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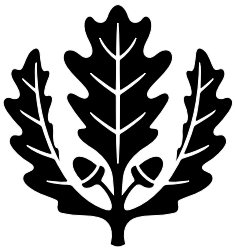

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Sentencing Guidelines, Judicial Discretion, And Social Values

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Abstract

This paper studies the institutional structure of criminal sentencing, focusing on the interaction between legislatures, which set sentencing ranges ex ante, and judges, who choose actual sentences from within those ranges ex post. The key question concerns the optimal degree of judicial discretion, given the sequential nature of the process and the possibly divergent interests of legislatures and judges regarding the social function of criminal punishment. The enactment of sentencing reform in the 1970s and 80s provides both a context for the model and an opportunity to evaluate its conclusions.

Journal of Economic Literature Classification: K14, K42

Keywords: Criminal punishment, Judicial discretion, Sentencing reform

Sentencing Guidelines, Judicial Discretion, and Social Values

1. Introduction

Judicial discretion in criminal sentencing has long been an important (and controversial) feature of the criminal process. There are, however, opposing views regarding its function. Some claim that it enhances deterrence by allowing judges to vary sentences according to a defendant's "deterability" (Easterbrook, 1983), but others argue that it promotes fairness or justice by allowing judges to tailor sentences to the particular circumstances of the crime (Freed, 1992). Whether or not one advocates greater judicial discretion therefore depends on which theory one ascribes to, as well as one's view of the social function of criminal punishment.

The standard economic theory of crime has focused primarily on the goal of deterrence while devoting relatively little attention to the institutional structure of sentencing.[1] Typically, the sentencing authority is viewed as a single entity that chooses both the probability of apprehension and the severity and type of punishment. This monolithic approach, however, while yielding considerable insights, abstracts from the multi-tiered nature of actual punishment, which involves multiple agents and institutions with possibly divergent objectives. In this paper, we focus on part of this rich structure—namely, the interaction between legislatures and judges.[2] Specifically, we model the legislature as establishing a sentencing range ex ante (i.e., before crimes have been committed), and judges as choosing actual sentences from that range ex post (i.e., when

[1] The modern version of this theory began with Becker (1968) and is surveyed in Polinsky and Shavell (2000a). Some papers have examined alternative goals such as fairness. See, for example, Miceli (1991) and Polinsky and Shavell (2000b).

faced with an actual defendant). The key question concerns the optimal interaction between the stringency of legislative guidelines and the degree of judicial discretion within this sequential process, given that legislatures and judges may hold differing views regarding the social function of punishment. The enactment of determinate sentencing by many states and the federal government in the late 1970s and early 1980s, which greatly curtailed judicial discretion, provides both a context for the model and an opportunity to evaluate it conclusions.

The paper is organized as follows. Section 2 sets up and analyzes the model. Section 3 then discusses the results in the context of sentencing reform. Finally, Section 4 concludes.

2. The Model

The structure of the model is as follows. First, potential offenders decide whether or not to commit a criminal act by comparing the gain to the expected punishment. Once an act is committed, the offender is caught with probability p and subject to a fine s.[3] We focus here on how the fine is determined, while treating the probability of apprehension as fixed.[4] Consistent with actual sentencing practices (as discussed in the introduction), we assume that a sentencing authority or legislative body first determines a range of punishments for a given criminal act, and then, after an offender is convicted, a judge chooses the actual punishment from this range. The purpose of the model is to provide an

[2] Other aspects of the process include the behavior of prosecutors (which is examined in the literature on plea bargaining) and parole boards. See the references in Polinsky and Shavell (2000a).
[3] We ignore imprisonment but expect that the general conclusions carry over to that case.
[4] In standard economic models of crime, both p and s are chosen. In reality, however, the punishment and probability of apprehension are chosen by separate government agencies, and since the focus here is on the punishment choice by legislatures and judges (neither of whom directly choose p), it does not seem inappropriate to treat p as a parameter.

explanation for this institutional structure based on the possibly differing objectives of the sentencing authority and judges.

We assume that potential offenders differ in two dimensions. The first is variation in the gain that they expect to receive from committing a criminal act. Denote this gain by g, which is distributed by $F(g)$ on $[0,\infty)$. An offender commits the act if his gain exceeds the expected sanction, ps. Changes in s thus affect the crime rate as in standard economic models of crime (i.e., an increase in s lowers the crime rate holding p fixed), reflecting the deterrent effect of punishment.

The second difference among offenders captures their prior criminal record, as reflected by the random variable θ. According to the sentencing guidelines (Champion, 1989), differences in θ dictate differences in punishment for a given criminal act, with repeat offenders receiving harsher punishments, all else equal.[5] Since we focus here on a particular crime, this variation will be the sole factor that determines the appropriate (or "fair") punishment once an offender has been apprehended and convicted. To capture the social gain from imposing the appropriate punishment ex post, we define the fairness function $v(s,\theta)$, which we assume, following Polinsky and Shavell (2000b), is single-peaked in s.[6] Thus, for a given θ, the optimal ex post punishment, $s^*(\theta)$, occurs at the peak of v. That is, $s^*(\theta)$ solves the equation $v_s(s,\theta)=0$, where $v_s>0$ for $s<s^*(\theta)$ and $v_s<0$ for $s>s^*(\theta)$.[7] We also assume that v shifts rightward in θ, implying that $s^*(\theta)$ is

[5] Although an appealing practice on fairness grounds, it turns out to be rather difficult to justify increasing punishments for repeat offenders in terms of deterrence. See, for example, Emons (2003).
[6] Also see Wittman (1974) and Miceli (1991). On the theory of retribution, see Hart (1968, Chapter IX) and Posner (1983, Chapter 8).
[7] We assume that $v_{ss}<0$ for all s.

increasing in θ.[8] Higher values of θ should therefore be interpreted as a worse criminal record, thus dictating a more severe sentence. Let θ be distributed by $Z(\theta)$ on $[0,\infty)$.[9]

2.1. The Behavior of Judges

Consider first the motivation of judges when imposing a sentence on a convicted offender. We assume that judges are concerned solely with fairness (as embodied by the $v(s,\theta)$ function) in the sense that they want to impose the most appropriate ex post punishment, given the nature of the crime and the offender's type.[10] Thus, they are not concerned at all with deterrence *per se* (i.e., they take the crime rate as given). According to the sentencing guidelines, however, the discretion of judges is constrained by lower and upper bounds on s, as dictated by the sentencing authority.[11] Let these bounds be given by $\underline{s}$ and $\overline{s}$, respectively. Thus, once an offender has been apprehended and convicted of a particular crime, the judge first observes θ and then chooses s to solve the following ex post problem:

$$\text{Max } v(s,\theta) \quad \text{subject to } \underline{s} \le s \le \overline{s}. \tag{1}$$

The solution to this problem involves three ranges of θ as dictated by the constraints on s.

First, in the range where neither constraint is binding, judges will clearly choose the optimal ex post sentence, $s^*(\theta)$. This solution is relevant for $\theta \in [\underline{\theta}, \overline{\theta}]$, which defines

[8] Specifically, $\partial s^*/\partial\theta = -v_{s\theta}/v_{ss}$. Since $v_{ss}<0$, a positive sign of this derivative requires $v_{s\theta}>0$.

[9] We assume that $F(g)$ and $Z(\theta)$ are independent distributions. In reality, one might expect a positive correlation between g and θ since offenders with more criminal experience might have better opportunities. We abstract from this possibility to keep the model simple.

[10] This does not mean that judges do not take account of the harm caused by a particular crime when setting punishment. Indeed, one notion of fairness would set $s=h$. Note that this reveals an important source of tension between fairness and deterrence, given that optimal deterrence would set $s=h/p$ according to the "deterrence ideal" (Polinsky and Shavell, 2000b). Thus, the optimally deterring punishment will tend to be unfairly harsh given $p<1$.

the range of offender types for whom the sentencing constraints are not binding. Thus, $\underline{\theta}$ is defined by $v_s(\underline{s}, \underline{\theta})=0$, and $\overline{\theta}$ is defined by $v_s(\overline{s}, \overline{\theta})=0$. Note that $v_s(s^*(\theta), \theta)=0$ for all θ in this range. Second, for $\theta < \underline{\theta}$, the lower bound on s is binding, so judges are forced to choose $\underline{s}$, where $\underline{s} > s^*(\theta)$. Thus, $v_s(\underline{s}, \theta)<0$ for all θ in this range. Finally, for $\theta > \overline{\theta}$, the upper bound on s is binding, forcing judges to choose $\overline{s}$, where $\overline{s} > s^*(\theta)$. Thus, $v_s(\overline{s}, \theta)>0$ for all θ in this range. These results are illustrated in Figure 1.

2.2. Optimal Sentencing Guidelines when Society Cares only about Fairness

The preceding analysis has described the optimization of judges as constrained by the sentencing guidelines. We now move back in time to consider the choice of those guidelines by the legislature, or sentencing authority (which we assume reflects the objectives of society), taking the behavior of judges as given. We assume initially that the sentencing authority is solely concerned with fairness as captured by the function $v(s, \theta)$. However, because it chooses the sentencing guidelines before the identity of individual offenders is known, it can only form an expected value of this function as determined by the distribution of offender types. This expected value is given by

$$W_f = \int_0^{\underline{\theta}} v(\underline{s}, \theta) dZ(\theta) + \int_{\underline{\theta}}^{\overline{\theta}} v(s^*(\theta), \theta) dZ(\theta) + \int_{\overline{\theta}}^{\infty} v(\overline{s}, \theta) dZ(\theta) . \qquad (2)$$

The optimal choices of $\underline{s}$ and $\overline{s}$ maximize this function. Taking the derivative of this expression with respect to $\underline{s}$ and $\overline{s}$ and canceling terms yields

$$\frac{\partial W_f}{\partial \underline{s}} = \int_0^{\underline{\theta}} v_s(\underline{s}, \theta) dZ(\theta) < 0 \qquad (3)$$

[11] See Freed (1992), who argues that the guidelines have been perceived by judges as overly restrictive,

$$\frac{\partial W_f}{\partial \bar{s}} = \int_{\bar{\theta}}^{\infty} v_s(\bar{s}, \theta) dZ(\theta) > 0\,, \tag{4}$$

where the signs result from the optimizing behavior of judges. It follows that $\underline{s}=0$ and $\bar{s} \to \infty$, which establishes the following result:

Proposition 1: When society cares only about fairness, the sentencing authority should impose no limits on the discretion of judges.

Of course, this makes sense since the objective of judges is perfectly aligned with that of society, so they will choose the optimal ex post ("fairest") sanction for all offenders. Thus, there is no reason to impose any constraints on their behavior. However, this will not generally achieve the optimal level of deterrence, given that deterrence depends only on the offender's gain from a criminal act compared to the harm that it imposes on society, neither of which is necessarily related to the offender's "type." Thus, the fact that judges do not have unlimited discretion in practice suggests that fairness alone cannot be the goal of the sentencing authority. We therefore introduce deterrence in the next section.

2.3. Optimal Sentencing Guidelines when Society Cares only about Deterrence

We introduce deterrence into the model in the standard way (Polinsky and Shavell, 2000a). As noted above, potential offenders differ in their gains from committing a crime, as characterized by the distribution *F(g)*. If the expected sanction is *ps*, then only those offenders for whom $g \geq ps$ will commit crimes, each of which causes

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thus interfering with the goal of proportionality.

social harm of h. Of course, the actual sanction is determined by judicial optimization in the manner described above. We initially consider the case where society cares only about deterrence in order to ask whether a strict divergence in interests between society and judges underlies the observed structure of sentencing. This leads to the following welfare function for society based purely on the goal of deterrence

$$W_d = Z(\underline{\theta})\int_{p\underline{s}}^{\infty}(g-h)dF(g) + \int_{\underline{\theta}}^{\bar{\theta}}\int_{ps^*(\theta)}^{\infty}(g-h)dF(g)dZ(\theta) + [1-Z(\bar{\theta})]\int_{p\bar{s}}^{\infty}(g-h)dF(g)\,. \quad (5)$$

Taking the derivative of this expression with respect to $\underline{s}$ and $\bar{s}$ and canceling terms yields

$$\frac{\partial W_d}{\partial \underline{s}} = Z(\underline{\theta})(p\underline{s}-h)f(p\underline{s})p = 0 \quad (6)$$

$$\frac{\partial W_d}{\partial \bar{s}} = [1-Z(\bar{\theta})](p\bar{s}-h)f(p\bar{s})p = 0\,. \quad (7)$$

It follows that

$$\underline{s} = \bar{s} = h/p. \quad (8)$$

where h/p represents the so-called "deterrence ideal" (Polinsky and Shavell (2000b)). We can therefore state

Proposition 2: When society cares only about deterrence, the sentencing authority should set a single sanction equal to h/p.

As a result, judges have no ex post discretion to tailor sanctions to offender types, but instead must impose the same sanction on all offenders committing a given criminal act.[12] It follows that actual sentencing guidelines, which, even after reform, continue to allow some discretion, cannot be driven entirely by a concern for deterrence.

2.4. Optimal Sentencing Guidelines when Society Cares about Fairness and Deterrence

It is evident from the preceding analysis that the objectives of fairness and deterrence in isolation imply dramatically different policies with regard to sentencing. While fairness is best served by allowing complete discretion on the part of judges to tailor sentences to the characteristics of offenders ex post, deterrence suggests that a single sentence should be set ex ante, leaving judges with no discretion. However, neither of these approaches is consistent with actual practice. We now show, however, that when social welfare depends on both fairness and deterrence, the observed sentencing structure, under which judges have limited discretion to choose sentences from within a prescribed range, emerges as optimal.

The width of the sentencing range—i.e., the extent of judicial discretion—will depend, among other things, on the relative weights given to fairness and deterrence. We therefore parameterize this weight, letting α be the weight given to deterrence and $1-\alpha$ the weight given to fairness. The resulting hybrid social welfare function is written[13]

[12] This, of course, relies on the assumption that *h* and *p* are the same for all offenders committing a given offense.

[13] Aside from the parameterization of the weights on fairness and deterrence, this specification differs from that in Polinsky and Shavell (2000b) by not including the fairness function inside the second integral. In placing $v(s,\theta)$ inside that intergral, Polinsky and Shavell thus interpret $v(s,\theta)$ as the benefits of fairness per crime, and then aggregate over all crimes committed. While this approach has some appeal, it leads to the odd result that when fairness matters, society may actually want to deter less crime compared to a pure deterrence model because the harm from crime is partially offset by the fairness benefits derived from punishing the offender. In this sense, fairness is inseparable from deterrence in terms of the choice of the

$$W = \int_0^{\underline{\theta}} \left[\alpha \int_{p\underline{s}}^{\infty} (g-h)dF(g) + (1-\alpha)v(\underline{s},\theta) \right] dH(\theta) +$$

$$\int_{\underline{\theta}}^{\bar{\theta}} \left[\alpha \int_{ps(\theta)}^{\infty} (g-h)dF(g) + (1-\alpha)v(s^*(\theta),\theta) \right] dH(\theta) +$$

$$\int_{\bar{\theta}}^{\infty} \left[\alpha \int_{p\bar{s}}^{\infty} (g-h)dF(g) + (1-\alpha)v(\bar{s},\theta) \right] dH(\theta). \qquad (9)$$

Note that, as in the previous models, this function reflects the ex post optimization of judges, subject to the sentencing guidelines. The problem facing the sentencing authority is once again to choose those guidelines to maximize social welfare.

After canceling terms, the first-order conditions for $\underline{s}$ and $\bar{s}$, respectively, are given by

$$H(\underline{\theta})\alpha(p\underline{s} - h)f(p\underline{s})p = \int_0^{\underline{\theta}} (1-\alpha)v_s(\underline{s},\theta)dH(\theta) \qquad (10)$$

$$[1-H(\bar{\theta})]\alpha(p\bar{s} - h)f(p\bar{s})p = \int_{\bar{\theta}}^{\infty} (1-\alpha)v_s(\bar{s},\theta)dH(\theta). \qquad (11)$$

Consider first condition (10). Note that the right-hand side is negative by the fact that $v_s(\underline{s},\theta)<0$ for all $\theta<\underline{\theta}$ (see Figure 1). It follows that $p\underline{s} - h<0$, or $\underline{s} < h/p$. In contrast, the right-hand side of (11) is positive by the fact that $v_s(\bar{s},\theta)<0$ for all $\theta>\bar{\theta}$. Thus, $p\bar{s} - h>0$, or $\bar{s} > h/p$. This proves the following result:

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optimal sanction. In contrast, the current specification treats fairness and deterrence as truly separable by measuring fairness independently of the crime rate. (One may think of it as reflecting the fairness of the "punishment regime.") We show in the Appendix, however, that under plausible assumptions, the Polinsky and Shavell approach leads to qualitatively similar results to those presented in the text (specifically, to the existence of an optimal sentencing range).

Proposition 3: When society cares about fairness and deterrence, the optimal sentencing guidelines satisfy the condition $\underline{s} < h/p < \bar{s}$.

Thus, judges retain some discretion in sentencing in order to pursue fairness, but concern for deterrence limits their discretion to a range that includes the deterrence ideal. We now consider how changes in the parameters of the model affect this range.

Comparative static analysis of (10) and (11) yields the following results[14]

$$\frac{\partial \underline{s}}{\partial \alpha} > 0, \qquad \frac{\partial \bar{s}}{\partial \alpha} < 0 \tag{12}$$

$$\frac{\partial \underline{s}}{\partial h} > 0, \qquad \frac{\partial \bar{s}}{\partial h} > 0 \tag{13}$$

$$\frac{\partial \underline{s}}{\partial p} \gtreqless 0, \qquad \frac{\partial \bar{s}}{\partial p} < 0 \,. \tag{14}$$

According to (12), as the weight on deterrence in social welfare increases, the sentencing constraints tighten, moving closer to the deterrence ideal of h/p. Of course, this is intuitively appealing since the pure deterrence model emerges as a special case of the general model when α=1. According to (13), both the lower and upper bounds increase with h, the social harm from crime. This also makes sense since an increase in h, holding p fixed, increases the deterrence ideal. Thus, the lower and upper bounds shift with it. (In practice, this shift is reflected by movement down the sentencing table, holding the defendant's type fixed.)

Finally, consider an increase in p, holding h fixed. This should have the reverse effect of increasing h because it lowers the deterrence ideal. As (14) shows, however,

[14] This assumes that the second-order conditions hold, and that $f' \to 0$ for all g (i.e., $f(g)$ is uniform or nearly so).

this does not necessarily happen. While the upper bound decreases as predicted, the lower bound may increase or decrease. This is due to opposing effects. The increase in p has the expected effect of lowering both bounds by decreasing h/p, but it also has the effect of tightening the bounds by making deterrence more effective, all else equal. (In this sense, an increase in p has the same effect as an increase in α.) These effects are offsetting with regard to the lower bound but reinforcing with regard to the upper bound.

3. Implications of the Analysis in Light of Sentencing Reform

The Comprehensive Crime Control Act (Public Law 98-473), passed by Congress in 1984, created the U.S. Sentencing Commission for the purpose of reforming criminal sentencing procedures. The resulting federal sentencing guidelines, which mirrored reforms enacted by many states in the late 1970s and early 1980s, imposed much tighter limits on the discretion of judges compared to the earlier system of "indeterminate sentencing" (Cooter and Ulen, 2004: p. 496). Under the guidelines, the prescribed sentences are dictated by a table, which lists the seriousness of the offense along the vertical axis and the offender's criminal history along the horizontal axis. As an illustration, a portion of the table is reproduced in Figure 2, where sentence lengths are listed in months (U.S. Sentencing Commission, 2003: Chapter 5).[15] Note that average sentences are increasing both in the seriousness of the crime and the offender's criminal record.

The stated objectives of sentencing reform were fourfold: to promote deterrence, incapacitate dangerous offenders, impose just punishments, and rehabilitate offenders

[15] The model in Section 2 therefore considered a single row of the table—that is, variation in the offender's history (θ) while holding fixed the seriousness of the crime (h).

(Champion, 1989, xi-xii). Of course, no single sentencing policy can simultaneously satisfy all of these goals, so the question becomes how to balance them in an optimal way.

Adelstein (1981) has argued that the criminal justice system has responded to the conflicting goals of punishment by evolving an institutional structure of sentencing that permits a balance between discretion and predictability. In particular, adjustments in the degree of judicial discretion (as regulated by the tightness of legislative sentencing guidelines) allow the system to adapt to changing social values concerning optimal punishment. The analysis in Section 2 focused on the trade-off between fairness and deterrence within this framework.[16] Specifically, the hybrid model implied that greater judicial discretion increased fairness by allowing judges to tailor sentences to the circumstances of individual offenders ex post, while tighter guidelines promoted deterrence by narrowing the sentencing range around the deterrence ideal.

Other authors, however, have argued that the effects work in the opposite direction. For example, Easterbrook (1983) and Posner (2003: pp. 579-580) contend that greater discretion actually promotes deterrence by allowing judges to practice a form of efficient "price discrimination" (i.e., to impose harsher sentences on offenders who are more difficult to deter and vice versa), while Schulhofer (1988) claims that less discretion serves the goal of fairness by eliminating unwarranted disparities in sentencing.

The competing theories therefore yield opposing predictions about how the criminal justice system should respond to a given change in social values. In the case of

[16] Waldfogel (1993) has empirically examined whether criminal punishment is motivated by deterrence or fairness by comparing actual sentences for various crimes with those implied by the competing theories. His results suggest that neither theory alone is correct, which is consistent with the argument that the system is seeking to balance deterrence and fairness.

sentencing reform, the hybrid model implies that the resulting tightening of the sentencing guidelines reflected an increased demand for deterrence, whereas the alternative model implies that it was an effort to achieve fairer punishments. Which theory better describes the actual impetus for reform? While it is impossible to provide a definitive answer to this question because social values are unobservable, we may be able to infer how they changed and thereby ascertain which theory is more correct.

To that end, consider Figure 3, which graphs the total number of crimes and the crime rate (crimes/100,000) in the United States during the period 1957 -2001. Note that the rate rose steadily until about 1980, after which it leveled off somewhat, and then began to decline in the 1990s. Now recall that the trend toward determinate sentencing began at the state level in the late 1970s and continued into the early 1980s. It therefore coincides with a period of high and rising crime rates, making it plausible to argue that reform was a response to a demand for increased deterrence rather than for fairer punishments. This provides some evidence that the hybrid model is more descriptive of the institutional structure of criminal sentencing in the presence of conflicting social goals.

4. Conclusion

This paper represents a first attempt to model explicitly the interplay between legislatures and judges in determining criminal punishments. Historically, legislatures have set broad sentencing guidelines within which judges were able to exercise considerable discretion regarding the choice of actual sentences. There has been considerable debate, however, about the optimal degree of judicial discretion, which has

depended both on conflicting goals regarding the social function of criminal punishment—is it aimed at deterring crime or imposing fair penalties?—and disagreement about the impact of discretion on those goals—does discretion promote deterrence or fairness?

This paper argued that the actual institutional structure of punishment can best be understood as an effort to balance deterrence and fairness. In particular, greater stringency of the sentencing guidelines promotes deterrence by narrowing the range around the deterrence ideal, while greater judicial discretion serves fairness by allowing judges to tailor sentences to case-specific factors. The observation that sentencing reform in the late 1970s and early 1980s (which greatly curtailed discretion) occurred during a period of high and rising crime rates is evidence in favor of this interpretation.

Appendix

Following Polinsky and Shavell (2000b), the welfare function in the hybrid model may alternatively be written as

$$W = \int_0^{\underline{\theta}} \int_{p\underline{s}}^{\infty} [\alpha(g-h) + (1-\alpha) pv(\underline{s},\theta)] dF(g) dZ(\theta) +$$

$$\int_{\underline{\theta}}^{\bar{\theta}} \int_{ps^*(\theta)}^{\infty} [\alpha(g-h) + (1-\alpha) pv(s^*(\theta),\theta)] dF(g) dZ(\theta) +$$

$$\int_{\bar{\theta}}^{\infty} \int_{p\bar{s}}^{\infty} [\alpha(g-h) + (1-\alpha) pv(\bar{s},\theta)] dF(g) dZ(\theta), \qquad \text{(A1)}$$

where here, fairness is measured on a per crime basis and aggregated across all crimes.[17] Maximizing (A1) with respect to $\underline{s}$ and $\bar{s}$ yields the first-order conditions

$$\int_0^{\underline{\theta}} [\alpha(p\underline{s} - h) + (1-\alpha) pv(\underline{s},\theta)] f(p\underline{s}) dZ(\theta) =$$

$$[1 - F(p\underline{s})] \int_0^{\underline{\theta}} (1-\alpha) v_s(\underline{s},\theta) dZ(\theta), \qquad \text{(A2)}$$

$$\int_{\bar{\theta}}^{\infty} [\alpha(p\bar{s} - h) + (1-\alpha) pv(\bar{s},\theta)] f(p\bar{s}) dZ(\theta) =$$

$$[1 - F(p\bar{s})] \int_{\bar{\theta}}^{\infty} (1-\alpha) v_s(\bar{s},\theta) dZ(\theta). \qquad \text{(A3)}$$

Consider first (A2). Note that the right-hand side is negative given the optimizing behavior of judges, implying that

$$Z(\underline{\theta})\alpha(p\underline{s} - h) + (1-\alpha) \int_0^{\underline{\theta}} pv_s(\underline{s},\theta) dZ(\theta) < 0. \qquad \text{(A4)}$$

[17] We assume that $v(0,\theta)=0$ for all θ.

Rearranging yields

$$\underline{s} < h/p - \frac{1-\alpha}{\alpha}\frac{\int_0^{\underline{\theta}} v(\underline{s},\theta)dZ(\theta)}{Z(\underline{\theta})},$$

or

$$\underline{s} < h/p - \frac{1-\alpha}{\alpha}\mathrm{E}[v(\underline{s},\theta) \mid \theta < \underline{\theta}]. \qquad \text{(A5)}$$

Similarly, the right-hand side of (A3) is positive given judicial optimization, which, after rearranging and simplifying, implies

$$\bar{s} > h/p - \frac{1-\alpha}{\alpha}\mathrm{E}[v(\bar{s},\theta) \mid \theta > \bar{\theta}]. \qquad \text{(A6)}$$

According to conditions (A5) and (A6), that the lower and upper bounds on *s* should be set, respectively, below and above some "ideal" sanction that equals the deterrence ideal, *h/p*, minus an extra term reflecting the expected fairness benefits from imposing sanctions.[18] Note that the adjustment factor may differ in the two expressions. In (A5) it is the expected benefits of imposing a sanction of $\underline{s}$ on criminals at the low end of the θ distribution (i.e., over-punishing those with a short record), while in (A6) it is the expected benefits of imposing $\bar{s}$ on those at the high end of the distribution(i.e., under-punishing those with a long criminal record). *If these benefits are roughly equal in magnitude, then* $\underline{s} < \bar{s}$ *, as we proved in the text.*

Finally, note the if α=1 (i.e., only deterrence matters), then $\underline{s} = \bar{s} = h/p$, and judges are given no ex post discretion as in the pure deterrence model. It is *not* necessarily the

[18] These extra terms lower the optimal sanction compared to the deterrence ideal because the fairness benefits from punishment reduce the overall social harm from each crime that is committed. Polinsky and Shavell (2000b) refer to the adjusted sanction (the right-hand sides of (A5) and (A6)) as the "full deterrence ideal."

case, however, that if α=0 judges would be given complete discretion, as was true in the pure fairness model in the text. While the optimal lower bound on s is zero, it is not generally optimal to make the upper bound maximal because doing so would reduce the overall crime rate, thereby depriving society of some of the fairness gains from punishment. Again, this is a consequence of using a welfare function that measures fairness on a per crime basis.

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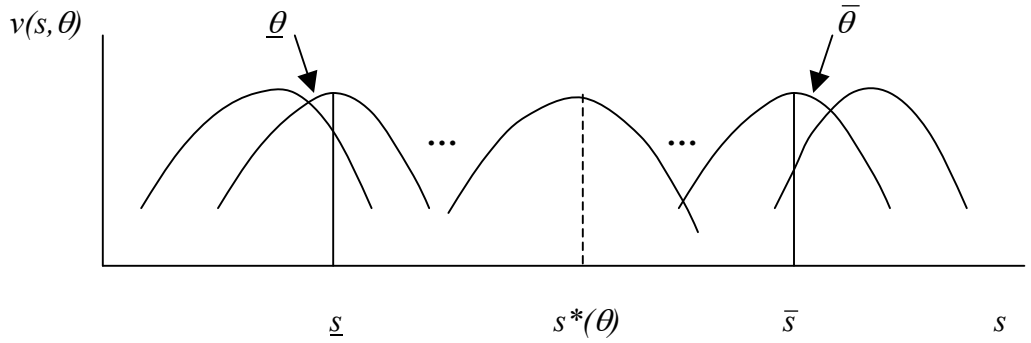

Figure 1. Optimal ex post sentencing by judges subject to sentencing guidelines.

Criminal history

	I	II	III	IV	V	VI
Offense level						
1	0-6	0-6	0-6	0-6	0-6	0-6
2	0-6	0-6	0-6	0-6	0-6	1-7
3	0-6	0-6	0-6	0-6	2-8	3-9
4	0-6	0-6	0-6	2-8	4-10	6-12
5	0-6	0-6	1-7	4-10	6-12	9-15
6	0-6	1-7	2-8	6-12	9-15	12-18

Figure 2. Sample sentencing table, listing sentencing ranges (in months) as a function of offense level and criminal history.