstrating socially desirable incentive effects.[133]

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[133] If objective damages are generally correct on average because the subjective component of loss averages out to zero, adding a positive "pain and suffering" option pushes the average damage award above the average total loss. This leads to overdeterrence, and implies that social welfare under the liability rule without pain-and-suffering awards exceeds social welfare under the liability rule with pain-and-suffering awards. In the case of physical injury, the assumption that the subjective component averages to zero is probably incorrect; the average is probably positive. However, the problem in the case of physical injury is that the pain-and-suffering award's size and unpredictability might still result in overdeterrence. In addition, the pain-and-suffering option introduces a highly unpredictable component of damages, which increases the cost of litigation. The cost of litigation increases because the uncertainty associated with pain and suffering awards makes settlement of litigation less likely. On settlement incentives generally, see Steven Shavell, Suit, Settlement and Trial: A Theoretical Analysis Under Alternative Methods for the

D. Property Law: Eminent Domain

In *Kelo v. New London*,[134] the United States Supreme Court held that the "public use" requirement of the Constitution's takings clause was satisfied in a case in which the condemned land was to be transferred to a private developer to construct a commercial complex including stores and business facilities. This paper's framework sheds light on the function and desirability of the public use requirement.

Calabresi and Melamed described eminent domain as a potentially efficient liability rule because it prevents hold-outs from blocking development projects.[135] However, Calabresi and Melamed also suggested that the eminent domain rule's efficiency depends on a comparison of costs and benefits.[136] If property is transferred with a compensatory award given to its previous owners, their subjective valuations may be expropriated. Enforcing a property rule, however, runs the risk that the development will be blocked. The liability rule is preferable to the property rule when the losses from blocking efficient developments exceed the costs of expropriation.

The Calabresi-Melamed discussion, though valid as a general matter, presents a somewhat ahistorical picture of the eminent domain problem by emphasizing the rule's function as a solution to the hold-out problem. Probably the most important function of the compensation rule is to dampen incentives for expropriation. If a government knows

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Allocation of Legal Costs, 11 J. Legal Stud. 55 (1982). On the predictability problem and pain and suffering awards, see Ronen Avraham, Putting a Price on Pain-and-Suffering Damages: A Critique of the Current Approaches and a Preliminary Proposal for a Change, 100 Nw. U. L. Rev. __ (2005); Bovbjerg, Sloan and Blumstein, Valuing Life and Limb in Tort: Scheduling pain-and-suffering, 83 Nw U. L. Rev. 908 (1989).

[134] 545 U.S. __ (2005).

[135] Calabresi and Melamed, supra note 1, at 1106-1108.

[136] Id.

that it must compensate property owners when it takes their property, it is less likely to do so for bad motives. And if the government knows that is must compensate, then those who lobby the government in order to bring about the transfer know that their chances of success are inversely related to the level of compensation required.

Compensation plays an important role in dampening rent-seeking incentives, but it may not be sufficient. If a private developer can make a profit by having land transferred to it at a price set by the state – a call option on the land – the developer may have a strong incentive to lobby for the government to condemn property and transfer it even with compensation required. This is especially true if the market value of the land targeted for transfer is low. The lobbying process and its distorting effects on government are part of the denormalization costs identified earlier in this paper.

This suggests a function for the public use requirement in the Takings Clause. Since the compensation requirement is not sufficient to deter rent-seeking by private parties, the public use requirement is likely to be a useful additional barrier; especially in the case in which, because of the land's low market value, the compensation requirement is a weak deterrent against land grabs. If the social costs of rent-seeking are high relative to those connected to bargaining failure, then the public use requirement will enhance social welfare. As I noted earlier, this is an empirical question, but the inclusion of the public use requirement in the constitution's text presumably indicates a perception on the part of its framers that the requirement served a useful function in light of the historical evidence.

E. Conditional Property Rules and Incomplete Information

Michael Wachter and George Cohen have extended the property and liability rule paradigm by including a "bargaining rule".[137] The bargaining rule is observed, as far as I can tell, in only one area of the law: labor law. The bargaining rule works as follows. The holder of an entitlement is protected from taking, just as in a property rule regime. However, the holder cannot make use of his entitlement unless he satisfies an obligation to bargain in good faith with the other party. The bargaining rule, in effect, sets up a conditional entitlement. The entitlement is incomplete until the holder satisfies certain conditions.

To see how a conditional entitlement scheme might enhance efficiency, return to the example discussed earlier of bargaining under incomplete information (Part IV). The victim (entitlement holder) places a value of $75 on the bicycle. There are two types of high-valuing takers, with valuations of $100 and $80, and one type of low-valuing taker with a valuation of 25. The efficient outcome is one in which high-valuing takers acquire bicycles and low-valuing takers do not. Under a property rule, all exchanges must take place through voluntary bargains. Because of incomplete information, the victim does not know whether the taker's valuation is $100 or $80 (he knows it is not $25, because no low-valuing taker would approach him for a trade). Recall that under the property rule, some efficient exchanges might not take place because the victim might make a demand of $99, hoping that the surplus gained from trades with the $100-value takers would more than offset the forgone trades with the $80-value takers.

Now suppose we introduce the bargaining rule. Under the bargaining rule, all exchanges must take place through voluntary trades. However, the victim (holder of

[137] Wachter and Cohen, supra note 7.

entitlement) must bargain in good faith in order to gain full use of his property. How does this work? Suppose the victim, with a modest expenditure can determine whether he faces a $100-value taker or an $80-value taker. He decides not to invest in identifying the taker's type because he profits more by the strategy of making high demands and forgoing trades with the $80-value takers. If the victim makes a demand of $99 to a taker whose valuation is $80, the bargaining rule denies the victim full use of his entitlement until he satisfies good faith obligations (e.g., to identify the taker type).[138] If the entitlement's value to the victim drops sufficiently far (because the victim is denied full use of it), the victim will have an incentive to identify the taker type first. Moreover, the outcome in which the victim satisfies good faith obligations may be socially desirable to that in which he acts strategically.

To be more specific, the victim has a choice in this example to make a demand of $99 or $79. If he makes a demand of $79 it will always be accepted, giving him a gain of $4. If he makes a demand of $99, it will be accepted only by the $100-value takers. If the percentage of $100-value takers exceeds 16.7 percent, he will prefer to make the $99 demand.[139] Again, the reason for this is that the victim gains more by getting a $24 surplus in trades with $100-value takers while forgoing trades with the $80 takers.

Now suppose the victim can find out the taker's type by spending $2. Suppose the percentage of $100-value takers is .55. Then the victim will not invest the $2 to identify the taker's type, because he is still better off getting the $99 payment from $100-

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[138] Labor law often imposes, as part of the good faith requirement, a duty to meet with the other bargaining party. This could be seen as a requirement that each bargaining party spend some resources to identify the other party's "type". Meeting face-to-face allows each party to observe facial expressions and other signals of the seriousness with which the other party views its own bargaining positions.

[139] Let the proportion of $100-value takers among the high-valuing takers be p. The strategy of demanding $99 is preferable to the victim if $p(\$24) > p(4) + (1-p)(\$4)$, which is true when $p > .167$.

value takers and forgoing trades with the $80-value takers.[140] However, this is an inefficient result. The joint wealth of takers and victims would be greater if the victim invested the $2 to learn the taker's type before making a price demand. The reason the victim's choice diverges from what is best for society is that the victim focuses only on that portion of the surplus that goes to him, giving no weight at all to the portion of the surplus that goes to the taker.[141]

A bargaining rule could change the incentives for the better. A bargaining rule reduces the value of the entitlement to the victim when the victim fails to bargain in good faith (in this case, fails to invest in identifying the taker's type and the bargain fails). If the value of the entitlement to the victim falls sufficiently far ($0.44 is sufficient in this example),[142] the victim will prefer to spend the $2 fee to determine the taker's type rather than make a strategic high-price demand.

This example illustrates how a bargaining rule could improve efficiency relative to a property rule in settings of incomplete information. It suggests that it is possible to modify the property rule regime, as we see in the labor law area, to reduce the efficiency costs of strategic behavior. This result, coupled with the finding that property rules protect subjective evaluations, suggests that property rule regimes have an advantage in

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[140] Note that if the victim makes a $99 demand, his average payoff will be (.55)($24) = $13.2. If he pays the $2 to identify taker types, his average payoff will be (.55)($24) + (.45)($4) - $2 = $13. He will therefore make the $99 demand. In general, in this example, the victim will prefer to make the $99 demand if $p(\$24) > p(\$24) + (1-p)(\$4) - \$2$; so if $p > .5$, the victim will prefer the high demand strategy to investing $2 to identify the taker's type.

[141] The social condition compares the total surplus, not the surplus received only by the victim. Under a total surplus comparison, we should compare the average surplus forfeited (from forgone trades) with the cost of the investment $2; that is, compare $(1-p)(\$5) > \$2$. Since $(1-p)(\$5)$ exceeds $2 when $p = .55$, society's wealth is enhanced if the victim invests to identify the taker's type.

[142] Under these assumptions, if the victim makes a high-price strategic demand the value of his bicycle falls by some amount. Suppose it falls by $2. The payoff to making a high demand is then (.55)($24) + (.45)(-$2) = $12.3. The payoff to identifying the taker's type is $13. In this case, the victim will prefer to pay $2 to identify the taker's type rather than make a high-price strategic demand. In general, in this example, a reduction in the entitlement's value (to the victim) of only .44 is sufficient to induce the victim to invest $2 to identify the taker's type.

certain settings where bargaining occurs. The bargaining rule has the effect of conditionally restricting the entitlement in a way that gives the holder an incentive to avoid strategic conduct.[143] One can think of this conditional restriction as either creating a stick or a carrot. If one views it as a stick, the restriction of the entitlement creates an in-built penalty that falls when the entitlement holder acts in a particular strategic fashion. Viewed as a carrot, the division creates an incentive for the entitlement holder to act in good faith in order to preserve the value of the entitlement.

As I said before, labor law appears to be the only area of the law in which bargaining rules are observed. Labor law is an appropriate area for such a rule to be devised, because it is perhaps the only field of law in which courts actually regulate the bargaining process. Labor courts are forced, by the cases that come before them, to directly confront issues such as strategic conduct, incomplete information, and the sharing of the bargain surplus.

The specific bargaining rule that has emerged in labor law prevents the employer (the relevant entitlement holder in most cases) from making a unilateral decision with respect to some entitlement until he has first reached an impasse after bargaining in good faith.[144] If the employer has not reached an impasse, or has bargained in bad faith, he is

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[143] Although the description of a restricted entitlement seems similar to the divided entitlement concept by Ayres and Talley, the argument here is quite different from theirs. As Kaplow and Shavell note, the Ayres and Talley paper focuses on the choice between property rules and liability rules. Kaplow and Shavell, supra note 8, at 785-786. The liability rule, in the Ayres and Talley analysis, is itself a type of entitlement division. Entitlement division in their analysis reduces incentives to act strategically because a seller of entitlement realizes that he might become the buyer. Ayres and Talley, supra note 8, at 1030-31. In my analysis, the conditional bargaining rule is a modified property rule, not a liability rule. It conditions use of the entitlement on satisfaction of certain obligations, but at no point does it threaten to transfer the entitlement to the other party.

[144] NLRB v. Katz, 369 U.S. 736 (1962); see also, Robert A. Gorman and Matthew W. Finkin, Basic Text on Labor Law: Unionization and Collective Bargaining 600-604 (St. Paul, Minn: West Publishing, 2d ed. 2004).

forbidden from acting unilaterally.[145] Suppose, for example, the employer wants to reduce wages by $1 per hour. The employer must first bargain with the union in good faith. It is a violation of that duty to bargain if the employer simply reduces wages without bargaining, or if the employer bargains in bad faith.[146] The example discussed in this section illustrates how the bargaining rule observed in labor law could enhance efficiency. The bargaining rule, if implemented well, could induce employers to bargain in an effort to sincerely meet the legitimate demands of the employees rather than gain a strategic advantage.

Conclusion

This paper has reexamined the economics of property and liability rules, a topic introduced in the seminal article by Calabresi and Melamed. In recent years, a new literature has emerged applying a rigorous analysis of bargaining incentives to the topic. The new bargaining theory literature has greatly advanced the theoretical analysis of property and liability rules. However, the bargaining theory literature has also suggested that the fundamental proposition of the Calabresi-Melamed article, that property rules are superior on welfare grounds to liability rules when transaction costs are low, is invalid. Using an informal model of bargaining between a taker and a victim, I have shown that the fundamental proposition remains valid. However, the informal model presented here, like all models, has pointed a beam of light at one key premise of the theory that had apparently been underemphasized or ignored in the recent literature; that property rules protect the subjective valuations of entitlement holders while liability rules do not. The

[145] Gorman and Finkin, supra note 144, at 600.
[146] Id. at 601.

failure of liability rules to protect subjective valuations gives rise to litigation and costly efforts to avoid expropriation (or to engage in expropriation), reducing society's wealth. This is the core reason that the fundamental proposition regarding property rules remains valid and the positive legal theory based on the proposition – e.g., Posner's "market-bypassing" theory of criminal law doctrine – remains valid as well.