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**Toward a Comparative Economics of  
Plea Bargaining (with Thomas  
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## Toward a Comparative Economics of Plea Bargaining

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### *Abstract*

We attempt to open a path to the comparative analysis of criminal procedure by superimposing the efficiency principle onto an adversarial system characterized by an aversion to false convictions and an inquisitorial system characterized by a desire to justly punish the guilty. We begin with a general model of plea bargaining, embed it in a larger framework that addresses the costs of adjudication, the value of punishing the guilty and the costs of false convictions, and then link the desirability of plea bargaining and compulsory prosecution to the weights given these costs and benefits in the objective function. We examine the judicial endorsement of plea bargaining in the United States and the debate over European analogs to plea bargaining in light of the model, and conclude that plea bargaining will increase social welfare in adversarial systems but not in inquisitorial ones.

**Keywords:** Plea bargaining, compulsory prosecution, criminal procedure

**JEL Classification:** K4

Following Landes (1971), formal economic analysis of plea bargaining has largely focused on the optimality properties of agreements reached in various exchange environments. Landes himself showed bargaining to be a rational response to the costs of trial for prosecutors intent on maximizing the sum of punishments imposed on defendants as a class and for defendants seeking to minimize the expected costs of punishment to them as individuals, an approach extended by Adelstein (1978) to include the dynamics of the bargaining process itself. This narrow focus on the parties was broadened by Grossman and Katz (1983) and Reinganum (1988) to consider the welfare effects of plea bargains on a society concerned with the costs of erroneous outcomes as well as material resources, and recent models by Reinganum (1993) and Miceli (1996) have begun to link plea bargaining to the larger question of optimal deterrence of crime. Though this work has produced

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several important insights, its most significant contribution has been its general elaboration of the principle of efficiency in the context of criminal procedure.

But for all its virtues, this neoclassical modeling is ill-suited to comparative analysis of legal systems, a symptom of the methodological gulf that divides the economists' prediction or prescription of quantified legal outcomes within generic institutions from the qualitative, historical inquiry into how existing institutions have evolved and how they differ from system to system that is the stuff of comparative law. In the models, the efficiency principle is normative and precisely stated: given the underlying moral and economic values that determine the costs and benefits of crime and the legal system, resources should be allocated to crime and its control so as to maximize social welfare. But real systems of criminal justice are complex webs of institutions and traditions, immersed in specific cultures and strongly conditioned by history and ideology. Even understood as social structures for the exchange of legal entitlements, they are far too decentralized and resistant to control for the normative principle to be administered, and populated as they are by fallible humans in very imperfect environments, they strain even to approach efficiency in their outcomes (Adelstein 1981a, 1999). And when we compare them, we see that differences in underlying values from culture to culture cause every system to manifest the efficiency principle in a different way.

Consider the continuing controversy among legal scholars over plea bargaining and its European analogy.<sup>1</sup> Plea bargaining is the exchange of a sentence more lenient than the defendant would receive if convicted at trial for his agreement to plead guilty and spare himself and the state the costs of the trial, which in the United States is a procedurally cumbersome and very expensive affair. For a hundred years, the vast majority of criminal convictions in the United States have been won in this way. Plea bargaining is made possible by specific institutional features of the American adversarial system: within broad limits, prosecutors have discretion to decide what charges to bring against defendants, and thus what punishments they face if convicted, whatever the facts of the case might be, and defendants have the right to plead guilty, and thus abort the trial by convicting themselves. It, or something like it, has been made necessary by the enormous number of criminal cases that American jurisdictions have had to process with very limited budgets. As a mode of case disposition, plea bargaining has been closely scrutinized by American courts since the early 1970s, its virtues as a cost saving device measured against the potential for injustice it creates in permitting defendants to be convicted without a trial, and its endorsement by the courts is an illustration of the efficiency principle in the context of the values and institutions of American criminal justice (Adelstein 1981b).

The inquisitorial systems of continental Europe, in contrast, seem immune to plea bargains. Bound by the rule of compulsory prosecution, prosecutors must bring every case to trial on the most serious charge that the evidence will support. Defendants may confess, but they cannot plead guilty; there will be a trial to establish the facts and justify the resolution of the case to the public even if the defendant admits to the charge. When it is respected, as it seems to be in almost all

cases of serious crime in Europe, the rule of compulsory prosecution amounts to a ban on plea bargaining. But the European trial is a much simpler, much less costly proceeding than its American counterpart, so many more cases can be tried on a given budget in an inquisitorial system than an adversarial one. With rates of serious crime much lower in Europe than in America, it has generally been thought possible for European systems to maintain compulsory prosecution at reasonable cost.

But in recent years, European jurisdictions have increasingly been faced with the same collision of caseloads and resource constraints that produced plea bargaining in the United States, and they too have evolved ways to divert cases from the full trial procedure toward less costly alternatives, though unlike the United States, these are generally reserved for less serious offenses. Is there, then, plea bargaining in Europe? Some, like Goldstein and Marcus (1977, 1978), observe that the European procedures perform the same function that plea bargains do and say yes; others, like Langbein and Weinreb (1978), note that European law forbids the sentence discounts that would induce defendants to use them and say no. From the neoclassical perspective, it matters little what name is attached to the trial alternatives: all that counts is that cases be diverted from the trial to the nontrial procedures efficiently, given the system's underlying values. But to the lawyers, the distinction is crucial, for it calls these very values directly into question. To make it, they must trace the roots of the evolved dispositional alternatives in each system to the older forms and customs that give the system its distinctive character and express its most basic aspirations. Is plea bargaining compatible with the fundamental values of inquisitorial systems? Can compulsory prosecution persist in an adversarial system? Concerned as it is with qualitative issues of form and description in evolving systems, inquiry of this sort is much like natural history, but one in which taxonomic judgments touch on fundamental purposes of the system and have a moral edge. To this enterprise, the neoclassical models seem to have little to contribute.

We hope to bridge this methodological divide here and thus open a path to comparative economic analysis of criminal procedure. We do this by superimposing a general version of the efficiency principle onto an adversarial system characterized by a strong aversion to false convictions and an inquisitorial system characterized by a strong desire to punish the guilty, and evaluating the relative desirability of plea bargaining and compulsory prosecution in the two regimes. We begin with a general model of plea bargaining by self-interested prosecutors and defendants, and then embed it in a larger framework that addresses the broader social objectives of criminal justice, expressed in terms of the costs of adjudicative procedures, the value of punishing the guilty and the costs of false convictions. In this way, we link the desirability of the two procedures to the weights given these costs and benefits in the objective function. Finally, we examine the judicial endorsement of plea bargaining in the United States and the debate over European procedures in light of the model, and suggest that plea bargaining will increase social welfare in adversarial systems but not in inquisitorial ones.

### 1. A general model of plea bargaining

In the model of unrestricted plea bargaining in this section, we define:

- $P_d$  = the defendant's assessment of the probability of conviction at trial;
- $P_p$  = the prosecutor's assessment of the probability of conviction at trial;
- $s$  = the dollar-equivalent to the defendant of the punishment to be imposed upon conviction at trial;
- $t$  = the dollar-equivalent cost of the trial to the defendant;
- $T$  = the dollar cost of a trial to society; and
- $b$  = the dollar-equivalent value to the defendant of the punishment imposed by a plea bargain.

In general,  $P_p$  need not be equal to  $P_d$ , due to differing beliefs held by the parties about the outcome of a trial. As we discuss below, it is this difference that creates the possibility that not all cases will end in a plea bargain. The probabilities  $P_p$  and  $P_d$  refer to the outcome of a trial on a given charge, irrespective of how the charge is determined or whether the prosecutor has the discretion to choose it, so that the subject of the plea bargain is the punishment to be imposed rather than the specific charge to which the defendant will plead guilty.<sup>2</sup> This enables us to focus the analysis on *how* the defendant's case is to be resolved, that is, on whether the prosecutor should be constrained by law to try the case on the given charge or have the discretion to resolve it by bargaining over the punishment that will follow a plea of guilty to that charge. We thus pose the normative question at the center of the controversy over plea bargaining in the most direct terms: should the prosecutor have the discretion to negotiate a specific punishment for a defendant without a trial? Since our answer does not depend on what form this discretion takes, whether it permits bargaining over the charge or directly over the sentence, we sacrifice no generality in focusing on the simple alternatives of plea bargaining and compulsory prosecution.

For simplicity, we assume that the defendant is risk-neutral and seeks to minimize his expected costs of punishment. The defendant's expected cost of going to trial is  $P_d s + t$ . Thus, he will accept a plea bargain if

$$(1) \quad b \leq P_d s + t.$$

This means that any plea bargain acceptable to the defendant reflects his prospects at trial as he perceives them and must leave him at least as well off (in expected terms) as going to trial.<sup>3</sup> We assume as well that, given the prosecutor's assessment of the probability of conviction at trial,  $P_p$ , her objective is to maximize the expected punishment imposed upon the defendant, net of the social cost of proceeding to trial should the defendant refuse a plea offer.<sup>4</sup> Easterbrook (1983) and Kobayashi (1992) each argue that this objective maximizes the deterrence of

crime,<sup>5</sup> and it is consistent with studies of actual prosecutorial motivation based on self-interest. For example, Grosman (1969, 63), quoting a Canadian prosecutor, notes, that “In the courtroom there is the acknowledged pressure that, once adversarial positions have been taken and a trial takes place, ‘You can’t afford to have many people found not guilty. Better not to prosecute them in the first place’”.<sup>6</sup> The adversarial system, moreover, casts the prosecutor as the chief accuser of the defendant, a role that naturally biases her not just toward securing a conviction but toward seeking the stiffest sentence possible, given resource constraints.<sup>7</sup>

Given this characterization of objectives, we write the prosecution’s expected return from a trial as  $P_p s - T$ , and the return from a plea bargain as  $b$ . Thus, the prosecutor prefers a plea bargain to a trial if

$$(2) \quad b \geq P_p s - T.$$

A plea bargain is feasible when there exists a value of  $b$  that satisfies both, (1) and (2). This will be the case if the parties substantially agree as to the predicted outcome of a trial (that is, if  $P_p = P_d$ ), since both will have an interest in avoiding the trial’s costs. The likelihood of a trial increases as  $P_p$  becomes larger than  $P_d$ , for in that case the parties each become more optimistic about their prospects at trial. Even where bargaining is feasible, trials might also result from breakdowns in bargaining due to strategic behavior or uncertainty.

The particular reason for the failure of the parties to reach a plea bargain in a given case has no effect on our qualitative results, so we do not formally incorporate it in the model, except to assume that, when a trial does occur,  $P_p \geq P_d$ . Instead, we simply let  $\beta_j$  denote the probability that a defendant will plead guilty in a given case, where  $j = I$  for a defendant who is in fact innocent and  $j = G$  for one who is truly guilty. This formulation raises the question of “selection bias” in plea bargaining; specifically, are guilty defendants more likely to plead guilty ( $\beta_G > \beta_I$ ), or are innocent defendants more likely to plead guilty ( $\beta_I > \beta_G$ )? As we shall see, this too is a question at the center of the debate over plea bargaining, but there is no empirical evidence on the issue, and existing theoretical models do not offer conclusive predictions. So we impose no a priori constraint on the relative magnitudes of  $\beta_I$  and  $\beta_G$ ; the particular relationship between these magnitudes does not affect our conclusions in a fundamental way.

Since we do not formally model the plea bargaining process itself, we cannot derive an explicit expression for  $b$ , the sentence imposed after a plea bargain. We require only that it satisfies (1) and (2). Most discussions of plea bargaining refer to the “sentence discount” or charge reduction that prosecutors must offer to induce guilty pleas, and a major criticism of plea bargaining focuses on this discount, because it is seen as penalizing defendants for exercising their constitutional right to trial.<sup>8</sup> In our model, the sentence discount is constrained by (1). Thus, as long as  $t$  is small relative to  $s$ ,  $b < s$ . Where appropriate in the analysis that follows, we

write  $b = \theta \cdot s$ , where  $\theta < 1$ . The smaller is  $\theta$ , the larger is the sentence discount, reflecting greater relative bargaining ability on the part of the defendant.

## 2. Social objectives, plea bargains and compulsory prosecution

In Section 1, we examined the outcomes of a plea bargaining process based on the interaction of a defendant and a self-interested prosecutor with unlimited discretion to decide the sentence the defendant will receive in exchange for waiving his right to trial. Now we consider the social desirability of a regime of compulsory prosecution, in which such bargaining is banned, and compare it to one in which unrestricted bargaining along the lines of our model is permitted. We ask what factors or circumstances might make plea bargaining socially desirable in general, and then consider the relationship of these factors to the United States Supreme Court's endorsement of plea bargaining in the face of arguments that bargaining may induce innocent defendants to plead guilty.

Limiting plea bargaining or banning it altogether may be desirable if its unrestricted use is not consistent with the broader social objectives of the criminal process. To evaluate this possibility, we must first specify a social objective function with respect to the prosecution of criminal defendants. It is of course not easy to say exactly what a nation wants and expects from its system of criminal justice, or to reduce the complex interplay of history, politics and ideology that shapes the qualitative evolution of a given system and the public's response to its outcomes to a vector of algebraic variables. But a series of cases decided by the Supreme Court in the 1970s, in which the constitutionality of plea bargaining in its most common forms was affirmed on the basis of the "mutuality of advantage" it confers on both sides, suggests the kinds of values that must be weighed by every system of criminal justice in a world of limited resources and imperfect adjudication.

In *Brady v. United States*, the Court candidly took for granted that the vast majority of American defendants who are offered plea bargains are in fact guilty, and observed that if routine trials can be avoided, "scarce judicial and prosecutorial resources are conserved for those cases in which there is a substantial issue of the defendant's guilt".<sup>9</sup> A year later, in *Santobello v. New York*, it called plea bargaining "an essential component of the administration of criminal justice. Properly administered, it is to be encouraged. If every criminal charge were subjected to a full-scale trial, the States and the Federal Government would need to multiply by many times the number of judges and court facilities".<sup>10</sup> At the same time, the Court made clear that it was also sensitive to aspects of the bargaining process that might threaten deeply rooted values of American criminal justice. If it could be shown that a particular bargaining tactic, or the bargaining process itself, substantially increased the likelihood that innocent defendants faced with incriminating evidence would convict themselves by pleading guilty to avoid the risk of an even greater sentence should they be convicted at trial, the constitutionality of bargained pleas would be cast into doubt. "But our view is to the contrary and is

based on our expectations that courts will satisfy themselves that ... there is nothing to question the accuracy and reliability of the defendants' admissions that they committed the crimes with which they are charged".<sup>11</sup>

The Court's discussion of the values at stake in any system's institutional approach to the problem of allocating scarce judicial resources suggests three essential arguments of the objective function of every system. One is the relative resource cost of trials and alternative forms of adjudication, a narrowly "economic" consideration that confronts every system in the same way, through caseload pressures that encourage the development of less costly modes of case disposition. The other two reflect the broader moral and political culture of which the criminal process is a part and carry different weights in different systems. The first are the social benefits of punishing truly guilty defendants, which include the retributive value of appropriately punishing the guilty, whatever rehabilitative effects punishment might have upon them, and the deterrent effects of punishment on prospective offenders. The second is the social disutility created by the perceived injustice of punishing defendants who are in fact innocent. These largely moral costs and benefits are generally not manifested in pecuniary terms. They are experienced subjectively by the citizenry at large and are thus far more difficult for legislatures and courts to estimate and accommodate in organizing the criminal process. But where these values change over time in a single culture, or tradition and ideology assign different weights to reliable punishment of the guilty and effective protection of the innocent in different cultures, we can expect the institutions of criminal justice to reflect these differences.

Our model already incorporates the first element in the summed costs of trial borne by the defendant and the prosecutor,  $t + T$ . We formalize the moral effects by supposing that a hypothetical social planner expects a defendant to suffer a cost  $x$  from the punishment he receives for his offense plus whatever trial costs he must bear. Assume that society derives a positive utility  $\delta x$  if the defendant is truly guilty, and negative utility  $-\lambda x$  if he is truly innocent.  $\delta$  and  $\lambda$  are thus scaling factors that translate costs incurred directly by defendants into utility or disutility experienced by citizens at large, an approach consistent with earlier attempts to incorporate the possibility of both correct and erroneous convictions in models of plea bargaining and weigh their respective effects on social welfare.<sup>12</sup> Recall that because our prosecutor cannot observe the actual guilt or innocence of any defendant and proceeds instead on the basis of her estimate of the probability of conviction given the evidence at hand, she seeks only to maximize the expected cost incurred by defendants without regard to their actual guilt or innocence. This means that where the conviction of defendants who are widely suspected or subsequently proven to be innocent inflicts cost on individuals not directly party to the proceedings themselves, the prosecutor's insensitivity to this cost creates a divergence of interest between her and society at large.

Of course, neither the prosecutor nor the social planner can know for certain whether a given defendant is or is not truly guilty. But suppose that the proportions of actually innocent and guilty defendants are known. Let  $\gamma$  be the proportion of



defendants who are in fact guilty, so that  $1 - \gamma$  is the proportion of innocent defendants; equivalently,  $\gamma$  is the probability that any given defendant is guilty, and  $1 - \gamma$  is the probability that he is not.<sup>13</sup> The expected social return when a defendant of unknown type suffers a cost  $x$  is thus  $[\gamma\delta - (1 - \gamma)\lambda]x$ . The term  $\gamma\delta - (1 - \gamma)\lambda$  is the weight assigned by society to the cost imposed on a defendant, compared to an implicit weight of one attached to the same punishment by the prosecutor, so the difference between  $\gamma\delta - (1 - \gamma)\lambda$  and one measures the divergence of interest between the prosecutor and society with respect to the defendant's costs. Another possible source of divergence exists when  $P_p s - T > 0$ , but  $\gamma\delta - (1 - \gamma)\lambda < 0$ , so that the prosecutor pursues a case against a defendant that, from a social perspective, ought to be dropped, and a third arises from the prosecutor's neglect of  $t$  as part of the total costs of a trial. This formulation allows us to specify how the divergence of interest between society and the prosecutor changes as the proportion of guilty defendants in the population varies, and how society alters its treatment of defendants (if at all) as the social cost of punishing the innocent varies in relation to the benefit of punishing the guilty.

With this specification of social objectives, we can write the expected social utility per defendant under a regime of unrestricted plea bargaining as follows:

$$(3) \quad EU_u^s = [\beta_G \gamma \delta - \beta_I (1 - \gamma) \lambda] b \\ + [(1 - \beta_G) \gamma \delta - (1 - \beta_I) (1 - \gamma) \lambda] (P_s + t) \\ - [\gamma (1 - \beta_G) + (1 - \gamma) (1 - \beta_I)] T,$$

where, recall,  $\beta_j$  is the probability of a plea bargain and  $1 - \beta_j$  is the probability of a trial,  $j = I, G$ . The first term represents the expected return from a plea bargain, the second the expected return from a trial, and the third the expected social cost of a trial. In the second term, we define  $P$  as an unbiased estimate of the probability of conviction, rather than either the prosecutor's assessment  $P_p$  or the defendant's assessment  $P_d$ . Consistent with the optimism model, we assume  $P_p \geq P \geq P_d$ . Compulsory prosecution means that  $\beta_I = \beta_G = 0$  in (3). This yields expected social utility of

$$(4) \quad EU_r^s = [\gamma \delta - (1 - \gamma) \lambda] (P_s + t) - T.$$

Note that (4) differs from (3) in two respects. First, the defendant's expected punishment is based entirely on the expected outcome of a trial, and second, the cost of a trial,  $T + t$ , is incurred with certainty in all cases. The difference between (4) and (3) represents the increase in expected social utility that would result from a ban on plea bargaining. Forming this difference and rearranging yields

$$(5) \quad \Delta \equiv EU_r^s - EU_u^s = [\beta_G \gamma \delta - \beta_I (1 - \gamma) \lambda] (P_s + t - b) \\ - [\gamma \beta_G + (1 - \gamma) \beta_I] T.$$

This difference may be positive or negative, so the choice between plea bargaining and compulsory prosecution depends on the specific values of the model's parameters. Increasing  $\Delta$  corresponds to increasing desirability of compulsory prosecution relative to plea bargaining.

In the remainder of this section, we examine these relationships in turn by differentiating  $\Delta$  with respect to  $\lambda$ ,  $\delta$ ,  $\gamma$  and  $T$ . To begin, observe that

$$(6) \quad \partial\Delta/\partial\lambda = -\beta_I(1-\gamma)(P_s + t - b) \leq 0, \quad \text{and}$$

$$(7) \quad \partial\Delta/\partial\delta = \beta_G\gamma(P_s + t - b) \geq 0.$$

These inequalities relate the desirability of compulsory prosecution (as measured by  $\Delta$ ) to the values society attaches to protecting the innocent and punishing the guilty, respectively. The signs follow from (1) and the fact that  $P \geq P_d$ , which together imply  $P_s + t - b \geq 0$ . Inequality (6) states that, relative to compulsory prosecution, unrestricted plea bargaining becomes more desirable as  $\lambda$ , the marginal social cost of punishing an innocent defendant, increases. To understand this result, note that as  $\lambda$  rises relative to  $\delta$ , the marginal social benefit of imposing punishment on all defendants is reduced, since the possibility remains that innocent defendants will be erroneously convicted and punished, resulting in the large social costs implied by higher values of  $\lambda$ . *Ceteris paribus*, the costliness of these errors makes plea bargains more attractive from a social point of view, because they result in the imposition of systematically smaller punishments on all defendants, innocent or guilty, relative to those imposed on defendants convicted at trial. In effect, high values of  $\lambda$  encourage the criminal process to spare the guilty by means of a sentence discount so that the costs that are unwittingly imposed on the innocent may be reduced. Similarly, inequality (7) shows that plea bargaining becomes less desirable as the social benefit of punishing guilty defendants increases. Increasing values of  $\delta$  relative to  $\lambda$  thus make compulsory prosecution more desirable and encourage the sacrifice of the innocent so that the guilty may be more reliably punished.<sup>14</sup>

But this striking conclusion, that plea bargaining becomes *more* desirable as the social cost of punishing the innocent increases, rests uneasily alongside the Supreme Court's concern in *Brady* that offering sentence concessions in exchange for guilty pleas creates the risk that innocent defendants will be induced by the sentence discount to convict themselves by guilty plea and thus subject themselves to unjust punishment. The source of this apparent inconsistency is the inevitable uncertainty that surrounds any fallible criminal process, the fact that trials produce not perfect reflections of the truth, but only acquittals and convictions based on the evidence at hand. In this sense, a factually innocent defendant and a guilty one against whom an equal measure of inculpatory evidence exists are indistinguishable in the eyes of the law. This means that the criminal process is institutionally committed to accepting the fairly rendered verdict in any given case as a necessarily imperfect proxy for the actual truth of the matter. As we have seen, the defendant's decision

to plead guilty or insist upon a trial turns not so much on his actual guilt or innocence as on his assessment of the strength of the evidence against him and the likelihood it creates that he will be convicted. If this evidence is strong, a jury may convict him despite his continuing claim of innocence, and a judge may accept his guilty plea despite his accompanying denial of guilt.<sup>15</sup> In these circumstances, the fact that the decision by an innocent defendant against whom substantial evidence of guilt exists to refuse a plea bargain leaves him at risk of receiving a greater punishment upon conviction on this same evidence at trial renders the Court's concern that innocent defendants not be induced to plead guilty somewhat beside the point. A rational defendant, innocent or guilty, will estimate the likelihood of conviction at trial as best he can on the basis of the available evidence against him, and will not accept a plea bargain unless it promises smaller disutility than he expects to suffer at trial. Given the unavoidable uncertainty associated with determining guilt or innocence, and contrary to the intuition of the Court, our analysis suggests that permitting plea bargains may be the best way to minimize the expected social cost of punishing the innocent.<sup>16</sup>

This conclusion rests on the assumption that reducing the aggregate expected punishment suffered by innocent defendants always increases social welfare, irrespective of the number of innocent defendants who are convicted (by trial or by plea). Society, in other words, suffers no disutility from the fact of an erroneous conviction itself, apart from the punishment that is imposed as a result. This is due to our specification of the social cost of punishing an innocent defendant as  $\lambda x$  rather than, say  $z + \lambda x$ , where  $z$  is the social cost specifically attributable to the existence of a false conviction, independent of punishment. Adopting the latter specification would add an extra term,  $(1 - \gamma)\beta_1(1 - P)z$ , to  $\Delta$  in Eq. (5). As a result, the desirability of mandatory trials would increase, *ceteris paribus*, since a trial always holds out the possibility of an acquittal that is now socially valuable in itself, while plea bargains always result in convictions.

This threshold treatment of the cost of conviction illustrates the larger point, relevant to inequality (7) as well, that society generally attaches positive value to reaching the factually correct outcome in a criminal prosecution, independent of its consequences for punishment. That is an erroneous conviction that carries no punishment is still costly and, as Grosman's (1969) prosecutor suggests, a conviction of a truly guilty defendant has value even if no punishment follows it.<sup>17</sup> It is this concern for reaching the correct result that animates the argument that full adversarial trials are a surer route to accurate outcomes in criminal cases than negotiated pleas, in that a trial, as Schulhofer (1988, 79) puts it, "provides important avenues for enhancing the information generated by the highly imperfect pretrial process" on which plea bargains are necessarily based. Indeed, the presumption that trials are more likely than plea bargains to produce outcomes that reflect actual guilt or innocence is often central to the arguments of advocates of compulsory prosecution for the United States. And it is shared by the Court, which conditioned its approval of plea bargaining on the assumption that the vast majority of those who plead guilty are in fact guilty, freeing resources for trials in

“those cases in which there is a substantial issue of the defendant’s guilt or in which there is substantial doubt that the State can sustain its burden of proof”.<sup>18</sup>

Recall our definition of the parameter  $\gamma$  as the proportion of defendants facing prosecution who are actually guilty. Increases in  $\gamma$  can usefully be interpreted as improvements in the quality of detection, which might be realized by increased expenditure on police or by technological advances such as identification by DNA. Consider the impact of a change in the proportion of guilty defendants on the desirability of plea bargaining:

$$(8) \quad \partial\Delta/\partial\gamma = (\beta_G \delta + \beta_I \lambda)(Ps + t - b) - (\beta_G - \beta_I)T > < 0.<sup>19</sup>$$

Ignoring the second term for a moment, this expression is positive, suggesting that an increase in the probability that a given defendant is actually guilty makes plea bargaining less socially desirable because, *ceteris paribus*, the greater likelihood of the defendant’s guilt increases the net social benefit of imposing a harsher punishment on him at trial. Put differently, this means that, despite the Court’s presumption that trials are more likely to avoid the costs of erroneous outcomes, plea bargains become *more* desirable as the defendant’s guilt becomes less certain. Deterrence is served as well, since the stronger evidence produced by improved detection increases the expected punishments defendants face.

In the American context, there is reason to doubt the superiority of adversary trials as a mean to the truth. As the recent rash of death sentences overturned in light of new DNA evidence makes clear, human fallibility ensures that even the most scrupulous trial procedure will sometimes result in a verdict at odds with the truth. But in the United States (and generally not in European jurisdictions) the ability of trials to get at the truth is compromised still further by rules of evidence and constitutional safeguards, such as the exclusionary rule and a broadly construed right not to incriminate oneself, whose explicit purpose is not to assist the search for truth but to fortify defendants against the advantages of resources and expertise typically enjoyed by prosecutors. Whatever other values they might serve, these “rights against the truth”, coupled with the requirement that guilt be proved to a unanimous jury not merely by a preponderance of the evidence but beyond a reasonable doubt, tilt the scales at trial toward the defendant at the expense of factual accuracy in the verdict, an advantage that carries over to the plea bargaining process.<sup>20</sup> The Court’s forthright if understandably reluctant conclusion in *Brady* is the right one: defendants should have the freedom to strike the best deal they can in the face of a trial process whose ability to provide an accurate answer to the question of guilt is uncertain. As Easterbrook (1983, 316, 320) observes, the value of trials “cannot be derived from the supposed clarity of information about guilt or innocence trial conveys. There are too many variables at work, from the stacked burden of proof to the vagaries of testimonial evidence, for trials to convey the ‘truth’ with regularity”. So there is “no reason to prevent [an innocent] defendant from striking a deal that seems advantageous. If there is injustice here,

the source is not the plea bargain. It is, rather, that innocent people may be found guilty at trial”.

The second term in (8) reflects the cost of trials and increases the desirability of compulsory prosecution if  $\beta_G \leq \beta_I$ . In this case, innocent defendants are more likely to plead guilty than are guilty defendants, so that an increase in the proportion of guilty defendants in the population reduces the savings in trial costs that result from permitting plea bargaining. If  $\beta_G > \beta_I$  (the outcome in screening models), guilty defendants are more likely to plead guilty, so that an increase in  $\gamma$  increases the savings realized by plea bargaining. If this effect is sufficiently strong, it can dominate the first term in (8) and make trials less desirable as  $\gamma$  increases. Finally, consider the impact of a change in trial costs:

$$(9) \quad \partial\Delta/\partial T = -[\beta_G\gamma + \beta_I(1 - \gamma)] < 0.$$

This demonstrates the intuitive result that as  $T$  increases, plea bargaining becomes more attractive to society because of the savings in trial costs it entails.<sup>21</sup>

### 3. Values and procedures

We have thus far been concerned with the social costs and benefits of plea bargaining in the American criminal process, an adversarial system whose development has been conditioned by a particular constellation of values and circumstances. Here, with the hope of clarifying the issues in the continuing debate over the existence and desirability of European analogs to plea bargaining, we draw upon the comparative statics of Section 2 to add a comparative dimension to the analysis.

The European rule of compulsory prosecution effectively prohibits explicit bargaining in the American style. Insofar as judges retain the sole power to sentence, prosecutors must proceed to trial on the most serious charge for which the evidence discloses a factual basis, and defendants cannot abort the trial by confessing or pleading guilty, there is nothing to negotiate. But even the streamlined continental trial consumes time and money, and if these are insufficient to process the existing caseload under compulsory prosecution, the rule will have to be modified in some way to accommodate this reality. From a narrowly pecuniary point of view, the taxonomy of these responses is irrelevant. It scarcely matters whether a given adaptation does or does not resemble American plea bargaining; the salient question is whether or not it enables the caseload to be processed and the system to avoid collapse. But systems of criminal justice themselves embody moral and political values that are more compatible with some kinds of procedural adaptations than with others, and the institutions that generate the adaptations must respond to them as well as to budgetary pressures (Adelstein 1981b). In Section 2 we showed that plea bargaining is an adaptation that “fits well” in a system whose fundamental commitment is not to truth as such but to fairness of

the process and whose elaborate trial procedures manifest a strong aversion to false convictions. But to Europeans, whose inquisitorial systems seek strict enforcement of the law and treat the state and the defendant not as adversaries but as the court's collaborators in the search for truth, the bald, unseemly give-and-take that dispenses justice in America smacks of "cow trading" (Langbein 1979, 212–213) that only rarely produces legal outcomes congruent with the facts. From this broader perspective, whether adaptive procedures in Europe are or are not like American plea bargains is an important matter indeed, for it directly implicates the contrasting values and purposes that characterize the adversarial and inquisitorial systems.

Our analysis of inequalities (6) and (7) suggested that as the marginal social benefit of punishing the guilty rises in relation to the marginal cost of punishing the innocent, compulsory prosecution becomes more desirable relative to plea bargaining. The organization of the criminal trial in the two systems seems to bear this out. To American eyes, continental trials are cursory affairs, often lasting but an hour or two. They are dominated by a trained investigative judge who, on the basis of a dossier prepared by the police or prosecutor, fixes the charge, directs the taking of evidence, examines witnesses and, often with the assistance of other judges and lay persons, renders a verdict and fixes punishment. Defendants have few rights to exclude reliable evidence or otherwise shield themselves from the consequences of the truth, and though they generally enjoy a right against self-incrimination, they must nonetheless submit to interrogation by the judge.<sup>22</sup> The premium in such systems is on efficient finding of the facts and conforming the verdict as closely as possible to them, and one might think this to be the best protection innocent defendants could have from false convictions. But the speed of continental trials and their lack of effective cross-examination means that the largely unchallenged dossier is the principal source of facts. This is surely to the detriment of guilty defendants; without the opportunity to challenge or exclude incriminating evidence, they are unlikely to be able to cast substantial doubt the dossier's version of the truth, and a greater proportion of them will probably be convicted than would otherwise be the case. But it is equally to the detriment of innocent defendants, for much the same reasons. Defendants would not be on trial at all if there were no incriminating evidence in the dossier; what innocent defendants most need to overcome the dossier's weight and win acquittal are precisely the means to aggressively challenge the dossier that are denied by continental procedure. In this sense, while it would clearly be wrong to say that European procedure is blind or insensitive to the costs of erroneous convictions, it does seem fair to conclude that, at the margin, it encourages the sacrifice of the rare innocent defendant so that the guilty may be punished.

The American trial, in contrast, is not an inquiry conducted by experts committed to reaching the result that conforms most closely to the facts, but a combat between prosecution and defense over whether the defendant is to be held liable. It is played out under strict rules before a lay jury free to convict the defendant of

a lesser offense inconsistent with the facts, or even to acquit in the face of strong evidence of guilt, as it believes justice demands. Each side tries to present the evidence in the best possible light for itself, with only the prosecution under an ethical obligation to believe the account it presents, and the judge assumes the passive role of referee. In an effort to level the playing field against prosecutors presumed to enjoy substantial advantages in the combat and not fully trusted to wield the powers of their office fairly, defendants are given a broadly defined right not to testify and a right to exclude inculpatory but illegally gathered evidence, irrespective of its probity. The effect of these procedural weapons is to make it easier than it would otherwise be to raise a “reasonable doubt” as to the defendant’s guilt, and if this means that defendants who appear on the basis of the facts presented by the prosecution to be clearly guilty will sometimes be acquitted, this has generally been seen by the courts as a price worth paying for the protection it affords innocent defendants. And so, while it would certainly be wrong to say that American procedure seeks out or encourages false acquittals, it is fair to say that, at the margin, it tolerates the occasional acquittal of the guilty so that the innocent may be protected.

Superimposing the principle of efficiency on the two systems in this way suggests that plea bargaining is more likely to evolve in systems that emphasize the protection of innocent defendants, and systems that stress punishing the guilty are more likely to be able to sustain a regime of compulsory prosecution. But European systems are, to one degree or another, subject to the same caseload pressures that face American jurisdictions, and if the adaptations they have produced do not resemble plea bargains in form, they are clearly similar in function. In France, for example, serious felonies (*crimes*), for which formal trials in the Courts of Assize are required, are distinguished from lesser offenses (*délits*), triable under more relaxed rules in a Correctional Court. This has given rise to an analog to charge reduction called “correctionalization”, in which the prosecutor transfers a case of *crime* to the Correctional Court by treating it as a “lesser included” *délit*. The great majority of cases are disposed as *délits*, a result that Goldstein and Marcus (1977, 276–277) attribute to the regular use of this tactic by prosecutors “to avoid a judicial examination and a prolonged trial. In doing so, [they are], in effect, offering an accused a lesser sentence for a *délit* in exchange for a waiver by the accused of the full process that he would have if he were charged with a *crime*”.

Similarly in Germany, where offenses classified as minor but which currently include such American felonies as forgery, embezzlement, fraud and receiving stolen goods may, at the prosecutor’s behest, be adjudicated by a penal order (*Strafbefehl*), in which the defendant waives his right to a trial and accepts the penalty specified in the order (Langbein 1979, 213–218). Despite the vesting of control over the procedure in a prosecutor ostensibly committed to compulsory prosecution, there is evidence that bargaining over the issuance of penal orders, sometimes initiated by defense counsel, does occur, particularly in cases of white

collar crime (Haglich 1991, 104). In both France and Germany, even cases decided in a full trial are resolved more quickly when defendants confess or choose not to contest the charges, and one study of German procedures found that unrecanted confessions were made in 41% of the cases tried (Casper and Zeisel 1972, 146–147). In such cases, “the trial is no more painstaking a proceeding than the taking of a guilty plea” in the United States (Goldstein and Marcus 1977, 268).

So continental systems do have procedures that serve the same function that plea bargaining does, but their use is limited to relatively minor crimes, while more serious offenses remain subject to compulsory trials. Our model offers a useful perspective on this as well. Consider, the punishment imposed upon conviction at trial, as a proxy for the severity of the offense. Differentiating (5) with respect to  $s$  yields

$$(10) \quad \partial\Delta/\partial s = [\beta_G\gamma\delta - \beta_I(1 - \gamma)\lambda](P - \theta),$$

where the term  $(P - \theta)$  is obtained by setting  $b = \theta s$  as described above.<sup>23</sup> This expression is positive as long as the sentence discount does not decrease with the severity of the crime; the term in square brackets is also positive if we assume that, on average, there is positive value in punishing defendants. A positive sign for (10) means that compulsory prosecution becomes socially more desirable as the severity of the offense increases, a position reflected in both the taxonomy debate and in the law’s restriction of alternative procedures like the penal order to relatively minor offenses. Even Langbein, plea bargaining’s severest American critic, refers to the penal order as a “German guilty plea” and acknowledges that, in the cases for which it is intended, its purpose is to divert “uncomplicated cases of overwhelming evidence [like] the shoplifter caught-in-the-act or the drunk driver whose blood sample incriminates him” from the more costly trial procedure. And he concedes that, if the resource costs of compulsory prosecution were to be magnified by levels of serious crime comparable to those in America, the Germans “would almost certainly need to divert more of their caseload into . . . nontrial channels [and] redraw their trial/nontrial line at some higher point on the scale of gravity of offenses” (1979, 209–223). But defendants are free to refuse the offer of a penal order with a specified penalty, and German law protects those who insist on a trial from a harsher punishment than that specified in the penal order unless significant new evidence is brought to light, which is very rare.

On its face, the penal order is clearly not a plea bargain, for without the sentence discount made possible by the threat of a harsher sentence at trial, there is little incentive for a defendant to surrender the possibility of acquittal at trial and accept a penal order. Yet some 70% of the defendants offered penal orders accept them (Haglich 1991, 102). Langbein explains this striking statistic by asserting that a German defendant “who waives trial and accepts a penal order for shoplifting or drunk driving does so for the same reasons that an American waives his right to trial on a charge of running a stop sign—not in exchange for a lesser



sanction, but to save the time, nuisance, occasional notoreity, and occasional defense costs involved in waging [a] hopeless contest” (1979, 218). Perhaps, though one may doubt that embezzlers and receivers of stolen property often enter the criminal process with the same inclination to cooperate in their own prosecution as Americans accused of minor traffic offenses. But even if there were a small sentence discount associated with the penal order, inequality (10) suggests that restricting it to cases of minor crimes might nonetheless make it an acceptable adaptation in continental systems.

More plausibly, Langbein insists that the rule of compulsory prosecution *is* strictly observed in Germany for major crimes (that is, for large *s*), and that no sentence discount is offered in exchange for confessions at trial (Langbein 1979, 224). Similarly in Italy, whose new code attempts to graft plea bargaining onto an otherwise inquisitorial system but limits it to crimes for which the maximum penalty is two years in prison (Boari 1997, 119). For more serious crimes, a powerful moral argument lies behind the European contempt for bargained justice. The sentence discounts that make plea bargaining work obviously distort the rough proportioning of punishments to the social costs of crimes that every statutory matrix of graded offenses is intended to produce (Adelstein 1999). By driving the price of crime so far below its cost, plea bargaining not only deprives the law of much of its deterrent effect, it nullifies the central moral function of every criminal process, the infliction of just punishment on those convicted of serious crimes.

The aesthetics of bargaining aside, it is this cheapening of crime and the interests of victims that lend moral weight to the controversy over plea bargaining. The argument that plea bargaining inappositely lowers the price of crime manifests the concern that criminals receive their due, a demand continental systems address through trials dominated by state officials whose efficiency stems largely from the absence of procedural safeguards that protect defendants from misconduct by those officials. Perhaps, as Langbein (1979) suggests, this suits a citizenry confident that judges and prosecutors will not abuse their powers so as to knowingly convict and punish defendants whose guilt may reasonably be doubted. In this sense, inquisitorial systems rely on the neutrality and professionalism of judicial officials to ensure that the primary objective of punishing the guilty can be pursued through relatively simple trial procedures that might, in an adversarial system, create a much greater risk that innocent defendants would be convicted.

Americans who resist the call for compulsory prosecution and simpler trials, on the other hand, seem not nearly so trusting of the state. Like Goldstein and Marcus, they find it hard to believe that prosecutors will not cut corners or bend the law where they can in order to clear the docket with the convictions it is in their interest to produce. In their view, the costs of false convictions outweigh the benefits of punishing the guilty to the fullest extent of the law and so, unlike Langbein (1992), they would tolerate the inevitable distortions of plea bargaining before they would simplify American trial procedure or dismantle the elaborate structure of defendants’ rights that makes conviction at trial so difficult. From this

perspective, it is this fragile constitutional scaffolding, not the integrity of judges or the professional culture of prosecutors, that keeps the ever-present potential for official abuse at bay.

Outside the academy, however, there are signs that both Europeans and Americans are seeking a middle ground between these two positions. After a quarter century of debate, Italy in 1989 adopted a new code of criminal procedure that responds to caseload pressures and an increasing suspicion of public officials by introducing significant elements of adversarial practice to a traditional inquisitorial system, including the open, explicit negotiation of sentencing concessions for guilty pleas.<sup>24</sup> And in the United States, a series of highly publicized and emotionally charged criminal trials over the past decade has revealed a degree of popular impatience with the outcomes of adversarial trials dominated by the rights of defendants and led some to propose revisions of these rights and changes in rules and procedures that would reduce the obstacles to conviction at trial. As Jörg, Field and Brants (1995) suggest, the two systems may well be converging in a common preference for streamlined trials and, where appropriate, effective procedures to avoid them.

#### **4. Conclusion**

Our model has connected the social desirability of procedures used to resolve criminal cases to a set of variables intended to represent some of the values that underlie two contemporary systems of criminal justice. We have added to it an empirical claim that the nature of the trial procedures in inquisitorial and adversarial systems reflect a primary emphasis on justly punishing the guilty in the former and avoiding the conviction of innocent defendants in the latter, and concluded that plea bargaining is thus likely to increase social welfare in an adversarial but not in an inquisitorial system. There is clearly more to be done, both theoretically and empirically. The empirical relationship between trial procedures in the two systems and the particular values we have suggested, for example, deserves closer study, both to determine its accuracy and to investigate the origins of such preferences, how they are made manifest in a given system and how they operate to constrain the day-to-day decisions of judicial officials. The simple model of plea bargaining in Section 1 might be made more responsive to alternative or more complex depictions of the motivations and behavior of the parties. The social objective function of Section 2 might be expanded to include the goal of deterrence more explicitly, and different underlying values and procedures characteristic of other cultures and systems of criminal justice might be included to shed new light on the relationship between values and procedures in those systems. If our analysis has raised as many questions as it has answered, this has been one of its purposes. It is meant as a first word on the subject, not the last.

## Notes

1. The debate is summarized in Adelstein (1998).
2. We assume, that is, “sentence bargaining” rather than the “charge bargaining” that is the norm in American jurisdictions, where sentences are fixed by the Court but prosecutors have the power to select and thus to bargain over the charge and, in this indirect way, the punishment. Under Italy’s recently instituted Code of Criminal Procedure, negotiated pleas are encouraged but charge bargaining is forbidden; negotiations are conducted directly over the punishment (Boari 1997, 119).
3. Incorporating risk preference poses no conceptual difficulty. A risk-averse defendant would accept a certain punishment somewhat greater than the expected sentence at trial to avoid the uncertainty of the trial; a risk-preferrer would go to trial even if the certain punishment were somewhat less than the expected trial sentence.
4. Note that the prosecutor cannot observe the actual guilt or innocence of any defendant; all she can do is to assess the available evidence in the case at hand, estimate the likelihood of a conviction on the basis of it, and act accordingly. *Ceteris paribus*, she will proceed identically in two cases for which the estimates  $P_p$  are equal, even if, unknown to her, one defendant is in fact innocent and the other guilty.
5. Easterbrook (1983, 309) argues that “plea bargaining is desirable, not just defensible, if the system attempts to maximize deterrence from a given commitment of resources. It serves the price establishing function at low cost”. But deterrence is not served if plea bargaining tends to lower the expected punishment of the truly guilty. See note 18, below.
6. Compare Schulhofer’s (1988, 50–53) discussion of prosecutorial objectives.
7. At the same time, the prosecutor has an ethical responsibility not to conceal exculpatory evidence, or to prosecute at all where she believes the defendant to be innocent.
8. See, for example, *Scott v. United States*, 419 F.2d 264 (D.C. Cir. 1969), and Langbein (1979). In contrast, Easterbrook (1983) argues that plea bargaining promotes efficiency by creating opportunities for mutually beneficial exchange in the criminal process.
9. *Brady v. United States*, 397 U.S. 742, 752 (1970).
10. *Santobello v. New York*, 404 U.S. 257, 260 (1971).
11. *Brady v. United States*, 397 U.S. 742, 758 (1970). Two subsequent cases demonstrated the Court’s commitment to plea bargaining in its refusal to overturn guilty pleas made by defendants in highly problematic circumstances. In *North Carolina v. Alford*, 400 U.S. 25 (1970), it held that, where substantial evidence of the defendant’s guilt exists, a court may accept a guilty plea made in exchange for leniency even if the defendant simultaneously denies committing the offense to which he is pleading guilty; and in *Bordenkircher v. Hayes*, 434 U.S. 357 (1978), it sustained as voluntary a plea of guilty to passing a forged check for \$88.30 made in response to a prosecutor’s threat to invoke an habitual offender statute that carried a mandatory life sentence if the defendant refused a plea offer. Though plea bargaining has remained the subject of considerable academic criticism in the United States since 1978, and a small number of individual jurisdictions (the state of Alaska among them) have attempted to limit or ban plea bargaining by legislation or administrative fiat, the courts have consistently endorsed the plea bargaining system and sustained it against legal challenge.
12. See, for example, Harris (1970), Reinganum (1988) and Miceli (1990). One might object to the specification of these costs as simple linear functions of the severity of punishment, particularly in the case of cultures that experience substantial disutility from the erroneous punishment of the innocent. Below, we address this possibility by adding a fixed cost specifically attributable to the fact of the false conviction itself.
13. It is of course no more plausible to assume that these proportions are known than that the actual guilt or innocence of any individual is known. The parameter  $\gamma$  should therefore be interpreted as an index of the accuracy of the detection technology; that is, an increase in  $\gamma$  corresponds to an

increase in the ability of the police to identify and apprehend the true offender. See the discussion of inequality (8) below.

14. We return to this point in Section 3. Both conclusions rely on the exogeneity, from the prosecutor's point of view, of the statutory punishment  $s$ . Perhaps legislatures would respond to the efforts of prosecutors to lower sentences by plea bargaining by simply raising the statutory sentences. This would not affect our conclusions so long as the prosecutor treats the statutory penalty as given in the course of negotiating with individual defendants and does not act strategically in anticipation of legislative efforts to adjust it, a reasonable supposition.
15. *North Carolina v. Alford*, 400 U.S. 25 (1970).
16. This conclusion is in contrast to Grossman and Katz (1983), who derive highly artificial separating equilibria in which all guilty defendants plead guilty and all innocent defendants go to trial. This outcome requires that plea bargaining serve as a perfect screen, that is, that *all* innocent defendants have a lower probability of conviction at trial than *all* guilty defendants, a condition that is almost certainly not met in practice. Moreover, such a separating equilibrium implies that courts should summarily acquit every defendant at trial, insofar as they are all innocent. But if they did this, guilty defendants would have no incentive to plead guilty, and the equilibrium would break down.
17. See text at note 6, above.
18. *Brady v. United States*, 397 U.S. 742, 752 (1970). A further argument against plea bargaining is its likely impact on deterrence. If plea bargaining allows the guilty as well as the innocent to avoid harsher punishment, the deterrent effect of criminal sanctions will clearly be reduced (Miceli 1996). A countervailing effect is that plea bargaining may enhance deterrence by freeing prosecutorial resources for other cases, making it more likely that other offenders will face some punishment. Whatever the relative magnitudes of these effects, a more general model of criminal procedure would certainly include optimal deterrence (however that might be defined) as an objective along with the minimization of error and trial costs in assessing the desirability of plea bargaining.
19. This expression ignores the fact that as  $\gamma$  increases,  $P$  and  $b$  are likely to rise as well. The effects of these secondary changes on (8) are ambiguous, and we ignore them here.
20. Adelstein (1998). See also Pizzi (1999), criticized by Bracey (2000).
21. This conclusion ignores possible secondary effects of a change in  $T$ . First, an increase in  $T$  lowers the prosecutor's expected value of a trial (see (2)), which lowers  $b$ , assuming that the defendant has some bargaining power, and increases the sentence discount given for a guilty plea. So if punishment of defendants is socially desirable, that is, if  $\gamma\delta - (1 - \gamma)\lambda > 0$ , this makes plea bargaining less attractive. Second, changes in  $T$  may alter the settlement rates for both factually innocent and guilty defendants. Higher  $T$  should increase the rate of plea bargaining, though it may affect this rate differently for the two classes of defendants, thereby changing the nature of the selection bias. The overall impact of this effect is probably ambiguous. Finally, trials are cheaper in the inquisitorial system, which is inconsistent with our treatment of  $T$  as a parameter. But this is not a necessary consequence of a ban on plea bargains; a few American jurisdictions have attempted to limit or abolish plea bargaining without changing the existing character of adversarial trials.
22. On inquisitorial systems, see Damaska (1973), Langbein (1977) and Pizzi (1999, 89–116).
23. Expression (10) again ignores second-order effects of changes in  $s$  on the  $\beta$ 's. For example, one might say that the higher the stakes of the case (as measured by  $s$ ), the less likely it is that a plea bargain will be struck. But it is not clear whether this effect would differ for innocent and guilty defendants, so its impact on (10) is ambiguous.
24. Miller (1990). In an empirical study of the new code's impact, Boari (1997) found that the introduction of plea bargaining did little to improve the efficiency of Italian criminal justice. One may speculate as to the reasons for this: the use of bargaining in fewer than 8% of Italian cases compared to more than 90% of American cases, perhaps, or a mitigation of the deterrent effect of punishments as a result of plea bargaining that led to an increased number of cases to process. We leave these issues to another day.

## References

- Adelstein, Richard (1978). "The Plea Bargain in Theory: A Behavioral Model of the Negotiated Guilty Plea." *Southern Economic Journal* 44, 488–503.
- Adelstein, Richard (1981a). "Institutional Function and Evolution in the Criminal Process." *Northwestern University Law Review* 76, 1–99.
- Adelstein, Richard (1981b). "The Plea Bargain in England and America: A Comparative Institutional View." In P. Burrows & C. Veljanovski (eds.), *The Economic Approach to Law*, London: Butterworths, 226–252.
- Adelstein, Richard (1998). "Plea Bargaining—A Comparative Approach." In P. Newman (ed.), *The New Palgrave Dictionary of Economics and the Law*, London: Macmillan, 3, 46–50.
- Adelstein, Richard (1999). "Victims as Cost Bearers." *Buffalo Criminal Law Review* 3, 131–173.
- Boari, Nicola (1997). "On the Efficiency of Penal Systems: Several Lessons from the Italian Experience." *International Review of Law and Economics* 17, 115–126.
- Bordenkircher v. Hayes, 434 U.S. 357 (1978).
- Bracey, Christopher (2000). "Truth and Legitimacy in the American Criminal Process." *Journal of Criminal Law and Criminology* 90, 691–728.
- Brady v. United States, 397 U.S. 742 (1970).
- Casper, Gerhard & Zeisel, Hans (1972). "Lay Judges in the German Criminal Courts." *Journal of Legal Studies* 1, 135–191.
- Damaska, Mirjan (1973). "Evidentiary Barriers to Conviction and Two Models of Criminal Procedure: A Comparative Study." *University of Pennsylvania Law Review* 121, 506–589.
- Easterbrook, Frank (1983). "Criminal Procedure as a Market System." *Journal of Legal Studies* 12, 289–332.
- Goldstein, Abraham & Marcus, Michael (1977). "The Myth of Judicial Supervision in Three 'Inquisitorial' Systems: France, Italy, and Germany." *Yale Law Journal* 87, 240–283.
- Goldstein, Abraham & Marcus, Michael (1978). "Comment on Continental Criminal Procedure." *Yale Law Journal* 87, 1570–1577.
- Grosman, Brian (1969). *The Prosecutor: An Inquiry into the Exercise of Discretion*, University of Toronto Press, Toronto.
- Grossman, Gene & Katz, Michael (1983). "Plea Bargaining and Social Welfare." *American Economic Review* 73, 749–757.
- Haglich, Helen (1991). "A Comparison of Guilty Plea Procedure in the United States and Germany." *Dickinson Journal of International Law* 10, 93–112.
- Harris, John (1970). "On the Economics of Law and Order." *Journal of Political Economy* 78, 165–174.
- Jörg, Nico, Field, Stewart & Brants, Chrisje (1995). "Are Inquisitorial and Adversarial Systems Converging?" In P. Fennell, C. Harding, N. Jörg & B. Swart (eds.), *Criminal Justice in Europe: A Comparative Study*, Oxford: Clarendon Press, 41–56.
- Kobayashi, Bruce (1992). "Deterrence with Multiple Defendants: An Explanation of 'Unfair' Plea Bargains." *Rand Journal of Economics* 23, 507–517.
- Landes, William (1971). "An Economic Analysis of the Courts." *Journal of Law and Economics* 14, 61–107.
- Langbein, John (1977). *Comparative Criminal Procedure: Germany*, West Publishing, St. Paul.
- Langbein, John (1979). "Land Without Plea Bargaining: How the Germans Do It." *Michigan Law Review* 78, 204–225.
- Langbein, John (1992). "On the Myth of Written Constitutions: The Disappearance of the Criminal Jury Trial." *Harvard Journal of Law and Public Policy* 15, 119–127.
- Langbein, John & Weinreb, Lloyd (1978). "Continental Criminal Procedure: 'Myth' and Reality." *Yale Law Journal* 87, 1549–1569.
- Miceli, Thomas (1990). "Optimal Prosecution of Defendants Whose Guilt is Uncertain." *Journal of Law, Economics and Organization* 6, 189–201.

- Miceli, Thomas (1996). "Plea Bargaining and Deterrence: An Institutional Approach." *European Journal of Law and Economics* 3, 249–264.
- Miller, Jeffrey (1990). "Plea Bargaining and Its Analogues Under the New Italian Criminal Procedure and in the United States, Towards a New Understanding of Comparative Criminal Procedure." *New York University Journal of International Law and Politics* 22, 215–251.
- North Carolina v. Alford, 400 U.S. 25 (1970).
- Pizzi, William (1999). *Trials Without Truth*, New York: New York University Press.
- Reinganum, Jennifer (1988). "Plea Bargaining and Prosecutorial Discretion." *American Economic Review* 78, 713–728.
- Reinganum, Jennifer (1993). "The Law Enforcement Process and Criminal Choice." *International Review of Law and Economics* 13, 115–134.
- Santobello v. New York, 404 U.S. 257 (1971).
- Schulhofer, Stephen (1988). "Criminal Justice Discretion as a Regulatory System." *Journal of Legal Studies* 17, 43–82.
- Scott v. United States, 419 F.2d 264 (D.C. Cir. 1969).