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SOME NOTES ON PROPERTY RULES, LIABILITY RULES, AND CRIMINAL LAW

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Some Notes on Property Rules, Liability Rules, and Criminal Law

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Abstract: The property-liability rules framework, which offers a robust positive theory of criminal law, has come under attack in recent years. One critique, which I label the Indifference Proposition, argues that property rules and liability rules are equivalent in low transaction cost settings. In this paper I examine the conditions under which the Indifference Proposition is valid. In several plausible low transaction-cost settings the proposition is not valid.

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Property rules prohibit conduct and liability rules internalize costs.¹ Using this distinction, criminal law can be described as a set of property rules. The law aims to prohibit offensive activity altogether rather than regulate it to some optimal level. In other words, criminal law assumes that there is no “optimal level” of offensive activities such as fraud, rape, and robbery.

In view of this, one should expect the property-liability rules framework set out in Calabresi and Melamed (1972) to point the way toward a robust positive theory of criminal law. Posner (1985) applies the property rule theory to explain criminal law at a high level of detail. No other article has attempted such a complete survey of the criminal law grounded in positive theory.²

The value of the property-liability rules framework has come under attack in recent years. Kaplow and Shavell (1996) present perhaps the most troubling critique. They argue that property rules and liability rules are equivalent, in low transaction cost settings, in terms of their welfare implications.³ The reason is that takings will not be observed under either property rules or liability rules.⁴ I refer to this below as the *Indifference Proposition*.

In this paper I reexamine the Indifference Proposition. I have argued before that even on its own terms the Indifference Proposition does not imply that property rules and liability rules are equivalent in their welfare implications, and that the Indifference Proposition depends on rather special conditions (Hylton, 2006). I argue here that the Indifference Proposition is invalid, and that, unlike property rules, takings will be observed under liability rules in low transaction cost settings.

In particular, in several plausible low transaction cost settings, takings will occur under the liability rule, violating the Indifference Proposition. The variations on the low transaction cost setting involve defensive conduct, predatory conduct, and bounded rationality.

I also explore the role of informational asymmetry in a simple model of takings. The liability rule is often ideal under informational asymmetry because it can enable efficient transfers in spite of the informational disparity.⁵ But if property is more valuable to the acquiring party under the property rule than under the liability rule, because transfers occur without risk of subsequent disputes over title, then informational asymmetry can result in takings under the liability rule, even under conditions in which takings would be unlikely. This is another scenario in which the property rule is socially preferable to the liability rule.⁶

In the final part of this paper I summarize the implications of the property and liability rules framework for criminal law. The defense offered here for property rules provides a stronger foundation for the positive economic theory of criminal law.

I. Theory and Illustration

I will use an example to illustrate my argument. The setting I consider consists of possessors and acquirers. As the labels suggest, possessors own some object that the acquirer wishes to possess. The acquirer has a choice to bargain for and purchase the object from the possessor in an arms-length transaction, or take the object from the possessor.

Assume the possessor has a bicycle worth \$75 to him. Assume there are two types of acquirer: one values the bicycle at \$100 (high-valuing acquirers) and the other type values the bicycle at \$25 (low-valuing acquirers).

The state has a choice with respect to enforcement of possession rights. It can apply a liability rule, which consists of a fine that will be imposed on the acquirer. Alternatively, the state can apply a property rule which simply prohibits takings. If the acquirer takes the bicycle, the state will enforce the law (whether under the property rule or under the liability rule) at a cost of \$10 for each instance of enforcement.

If the state adopts the liability rule approach, the optimal fine for taking a bicycle is equal to the sum of \$75 and \$10, or \$85. This fine internalizes to the acquirer the social cost of taking bicycles, which consists of the monetary injury to possessors and the enforcement cost borne by the state. A policy of imposing a fine of \$85 on acquirers who take bicycles will ensure that only those acquirers whose subjective valuations exceed the social cost of a taking will actually take a bicycle. In other words, only those takings that enhance society's wealth will occur.

Obviously, the state could set the fine at some level other than the optimal level. But in order to evaluate the choice between the property rule and liability rule, I will confine myself to the optimal fine. This ensures that the comparison is based on the most efficient liability rule regime. If I compare the two rules on the assumption that the state chooses a suboptimal fine level, that obviously would bias the analysis in favor of the property rule.

If the state adopts the property rule, it can implement it through more than one approach. It can prohibit takings and incarcerate all acquirers who violate the rule. Or the state can impose a fine of at least \$100 on any taking, which will remove any gain that an acquirer could enjoy as the result of a taking. Whatever approach the state takes, I will assume that it is effective in completely deterring takings. Takings will therefore not occur under the property rule.

A. High Transaction Cost Setting

First, consider a setting in which transaction costs are so high that no acquirer would consider bargaining for a bicycle; bargaining is too costly and time consuming. Acquirers will obtain bicycles only through taking.

Under the liability rule only those acquirers whose valuations are equal to \$100 will take bicycles. The acquirers whose valuations are equal to \$25 will not take bicycles. The reason is that if such an acquirer takes a bicycle, he will have to pay a fine of \$85, which results in a negative return.

Each taking by a high-valuing acquirer delivers a social dividend of \$15 (\$25 less the cost of enforcement \$10). Thus, the liability-rule enforcement policy permits society to reap this dividend on every taking. Society has no interest in permitting takings to occur involving low-valuing acquirers because the gain they receive is less than the monetary loss imposed on the possessors.

If all of the acquirers were low-valuing types, the penalty of \$85 would deter them from taking bicycles. But since the social dividend is negative for any taking involving a low-valuing acquirer, society could just as well accomplish the same outcome with a penalty set at \$1 million. The important point is that society prefers to completely deter takings by low-valuing acquirers.

Now consider enforcement under the property rule. Under the property rule, no acquirers will ever take bicycles. This means that society forfeits the social dividend that is generated by the takings that occur between high-valuing acquirers and possessors.

It follows that the liability rule is preferable to the property rule when transaction costs are high. Under both rules, no takings occur between low-valuing acquirers and possessors. Takings occur between high-valuing acquirers and possessors only under the liability rule.

Obviously, if we consider any less efficient liability rule regime, such as one in which the penalty is set at \$1 rather than \$85, the superiority of the liability rule becomes less clear.

B. Low Transaction Cost Setting

In the low transaction cost setting acquirers have the option of bargaining for and purchasing the bicycle rather than taking it. To simplify, I will assume that the transaction cost is zero – that is, that no resources are consumed by the act of bargaining between acquirer and possessor.

If high-valuing acquirers make deals with possessors, those deals will involve the transfer of a bicycle for some price between \$75 and \$100. The surplus to the acquirer will be \$100 minus the price; the surplus to the possessor will be the price minus \$75. The total social surplus in every such transaction will be \$25.

Obviously, low-valuing acquirers will never acquire a bicycle through a voluntary bargain. They will offer a bid of \$25 and the possessor will turn it down.

The outcome under bargaining (low transaction cost) is preferable to the outcome under the liability rule with high transaction costs. In the high transaction cost setting, takings occur between high-valuing acquirers and possessors, with each delivering a social dividend of \$15. However, when the parties can bargain cheaply, acquirers and possessors enter into voluntary deals, and the social dividend is \$25 per voluntary transaction.

But there is no guarantee that only voluntary transactions will take place. That depends on the enforcement rule.

If the state adopts the property rule, no takings will occur, and only voluntary transactions between high-valuing acquirers and possessors will be observed – again with each transaction generating a surplus of \$25.

If the state adopts a liability rule, the matter is more complicated. The traditional view reflected in the Calabresi and Melamed article and in the Posner article is that takings will occur under a liability rule. Some high-valuing acquirers will take bicycles, generating a social surplus of only \$15 (\$25 transfer surplus – \$10 enforcement cost) for each taking. Indeed, any time a possessor demands a price greater than \$85 for the bicycle, the acquirer will take.

On the assumption that takings occur under the liability rule regime, the property rule is preferable to the liability rule. The reason is that voluntary transactions, which are the only transactions that occur under the property rule, generate a social dividend of \$25. This is greater than the social dividend from a taking under the liability rule regime, which is \$15. This is the core of the case for the property rule in Calabresi and Melamed.

II. Indifference Proposition

Kaplow and Shavell argue that *takings will not occur* under the liability rule.⁷

Reconsider the bargaining environment. The high valuing acquirer will approach the possessor and offer to purchase. The possessor will state a price. Suppose the possessor offers a take-it-or-leave-it price to the high-valuing acquirer. In order to examine the robustness of the Kaplow-Shavell argument, I will consider it first under the assumptions of the previous section – specifically, that the liability rule penalty forces the acquirer to bear the enforcement costs.

Second, I will assume that the liability rule penalty does not force the acquirer to bear the enforcement costs.

A. Acquirer Bears Enforcement Cost

The possessor knows that he cannot set the price too high. If he sets the price at \$99, the high-valuing acquirer will take. The reason is that he will get a surplus of only \$1 if he purchases at \$99; but if he takes the bicycle, he will get a surplus of \$15 ($\100 value – $\$85$ fine). Clearly the high-valuing acquirer will take if the possessor demands \$99.

Suppose instead the possessor demands only \$76. Then the acquirer will reason as follows: I can purchase the bicycle for a surplus of \$24 ($\$100 - \76), or I can take the bicycle for a surplus of \$15. In this case the acquirer will purchase. If the acquirer purchases, the possessor gets a surplus \$1. If the acquirer takes, the possessor gets no surplus.

The acquirer will prefer to purchase for any price less than or equal to \$85, and will take when the price is higher than \$85. The possessor will be better off selling at any price greater than \$75 and less than or equal to \$85 than he would be in the event of a taking. It follows that a transaction will take place for a price less than or equal to \$85 and greater than or equal to \$75. No takings will occur under the liability rule.

B. Acquirer Does Not Bear Enforcement Cost

The foregoing argument should be reconsidered under the assumption that the cost of enforcement is borne by the state instead of the acquirer (in the form of an addition to the fine). If the cost of enforcement is borne by the state, the liability rule fine will be \$75. The only way

that a transaction will take place is if the possessor is willing to sell for \$75, which is the value the possessor places on the bicycle. In this case, there is a single objective transaction price.

A plausible assumption is that in this scenario, when transactions can take place only at a price at which the possessor is indifferent as between a sale and a taking, that the possessors will choose randomly; some bicycles will be sold (because the possessor set his price at \$75) and some will be taken (because the possessor refuses to sell at \$75). This is the approach adopted in Hylton (2006). However, suppose all possessors choose to sell at \$75. In this scenario, no takings will occur, and all bicycles will sell at the \$75 price.

C. Informational Asymmetry

Although the low transaction cost setting was assumed in Calabresi and Melamed to exclude informational asymmetry, the preceding arguments do not necessarily fall apart when informational asymmetry is introduced. The claim that no takings will occur under the liability rule may still continue to be valid in the presence of informational asymmetry.

First, consider the case where the state bears all enforcement costs. A transaction could occur at only one price, when the price is equal (in monetary value) to the liability rule penalty. In this case, informational asymmetry would not affect the outcome. Everyone knows the liability rule penalty. If the possessor sets his price above the penalty, high-valuing acquirers will take.

Second, consider the case where the acquirer bears the enforcement costs (as assumed in the example of the previous part). Informational asymmetry becomes an issue in this scenario only if there are some acquirers whose valuations fall within the contract range, between \$85 and

\$75. If there are no acquirers of this sort, informational asymmetry is again an irrelevant factor. No takings will be observed.

D. Summing Up

Putting the previous subsections together leads to the following conclusions. First, as long as some portion of the enforcement cost of enforcement is borne by the acquirer, then all bicycles will be transferred through market transactions and no takings will occur. Second, even if no portion of the enforcement cost is borne by the acquirer (because the state bears the full enforcement cost), no takings will occur if the possessor, whenever indifferent between a sale and a taking, always chooses to sell. With these two conclusions accepted, the Kaplow-Shavell argument is complete.

From this argument, Kaplow and Shavell conclude that the property rule and liability rule have equivalent welfare implications in the low transaction cost setting. I will state their result as follows.

Indifference Proposition: If transaction costs are low, takings will not occur under property rules and under liability rules. Society should therefore be indifferent as between the two rule types.

At first glance the Indifference Proposition is startling, with troubling implications. The traditional view of Calabresi and Melamed, that takings will occur under liability rules and will not occur under property rules, had been accepted in the literature. The Indifference Proposition implies that the basis for favoring property rules in low transaction cost settings is weak, or

nonexistent. If that is correct, then the property-liability rule framework falls apart as a positive theory of common law.

The Indifference Proposition is an implication of the Coase Theorem (Coase, 1960). If transaction costs are low, according to the Coase Theorem, parties will bargain themselves to the most efficient allocation of resources. It follows that under low transaction costs the most efficient allocation of resources will be observed whether the property rule or the liability rule is in effect. Of course, the most efficient allocation of resources would be observed in the end whether or not takings occurred. When takings occur, however, there is, in effect, a joint decision by the possessor and acquirer to “burn” money. A taking is, in the low transaction cost setting, an agreement to waste resources through the enforcement action. The most efficient transaction is the voluntary transaction. Hence, if transaction costs are low, the parties should always opt for the voluntary transaction. For the remainder of this essay I will examine the limitations of this argument.

III. Why Society Should Not be Indifferent as between Property Rules and Liability Rules

In this part I will explore the reasons society should prefer the property rule to the liability rule in the low transaction cost setting. The general reasons can be put initially into two categories. First, even if the Indifference Proposition were valid, society should still prefer the property rule to the liability rule.⁸ Second, I will discuss the reasons that the Indifference Proposition is invalid.

A. Preferring Property Rules When the Indifference Proposition is Valid

Under the Indifference Proposition, no takings occur under the liability rule, contradicting Calabresi and Melamed (1972). Efficient transfers occur, in the sense that the bicycle gets traded to the agent who values it the most. However, even though only “voluntary” trades occur, these are essentially trades made under duress.

There is an additional implication for the prices that will be observed in the low transaction cost setting when the liability rule is in effect. The maximum transaction price that will be observed under the liability rule regime is the liability rule penalty. The total wealth transfer from possessors to acquirers will be determined in large part by the liability rule penalty. As the penalty is set lower, more wealth is transferred from possessors to acquirers.

In the example considered in the previous part of this paper, I assumed that acquirers consisted of two types, while the possessors simply valued their bicycle at the market value of \$75. Suppose, however, that possessors have heterogeneous subjective valuations. For example, suppose there is a subgroup of possessors that values their bicycles at \$90 each. In this scenario, it is still the case that no takings occur under the assumptions of the Indifference Proposition. High-valuing possessors agree to sell their bicycles for a price no greater than \$85, because they would rather receive some surplus over the market value as the result of a sale, rather than no surplus at all when a taking occurs. But even when these sales occur, the high-valuing possessor receives a price that is less than his subjective valuation. This has troubling implications.

When voluntary sales are made, as predicted by the Indifference Proposition, merely to avoid a taking under the liability rule, possessors are not compensated for losses in subjective value in these transactions. That has long term implications for investment. A high-valuing possessor may have a large subjective valuation because he has made some sort of investment that cannot be easily valued by the market, or which may have no value in the market. For

example, suppose a high-valuing possessor has painted his bicycle a special color. Some market participants would prefer to buy a bicycle of that special color, while an equal number would not prefer to buy such a bicycle. The objective market therefore places a zero value on the bicycle's color. Still, even in this case, the possessor may have an expectation of waiting and finding a buyer who prefers the special color and receiving a premium in a transaction as a result. This will not happen under the liability rule, because all acquirers know that they can simply take the bicycle whenever the asking price exceeds the liability rule penalty level.

Knowing that subjective valuations in excess of the market will not be compensated, possessors with substantial subjective valuations, or who anticipate a substantial subjective valuation arising from some future investment, will change their plans to avoid a transaction that imposes a subjective loss. Some will avoid settings in which market exchanges may be forced on them, unless compelled to enter by some uncontrollable change in events. Some will avoid the investment that creates the subjective valuation, since they know that the investment is unlikely to be rewarded in the future.

These actions are harmful to long run social welfare. Again, consider the simple example of the possessor who paints his bicycle a special color. Suppose he has already done so. Knowing that he might eventually find himself in a position where it is privately optimal, under the conditions, to sell his bicycle at a price that he considers beneath his subjective valuation, he may attempt to avoid all settings in which this might occur. He may decide to hide his bicycle in a secret location, and to ride it only in places where he will never run into potential acquirers. Possessors with high subjective valuations may self segregate in order to avoid market transactions. All of this is costly and reduces welfare. Alternatively, suppose the possessor has not painted his bicycle, but is merely thinking about it. He will do so only if he can find a way to

secure its possession in the future. If he cannot secure its possession, he may forgo painting even though the subjective valuation increment from painting far exceeds the cost of painting. This is harmful to social welfare too.

Conversely, consider the incentives of potential acquirers. Knowing that they can simply take a bicycle when the possessor's price exceeds the liability rule penalty, high-valuing acquirers will have every incentive to invest in technology that facilitates taking. These investments would serve no useful purpose to society; they merely facilitate the transfer of resources from one person to another. Social welfare is reduced as resources are drawn into the takings process.

These are sufficient reasons to reject the Indifference Proposition, and to prefer the property rule to the liability rule when transactions costs are low. However, I will argue below that when one looks closely at transaction costs and the takings process, the case for preferring property rules gets even stronger.

B. Reasons Why the Indifference Proposition Fails

In this part I will examine in more detail the transactions that are assumed to occur under the Indifference Proposition. The Indifference Proposition holds that property rules and liability rules are equivalent in terms of welfare when transaction costs are low (zero). Of course, there is no definition of precisely what is meant by low transaction costs. The definition that works best in terms of the Coase Theorem is one that is perfectly circular: low transaction costs means any setting in which there is no feature of the environment that prevents the parties from reaching the efficient agreement. The circularity approach has to be set aside to make progress on this issue.

I will break the notion of transaction costs down into different components: primary and secondary. Primary transaction costs are the cost of meeting. Secondary transaction costs are the costs of reaching agreement after meeting.

For example, consider accidents between strangers, such as automobile collisions. The parties cannot bargain *ex ante* over the allocation of risk because the cost of identifying the bargaining parties and meeting before the accident are prohibitively high. This is a case in which bargaining does not occur because primary transaction costs are too high. When the primary transaction costs are low, and the parties can meet easily, there may be secondary transaction costs that prevent them from reaching an agreement. Those costs can take the form of strategic hold out incentives, information asymmetry, or behavioral norms that pose obstacles to agreements.

I will assume below that primary transaction costs are low. The remaining costs, secondary transaction costs, may not be low. The presence of secondary transaction costs suggest that property rules are preferable to liability rules when primary transaction costs are low.

Return to the basic story. Why do takings *not* occur under the liability rule? Because the possessor, realizing that a taking will occur if he sets his asking price too high, will set his asking price at a sufficiently low level to avoid the taking. The possessor and acquirer agree at first to bargain. When they meet to bargain, the possessor realizes that the law has given the acquirer an option to take whenever the possessor's asking price goes above the level of the liability rule penalty. The liability rule penalty is, in effect, a "strike price" that triggers a taking. Realizing this, the possessor knows to keep his asking price below the strike price set by the law.

As a description of bargaining, this is inconsistent with behavioral patterns. I will consider the implications of cognitive dissonance, bounded rationality, predation, defensive actions, and asymmetric information below. Each of these factors easily can prevent the Indifference Proposition from being valid. Of course, informational disparities have been treated as another type of transaction cost.⁹ Predation and defensive actions, however, would appear to be a feature of the bargaining environment even in low transaction cost settings. The prospect of these factors indicates that the Indifference Proposition is invalid even under the most expansive noncircular definition of transaction costs.

A. Behavior, Cognitive Dissonance, and Bounded Rationality

When people choose to bargain, they generally commit themselves to the notion that they will bargain, and that if the bargaining fails, in the sense that no transaction takes place, they will walk away with the same endowments that they carried into the bargaining session (Hylton 2006). I am aware of no real life scenarios in which individuals engage in conditional bargaining where if the seller proposes terms that fall outside of certain parameters the prospective acquirer abandons the bargaining process and resorts to expropriation.

Perhaps the closest example of conditional bargaining in American law is observed in collective bargaining as required by the labor laws. In the union bargaining process, the parties are required by law to bargain until an impasse is reached. After an impasse, the employer is allowed under the law to make unilateral changes in working conditions. This is a case of conditional bargaining, because the employer bargains knowing that if the union demands too much, he will simply reject the demand and implement the change he prefers. But in this case, it is the employer exercising his common law property rights after the impasse stage. The law does

not permit one party to take part of the common law property rights package from the other after the impasse stage.

Probably the closest examples of conditional bargaining are observed not among individuals, but among governments on the international relations stage. China wants Taiwan to reunify by becoming part of China. The Chinese government asks politely and even enters into trade agreements, but at the same time fortifies missile batteries aimed directly at Taiwan. The clear signal China sends is that this is a bargaining game that could end, at any time, with a taking. The signal is designed to pressure Taiwan not to set its terms for reunification too high. Although this is a valid example of conditional bargaining, it also illustrates how rare the conditions must be for such bargaining to be observed. The international relations stage is unique precisely because there are no property rights enforced by a super-government, while at the same time there are boundaries long recognized by custom. These conditions are unlikely to be observed among individuals within a community. If property rights are not enforced in a community, many individuals would resort to taking, without wasting any time on bargaining. Those who attempted conditional bargaining would be victimized by the many others who resorted to taking.

Bargaining is common in open air markets and in car dealerships. The norm that is uniformly followed is simple. The seller offers a price and the prospective buyer counters with lower prices. But the seller never does so with the expectation that the prospective buyer will take if the seller puts his asking price too high. The understood bargaining ritual is one in which the parties commit to the process, under the assumption that if it fails they retain their current endowments. This appears to have been the behavioral norm in all societies, at all times.

Given that bargaining is a process to which actors commit, the cognitive dissonance problem is easy to see. Suppose the possessor shows up to the bargaining table, assuming that the acquirer is committed to bargaining. The acquirer, suspecting that the possessor will not respect the trigger price limit, has no incentive to bargain. The acquirer's best move would be to take immediately, rather than waste time in a failed bargaining process. Takings rather than bargains would occur, and society would waste resources on enforcement in response to the takings. The Indifference Proposition would fail to hold, and property rules would be preferable to liability rules.

Of course, one response to this argument is that it reflects the way people have thought, given the existence of the property rule. If property rules had never existed, or had never been widespread, possessors would have no reason to enter into bargaining sessions in the belief that the acquirer was committed to bargaining. If liability rules were the norm, each possessor would anticipate a taking whenever he set his asking price above the liability rule penalty.

This is a suitable response, but it raises new issues, related to bounded rationality. Suppose one of the parties makes a mistake, and fails to learn the precise level of the liability rule penalty. If one of the parties has a mistaken understanding of the liability rule penalty level, takings will occur because of errors in the bargaining process. Specifically, the possessor will set his price at a certain level, thinking it below the liability rule penalty, and the acquirer will take because he thinks the price is above the liability rule penalty. One or both parties may be mistaken.

Is it reasonable to assume that bargaining parties will always be aware of the liability rule penalty? Probably not. At best, both sides may have rough guesses. Takings will occur

because there will inevitably be instances in which at least one bargaining party does not have perfect information with respect to the liability rule penalty.

The practice of bargaining with entitlements intact appears to be the norm across societies. Why this is so is a subject worthy of study. The bounded rationality theory may be a key reason for the prevalence of property rules (Smith, 2004). Imagine a mixture of property and liability rules applied in low transaction cost settings – for example, property rules for cars, liability rules for bicycles. The conditional bargaining strategy envisioned in the Indifference Proposition requires the parties to know what kind of bargaining process they have entered. This would be a costly and unworkable system of administration. The bounded rationality argument indicates that one of the key functions of property rules is to economize on the information necessary for markets to exist.

One could argue that the bounded rationality assumption takes us outside of the low transaction cost setting. But bounded rationality is such a primitive feature of the human condition that it would be strange to assert that the low transaction cost assumption requires perfect information and perfect ability to process all information. As a theoretical construct useful for analysis, the setting of low transaction costs should at least be consistent with observed human capacities. When the construct of low transaction costs is completely divorced from any notion of human capacities, it serves then only as an assumption that guarantees the efficient Coasean solution in all settings. But once reduced to that status, it no longer serves a useful purpose.

B. Predation

It may be rational for acquirers to create a reputation for predation (Milgrom and Roberts 1982). With such a reputation, they will be able to extract a larger share of wealth from the possessors.

Return to the bargaining scenario envisioned in the Indifference Proposition. Suppose the acquirer is a repeat actor, in the sense that he knows that he will meet with other possessors in the future and attempt to acquire bicycles from them. Or, suppose the acquirer is the member of some group or club that transacts with possessors. Under these assumptions, predation may be a rational strategy.

The possessor's reason for engaging in predation runs as follows. If he is a one-shot actor, it will always make sense for the acquirer to accept any price that is less than or equal to the liability rule penalty. Given such a price, the threat to take the bicycle will not be credible. But if he is a repeat transactor, he may reason that if he establishes a reputation as a taker, he will be able to push the possessor down to the lowest price at which the transaction still has value to the possessor. He may reason that he is better off in the long run by suffering a few losses early by taking and then paying the liability rule penalty, because that enables him to establish a reputation as a taker. Once the reputation is established, he will find that in future bargaining sessions, possessors will cut their prices to the bottom end of the bargaining range. In the long run, he profits from the reputation, which enables him to expropriate more wealth from possessors.

The same reasoning applies if the acquirer is a member of club or from some identifiable region or population subgroup. A few unprofitable takings may be profitable in the long run by building up reputation capital for the group. Once the group is known to consist of takers, possessors will cut their prices immediately when bargaining with them.

Given the likelihood that predation would arise as a rational strategy under the liability rule, takings will occur. This implies that the property rule is preferable to the liability rule.

C. Defense

Another problem that the Indifference Proposition fails to take into account is defensive action by the possessor. Recall that the story behind the Indifference Proposition is a bargaining process in which the acquirer shows up to the bargaining table ready to take, and the possessor shows up ready to be victimized. But why would the possessor walk into the bargaining process expecting to be victimized? Why wouldn't the possessor take steps to avoid victimization? If the possessor could take a defensive action that cost \$1 in order to avoid an expropriation of \$2, he would do so.

Reconsider the bargaining story. Suppose the possessor values the bicycle at \$95 and the acquirer values it at \$100. The liability rule penalty is set at \$85 (the sum of the bicycle's market value \$75 and the enforcement cost \$10). In the original Indifference Proposition scenario, the possessor realizes that he is better off setting his price at \$85 and losing \$10 (the difference between his reservation price and the actual transaction price) in a voluntary transfer rather than setting his price at \$95 and losing the full amount. In either enforcement scenario, the possessor loses more from a taking followed by enforcement than from a voluntary transfer at the price determined by the liability rule penalty. But the possessor may be able to do better by adopting some defensive measure.

Suppose the possessor invests \$1 into a technology that electrically shocks the acquirer when he attempts a taking. The shock does not prevent the taking, it merely imposes a cost. Suppose the cost of the shock, from the perspective of the acquirer, is \$12. Now if the acquirer

attempts a taking, he will have to “pay” \$12. After he has taken the bicycle from the possessor, the acquirer will be prosecuted for the penalty of \$85. Under these conditions, the acquirer will accept a voluntary transfer for any price less than or equal to \$97. Again, no takings will occur, as the Indifference Proposition predicts. But neither is the possessor expropriated.

Although no taking occurs in this example, the property rule is unambiguously preferable to the liability rule. The reason is that the liability rule induces defensive expenditures that would not be observed under the property rule. Social welfare is greater under the property rule than under the liability rule.

One could argue that a Coasean solution is still possible in this scenario. Suppose the acquirer, realizing that the possessor has the option to invest in a defensive technology, approaches the possessor before the possessor obtains the defensive technology. In this setting, the acquirer can offer to share a larger part of the bargaining surplus with the possessor in exchange for the possessor forgoing the defensive technology. Under this Coasean bargain, the Indifference Proposition reemerges, and no taking occur.

The problem with this Coasean solution is that it requires some especially strong assumptions. After the possessor forgoes investment in defense, what would prevent the acquirer from renegeing on his promise to share a larger part of the bargaining surplus? Nothing. Unless the acquirer could commit to his promise to share, the possessor would have no incentive to accept a deal in which he forgoes investment in defense. For the Indifference Proposition to be valid, some especially strong assumptions regarding commitment and trust would have to be valid also. Moreover, these assumptions would appear to violate the individual rationality assumption at the heart of this framework (Hylton, 2011).

D. Information

Information asymmetry provides yet another basis for rejecting the Indifference Proposition. At first glance, informational asymmetry appears to be an unlikely reason for preferring property rules over liability rules. Informational asymmetry often provides a basis for preferring liability rules to property rules. More generally, informational asymmetry makes it difficult to determine whether property rules are socially preferable to liability rules.

In the story behind the Indifference Proposition, the acquirer decides whether to take the possessor's bicycle by comparing the surplus he would gain from a taking with the surplus he would gain from a voluntary transfer. The comparison is made by the possessor in deciding whether to transfer voluntarily or reject a deal.

As I argued in Part II.C., informational asymmetry does not necessarily play a role in this story. For example, consider the case where there is a single, observable, objective price at which the transaction can take place. Both parties compare their own reservation values to the objective price in order to determine whether a taking or a trade will occur. In the model considered above, the single objective price is equal to the liability rule penalty. However, I will show in this part that informational asymmetry may play a role in determining whether a taking will occur, even under assumptions that are most favorable to the no-takings conclusion (Part II.C.)

Let V_a be the value that the acquirer places on the bicycle. The acquirer takes whenever

$$V_a - F > V_a - p, \quad (1)$$

or when

$$p > F. \quad (2)$$

Given the rule determining when the acquirer takes, the possessor will avoid a taking by setting price equal to the penalty ($p = F$). Thus, informational asymmetry plays no role in determining whether a taking will occur.

But this model is incomplete. The value of a bicycle to the acquirer is likely to depend on the process by which it is transferred. If the bicycle is transferred voluntarily, the former possessor will relinquish all claims on the bicycle. In regimes that record ownership, the former possessor will transfer formal documents registering title to the acquirer. More importantly, the former possessor will not attempt to recapture the item.

The situation is different when the acquirer obtains the bicycle by a taking. The possessor will not relinquish all claims to ownership. He will retain formal documents proving ownership, which could cast a legal cloud over the acquirer's new possession. The possessor will attempt to recapture the item whenever the opportunity presents itself.

In light of these differences, the value of the bicycle to the acquirer should depend on whether he acquires it through a voluntary trade or through a taking. Thus, the decision to take is governed by

$$V_{al} - F > V_{ap} - p \quad (3)$$

Where V_{al} is the value of the bicycle to the acquirer when it is taken, and V_{ap} is the value of the bicycle when it is obtained in a voluntary transaction.

This complicates matters. In the original version of the Indifference Proposition account, informational asymmetry played no role in the bargaining process because the decision to take was governed completely by the relationship between the transaction price p and the liability rule penalty F . The equilibrium was one without takings because possessors set $p = F$. If a possessor demanded $p > F$, his bicycle would be taken. If a possessor demanded $p < F$, he would be forfeiting surplus. So the possessor avoided takings by setting $p = F$, and no takings occurred. However, in this more complicated version, possessors can no longer avoid takings by setting the transaction price equal to the liability rule penalty.

I will provide an intuitive account of the bargaining process in this more complicated version. Suppose, to simplify, the value of the bicycle to the possessor when obtained through trade is related by a fixed ratio the value when obtained through a taking:

$$V_{al} = kV_{ap} \tag{4}$$

Where k is less than one because the value of the bicycle is worth less when taken than when it is obtained through a voluntary trade. Takings occur when

$$kV_{ap} - F > V_{ap} - p \tag{5}$$

or when

$$p - F > (1 - k)V_{ap} \quad (6)$$

By keeping the price low the possessor can avoid a taking. But he has room to raise the price above the liability rule penalty because the surplus from the taking is generally less than the surplus from the voluntary trade. Indeed, the possessor can safely avoid a taking and earn a bit of the surplus by setting his price equal to the liability rule penalty plus the additional surplus gained from a voluntary trade $(1 - k)V_{ap}$. If the possessor knows the reservation valuation of each acquirer, he can set a price that extracts the additional surplus of each transaction and also avoid the taking.

In an informational asymmetry setting, the possessor will not be able to exploit the surplus differential of each acquirer. He could use the average as a basis for setting his price, though that will lead to takings.

The possessor will be able to exploit the bilateral monopoly relationship between the possessor and the acquirer. Suppose the reservation values of acquirers are unknown to the possessor, although the possessor knows the distribution of reservation values. In this case, the possessor is in the same position as a monopolist who knows the demand curve but does not know the reservation price of each counterparty. He will trade off raising the price and scooping out additional surplus from the bargain with reducing the price and suffering a taking. The price that he sets will lead to some takings.

Again, the property rule is preferable to the liability rule. Takings occur under the liability rule, but not under the property rule. The property rule avoids the welfare loss that results from takings.

IV. Implications for Criminal Law

The foregoing discussion has taken a close look at the Indifference Proposition, according to which no takings will be observed under the property rule *and* under the liability rule in the low transaction cost setting, and therefore property and liability rules are equivalent in terms of welfare implications. I have made several points.

First, the welfare implications of property and liability rules diverge once any one of many plausible variations on the low transaction cost assumption is considered. Consider, for example, predatory and defensive actions. The Indifference Proposition's validity depends on acquirers refusing to behave in a predatory fashion, and possessors allowing themselves to be victimized without taking defensive actions.

Once defensive investments are introduced, takings are avoided and expropriation reduced through the adoption of defensive measures by possessors. But the defensive measures, because they are costly, reduce social welfare. The property rule emerges as superior to the liability rule, since defensive measures are not necessary under the property rule. The relative inefficiency of the liability rule appears to be *more severe* in this setting than in the analysis of Calabresi and Melamed. Possessors will invest into the technology of defense up to the value of the property that needs to be defended. And defensive investment can spur countervailing investment into the technology of taking.

It would be difficult to argue persuasively that defensive actions should not be considered to be part of the low transaction cost setting. Some defensive actions will be taken instinctively, others after long thought. Thus, any model that examines conduct in a low transaction cost setting should at least take the possibility of defensive behavior into account.

Second, the Indifference Proposition's prediction that takings will not occur in the low transaction cost settings does not survive a close inspection. If we allow for standard behavioral bargaining patterns, takings will occur because possessors are likely to treat a decision to bargain by the acquirer as a commitment to the bargaining regime. Realizing this, acquirers will take rather than bargain. Alternatively, if we allow for uncertainty over the types of acquirers, and the fact that property obtained from a voluntary transaction is more valuable than that obtained from taking, the bargaining process will fail to generate voluntary transactions all of the time.

When predatory behavior is taken into account, takings are predictable events even in low transaction cost settings. Moreover, one need not assume irrational behavior on the part of predators; predation may be a rational reputation-building strategy that enables actors who wish to acquire property through the market to do so at lower prices. When the takings associated with rational predation occur, they will inevitably lead to costly enforcement actions by the state.

Finally, I should note that even if the Indifference Proposition were correct in its prediction that takings will not be observed, it does not follow that property rules and liability rules are equivalent in terms of welfare implications. Although the Indifference Proposition implies that takings will not occur, expropriation of wealth does occur through pressured transactions (or transactions under duress). No enforcement costs are incurred, given that all transfers are "voluntary", and for this reason social welfare is not reduced as a result of enforcement expenditures. But the expropriation of wealth is likely to have efficiency consequences in any setting in which fear of expropriation reduces market participation or investment by possessors.

In the end, this analysis provides a slightly more complicated defense of the property rule, but it is based on assumptions that are entirely plausible. The result is a more complete

defense of the fundamental claim of Calabresi and Melamed: that property rules are preferable in low transaction cost settings and liability rules are preferable in high transaction cost settings.

This simple proposition provides the foundation of a positive theory of criminal law and of tort law.¹⁰ Criminal law is based on the property rule model. Theft, for example, is flatly prohibited rather than regulated to an optimal level by a tort-law approach with compensatory damages.

There are two reasons property rules are observed in criminal law. One, as Posner (1985) argued, is that the takings prohibited by criminal law are generally the types that occur in low transaction cost settings. Theft and robbery are obvious examples. Most thieves and robbers have the option to approach their intended victim and seek a voluntary transaction. Their offenses can therefore be viewed as efforts to “bypass the market” (Posner, 1985, at 1196). Although it requires a rather special perspective, battery and rape can also be described as market-bypassing offenses. Since the batterer and the rapist can find markets to satisfy their preferences, their choice of involuntary victims can be viewed as a type of taking. The victims are likely to set an infinite price in a hypothetical transaction, but that does not justify the taking; it merely shows that there is no price at which the transaction could be voluntary. Property rules prohibit such takings by directly enjoining them, or by imposing penalties that completely deter the activity rather than aiming merely to internalize the losses suffered by victims.

The second reason property rules are observed in criminal law is in order to completely deter activity that is virtually always inefficient, whether transaction costs are high or low. Reckless conduct falls in this category. Intentional driving in the wrong direction of a street is prohibited rather than regulated exclusively under the tort law model with compensatory damages.

Posner (1985) describes criminal law doctrine as largely built around the goal of prohibiting efforts to bypass the market. The positive theory set out by Posner is essentially the property rule framework of Calabresi and Melamed. The property rule framework explains why the internalization model observed in tort law should not be extended to criminal law, as urged by Becker (1968). More importantly, the property-liability rules framework provides a predictively accurate theory of the allocation of tort and criminal law rules (Hylton, 2005).

The arguments offered here in defense of the property rule framework seem especially applicable to criminal law. Predation, defensive behavior, and bounded rationality are all familiar features of the criminal law enforcement process. Some of the behavior is reflexive and instinctual, or reflects deep personality traits, and therefore cannot be regulated effectively by the law. Where behavior is not based on rational calculation, the law can do little other than to incapacitate the offender by separating him from potential victims.

But this chapter has advanced the argument that criminal law can be justified in terms of its impact on rational actors. Rather than ignoring common behavioral patterns in order to examine the conduct of an ideal hypothetical rational actor, who never engages in predatory conduct, I have considered a more realistic type of rational actor who behaves in a manner familiar in the crime stories. When allowing for this type of rational actor, the property rules based justification of criminal law seems clearer and stronger than in earlier analyses.

V. Conclusion

I have surveyed the reasons why property rules and liability rules are not equivalent in terms of their welfare implications in low transaction cost settings. The reasons emphasized here

are: defensive actions, predatory actions, bounded rationality. I have also examined informational asymmetry coupled with the fact that property has a greater value under the property rule than under the liability rule.

Certainly any model that provides a positive theory of law should take into account basic human behavior and characteristics that are relevant to the establishment of property rules. Defense and predation are clearly within the category of basic behavior that should be incorporated into the analysis of property rules. Bounded rationality is also a fundamental characteristic. Informational asymmetry arguably takes us outside of the low transaction cost assumption typically imposed in the analysis of property rules, but this a matter of context.

Because of these four reasons, I have argued in this chapter that property rules are unambiguously superior to liability rules in low transaction cost settings, supporting the main proposition of Calabresi and Melamed. This defense of property rules provides a sturdier foundation for the positive economic theory of criminal law.

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Notes

¹ On the theory of property rules and liability rules, see, Calabresi & Melamed (1972).

² For an effort to formalize Posner's argument, see Hylton (2005), which also provides a general survey of substantive criminal law doctrine, though not at the same level of detail as Posner's.

³ (Kaplow and Shavell 1996) at 720 ("As Coase emphasized, if there are no obstacles to the consummation of mutually beneficial bargains, it will make no difference what the legal regime is; thus, it will be irrelevant whether property rules or liability rules apply.") One distinction noted by Kaplow and Shavell is that liability rules may result in multiple takings (or threatened takings), which in the end provides a justification in their analysis for property rules. The proposition that property rules and liability rules are equivalent in low transaction cost settings was first stated in Polinsky (1980). However, Polinsky focuses on the efficiency implications of remedies rather than the incentives for takings.

⁴ See, e.g., Kaplow and Shavell (1996) at 732-33

⁵ (Kaplow and Shavell 1996) at 725.

⁶ One might respond that it is well known that, under informational asymmetry, takings can occur under the liability rule. However, I make two points in the text. The first point is that informational asymmetry does not necessarily lead to takings under the liability rule. Second, I consider a setting in which the liability rule generally "works" (in accordance with the Indifference Proposition), in the sense that no takings occur under low transaction costs, even in the presence of informational asymmetry. Then I introduce the assumption that property is more valuable under the property rule than under the liability rule, and observe that takings do occur under the liability rule.

⁷ Kaplow & Shavell (1996) at 733 (“Consider first the case in which parties always strike mutually beneficial bargains because they have perfect information about each other. In this case there is no difference between property and liability rules: bargains leading to an optimal result will always be made”).

⁸ The arguments in this part are drawn from Hylton (2006).

⁹ See Calabresi & Melamed (1972) at Part 4 text accompanying note 66.

¹⁰ For a more detailed examination of criminal law using the Calabresi-Melamed framework, see Hylton (2005).