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Steven Shavell*

Abstract:

Discretion is examined as a feature of the design of rule-guided systems. That is, given that rules have to be administered by some group of persons, called adjudicators, and given that their goals may be different from society's (or a relevant organization's), when is it socially desirable to allocate discretionary authority to the adjudicators and, if so, to what extent? The answer reflects a tradeoff between the informational advantage of discretion -- that adjudicators can act on information not included in rules -- and the disadvantage of discretion -- that decisions may deviate from the desirable because adjudicators' objectives are different from society's. The control of discretion through limitation of its scope, through decision-based payments to adjudicators, and through the appeals process, is also considered.

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1. Introduction

As a matter of common observation, it seems that some power of discretion is usually enjoyed by those who apply rules in our legal and other rule-based systems. Adjudicators typically enjoy a measure of discretion when considering what conduct will be allowed in litigation or what decision is appropriate. Likewise, when police officers consider whether to issue tickets to drivers, supervisors contemplate whether to promote employees, or college admissions officers determine whether to accept applicants, their decisions are to an extent theirs to make even though they operate against a background of rules.

In this article discretion is examined as a feature of the design of rule-guided systems. That is, given that rules have to be administered by some group of persons, called adjudicators, and given that their goals may be different from society's (or a relevant organization's),¹ when is it socially desirable to allocate discretionary authority to the adjudicators and, when so, to what extent?

In section 2, I consider a simple model of the application of rules by adjudicators in which discretion can be examined. In this model, a rule can depend only on certain included variables but not on unincluded variables. Granting discretion to adjudicators permits them to make decisions that reflect the unincluded variables (such as the degree

¹ On the motivations of adjudicators, see Richard A. Posner, What Do Judges and Justices Maximize? (The Same Thing Everybody Else Does) 3 Supreme Court Economic Review 1 (1993), and section 3.1 of the survey, Lewis Kornhauser, Judicial Organization and Administration in 5 Encyclopedia of Law and Economic (2000).

of remorse shown by a criminal defendant, or the personal qualities displayed by a college applicant in an interview), because adjudicators are assumed to be able to observe these variables. If it would be socially desirable for decisions to depend upon the information bound up in the unincluded variables, giving discretion to adjudicators may be beneficial. The disadvantage of permitting discretion concerns discretionary deviation, that adjudicators may not use the information in the unincluded variables to make decisions as society would want but rather to further their own objectives (a judge might favor more lenient punishment than does society, a college admissions officer might favor demonstrated poise in the interview more than the college does). Discretion is desirable to accord to adjudicators when this disadvantage is outweighed by the foregoing informational advantage.

It should be remarked that the source of the potential advantage of allowing discretion is that some variables are not included in rules but are observed by adjudicators. There are two justifications for this assumption. One is simply that certain variables would be difficult for a higher authority to verify (for example, the demeanor of a criminal defendant). The other is that the framers of a rule (such as a legislative body) may have found it impractical to spell out how a (perhaps verifiable) variable ought to affect decisions (for example, whether a rule prohibiting use of moving vehicles in a park is meant to apply to electric-powered bicycles).

In section 3, I ask how discretion can be controlled by means of restricting its scope, that is, by constraining the set of decisions that adjudicators are permitted to make. (For instance, the sentence for a crime could be required to lie in the range between one and five years.) Limiting the scope of discretion may be useful because it prevents

substantial discretionary deviation (a sentence of less than one year or more than five years), and it is shown, among other things, that a positive scope of discretion is desirable to grant under quite general conditions. Still, restricting the scope of discretion is a relatively blunt method of control because, by definition, it has no effect on deviation within the allowed scope of decisions (sentences between one and five years) and also because the exercise of discretion outside the permitted bounds would sometimes be desirable.

In section 4, I consider another way of controlling discretion, through a decision-based incentive, namely, a scheme for rewarding or penalizing adjudicators that is based on their decisions. (For example, adjudicators could be given enhanced promotion possibilities for imposing lower sentences.) Decision-based incentives can counter discretionary deviation in a broader and more nuanced way than limiting the scope of discretion, since decision-based incentives may influence the entire range of decisions (they can be designed to lead adjudicators to affect all sentences, whereas limiting the scope of discretion only affects sentences by ruling out a class of sentences). It is demonstrated that discretion is always optimal to grant when decision-based incentives can be employed, given the assumptions of the model. However, use of decision-based incentives cannot generally eliminate the problem of discretionary deviation because decision-based incentives do not depend on the unincorporated variables.

In section 5, I analyze the implicit control of discretion through the appeals process, whereby a disappointed litigant can ask a higher authority to reconsider the adjudicator's decision. Because the adjudicator can anticipate that a decision that deviates from the socially appropriate one would be appealed if the deviation is large

enough to outweigh the cost of an appeal, the adjudicator will be led to keep his deviations below the point at which appeals would be provoked. Thus, the appeals process induces decisions to conform to the socially desirable, at least within the range governed by the cost of an appeal.²

In section 6, I make several concluding comments.

Prior legal literature on the discretion of adjudicators is extensive and reflects the theme of this article, that granting discretion involves a compromise between allowing adjudicators to make use of information that they have yet that also permits them to deviate from what society would want.³ In the law and economics literature, a number of articles have dealt with the discretion of adjudicators in particular contexts, but have not addressed the general issue studied here.⁴ In regard to the economics literature, the subject of the discretion of adjudicators may be viewed as a kind of principal and agent or delegation problem (since society can be regarded as a principal and an adjudicator as an agent).⁵

² This is the theme that is elaborated in Steven Shavell, *The Appeals Process and Adjudicator Incentives* (2004).

³ See, for example, chapter 1 of Kenneth Culp Davis, *Discretionary Justice: A Preliminary Inquiry*, Maurice Rosenberg, *Judicial Discretion of the Trial Court, Viewed from Above*, 22 *Syracuse Law Review* 635 (1971), and chapter 7 of Frederick Schauer, *Playing by the Rules* (1991).

⁴ Jennifer F. Reinganum, *Plea Bargaining and Prosecutorial Discretion*, 78 *American Economic Review* 713 (1988) considers the discretion of prosecutors in making plea bargains, assuming that prosecutors have the same utility function as society. Even though prosecutors share the social objective, she finds that restricting their discretion may be beneficial because, in effect, it allows them to make binding commitments in bargaining with defendants. Jennifer F. Reinganum, *Sentencing Guidelines, Judicial Discretion, and Plea Bargaining*, 31 *Rand Journal of Economics* 62 (2000) also concludes that restricting judicial discretion may be desirable, for related reasons. Matthew Spitzer and Eric Talley, *Judicial Auditing*, 24 *Journal of Legal Studies* 649 (2000), and Andrew F. Daughety and Jennifer F. Reinganum, *Speaking Up: A Model of Judicial Dissent and Discretionary Review* (2004) focus on the exercise of discretion by appeals courts over whether to review lower court decisions, in other words, on a very different issue (that of policing the lower courts) from that of concern here.

⁵ In the general principal and agent literature (see, for example, John Pratt and Richard Zeckhauser, *Principals and Agents: The Structure of Business* (1991)) it is usually assumed that the

2. Basic Analysis

Assume that there are two parties, the state and an adjudicator. The adjudicator has the task of making a decision. The state's welfare, social welfare, depends on the decision that the adjudicator makes and on the two variables, an included variable (such as whether a defendant stole a car) and an unincluded variable (such as his demeanor).⁶ The adjudicator's utility also depends on the decision and on the two variables.⁷ The adjudicator observes both variables. The state observes the adjudicator's decision and the included variable but not the unincluded variable. However, the included variable will be suppressed in the notation, for the analysis below is conditional on the value of the included variable (see note 11). Define the following:

d = adjudicator's decision; d is in the interval $[0, d_m]$;

y = unincluded variable; y is in the interval $[0, y_m]$;

$f(y)$ = probability density of y ; f is positive on $[0, y_m]$;

$w(y, d)$ = social welfare; w is concave in d ;

principal observes his own payoff, whereas here it is assumed that the principal, society, cannot observe its payoff (for instance, the social consequences of sentencing a person to a term of imprisonment); see section 6(a) and (b) below for further discussion. The model here is a version of a delegation problem, as analyzed in articles on delegation, communication, and the internal organization of firms; see, for example, Vincent Crawford and Joel Sobel, Strategic Information Transmission, 50 *Econometrica* 1431 (1982), N. Melamud and T. Shibano, Communication in Settings with No Transfers, 22 *Rand Journal of Economics* 173 (1991), and Philippe Aghion and Jean Tirole, Formal and Real Authority in Organizations, 105 *Journal of Political Economy* 1 (1997). The particular assumptions made here lead to a fairly simple characterization of optimal discretion (but there is no communication in the model); also readers of the delegation-communication literature may find the control of discretion through decision-based incentives and through the appeals process to be of interest.

⁶ Social welfare might depend on the decision and these variables because they will have incentive effects (such as through deterrence of violations of law) and because of other types of effects (such as through incapacitation, or how the legal treatment of the individual is viewed by him and those who know the circumstances of the event).

⁷ The adjudicator's utility might depend on the decision and these variables because he cares about a (generally different) version of social welfare or because of some private interest in the outcome (such as a bribe).

$u(y, d)$ = adjudicators' utility; u is concave in d .

Let $d^*(y)$ be the first-best choice of d given y , the d that maximizes $w(y, d)$, and assume that $d^*(y)$ is continuous and increasing in y . Similarly, let $d(y)$ be the adjudicator's personally optimal choice of d given y , and assume that $d(y)$ is continuous and increasing in y (the case where the slope of $d(y)$ is opposite of that of $d^*(y)$ is of little interest⁸).

Assume here that the state chooses between two policies: either it does not allow discretion and employs a rule prescribing a decision that the adjudicator must make; or it allows the adjudicator discretion, permitting him to choose d .

If the state uses a rule to prescribe a decision, it will choose d to maximize

$$(1) \quad \int_0^{y_m} w(y, d)f(y)dy.$$

Let the d that maximizes (1) be denoted d^* .⁹

If the state allows discretion, the adjudicator will select $d(y)$, so that social welfare will be

$$(2) \quad \int_0^{y_m} w(y, d(y))f(y)dy.$$

Giving adjudicators discretion is superior to not doing so if and only if (2) is greater than or equal to (1) evaluated at d^* , or if and only if¹⁰

⁸ If $d(y)$ is decreasing in y , and thus opposite in slope from $d^*(y)$, it is readily shown that discretion cannot be desirable to grant (see note 13). The interesting case is where $d(y)$ and $d^*(y)$ have the same slope, where due to this minimal degree of similarity of adjudicator and social desires, there is a possibility that discretion would be desirable.

⁹ It is assumed for ease that d^* is unique.

¹⁰ I assume for convenience that if (2) equals (1), discretion is granted, and will make a similar assumptions below without further comment.

$$(3) \quad \int_0^{y_m} w(y, d(y))f(y)dy \geq \int_0^{y_m} w(y, d^*)f(y)dy.$$

This condition is equivalent to

$$(4) \quad \int_0^{y_m} [w(y, d^*(y)) - w(y, d(y))]f(y)dy \leq \int_0^{y_m} [w(y, d^*(y)) - w(y, d^*)]f(y)dy.$$

The left side of (4) measures the loss from first-best social welfare due to discretionary deviation – that $d(y)$ differs from $d^*(y)$. The right side measures the loss from first-best welfare due to inflexibility deviation – that d^* is a constant and thus differs from $d^*(y)$.

The two types of deviation are illustrated in Figure 1.

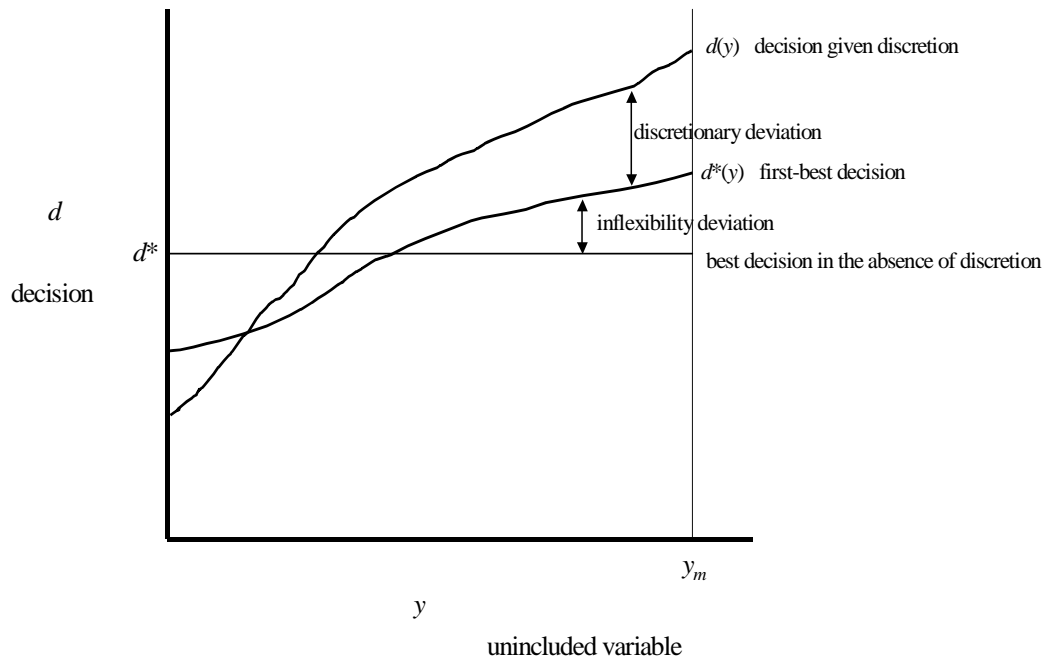


Figure 1

Inequality (4) thus states that discretion is best to allow when the expected loss due to discretionary deviation is less than that due to inflexibility deviation.¹¹ In summary, we have

¹¹ If the included variable, say x , were not suppressed in the notation, then (4) would be written

$$(4') \int_0^{y_m} [w(x, y, d^*(x, y)) - w(x, y, d(x, y))] f(y) dy < \int_0^{y_m} [w(x, y, d^*(x, y)) - w(x, y, d^*(x))] f(y) dy,$$

and the question whether or not to allow discretion would depend on the observed value of x .

PROPOSITION 1. Discretion is desirable to permit when (4) holds, that is, when the expected social welfare loss due to discretionary deviation is less than or equal to that due to inflexibility deviation.//

It follows that a sufficient condition for discretion to be desirable is that the expected loss from discretionary deviation is small enough, for the right side of (4) is positive. (Hence, a sufficient condition for discretion to be desirable is that the adjudicator's utility function is everywhere within some distance of w .) It also follows that a sufficient condition for discretion to be undesirable is that discretionary deviation is positive at a point y_o and that the probability that y is close to y_o is sufficiently high, for then prescribing $d^*(y_o)$ would be superior to allowing discretion.¹² It also is clear that discretion must be undesirable if, contrary to our assumption, $d(y)$ is declining in y .¹³

3. Scope of Discretion

It was assumed above that when discretion is given to adjudicators, they can choose any decision, but more generally they could be given the right to choose a decision only within a set of possible decisions, called the scope of discretion. Here it is assumed that the scope of discretion is an interval $[a, b]$, where $a \leq b$.¹⁴ Note that one

¹² More precisely, let there be a family of density functions $f(y; \tau)$ for which the probability mass becomes concentrated at y_o as τ grows: for any ϵ , and δ , there is a $\tau(\epsilon, \delta)$ such that for all $\tau \geq \tau(\epsilon, \delta)$, the probability that y is within ϵ of y_o is at least $1 - \delta$. Then if τ is sufficiently large, no discretion must be superior, for as $\tau \rightarrow \infty$, if no discretion is given and d is set equal to $d^*(y_o)$, social welfare tends to $w(y_o, d^*(y_o))$; whereas if discretion is granted and $\tau \rightarrow \infty$, social welfare tends to $w(y_o, d(y_o)) < w(y_o, d^*(y_o))$.

¹³ Suppose that $d(y) = d^*(y)$ at some y_o . Then disallowing discretion and requiring $d = d^*(y_o)$ is superior to allowing discretion; for (it is evident from examining the graphs that) $d^*(y_o)$ is superior to $d(y)$ at all y different from y_o . Also, if $d(y)$ is everywhere above or everywhere below $d^*(y)$, it is obvious that disallowing discretion is best.

¹⁴ This is a simplifying assumption. As a general matter, the optimal scope of discretion might not be an interval.

possibility is that $a = b$, in which case the adjudicator has no discretion; if $a < b$, the adjudicator is said to have positive discretion. Without loss of generality, we can restrict attention to intervals contained in the range of $d(y)$, that is, within $[d(0), d(y_m)]$.¹⁵

Figure 2 illustrates how the adjudicator behaves given the scope of discretion.

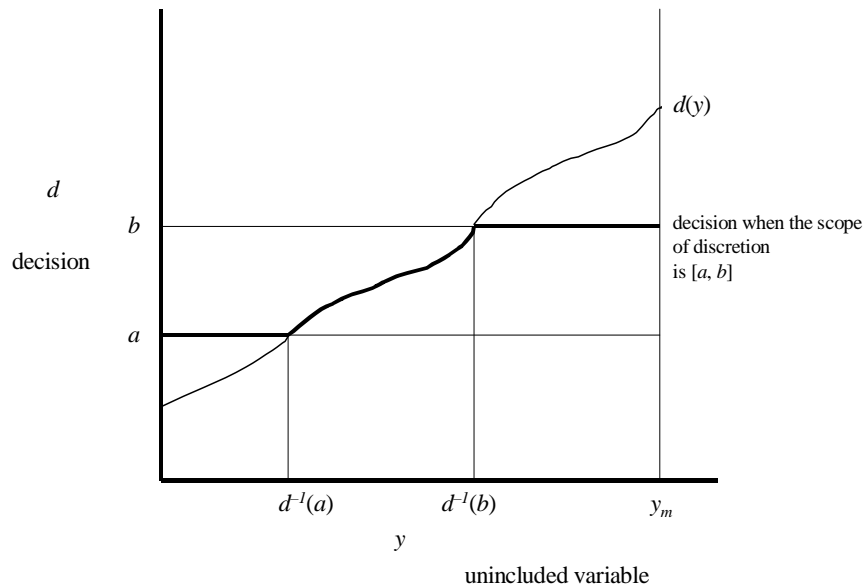


Figure 2

¹⁵ Any interval not contained in $[d(0), d(y_m)]$ is equivalent to an interval in it. In particular, if $a < d(0)$, then $[a, b]$ is equivalent to $[d(0), b]$ for the adjudicator will make the same choices given $[d(0), b]$ as he would given $[a, b]$; and if $b > d(y_m)$, the adjudicator will make the same choices given $[a, d(y_m)]$ as he would given $[a, b]$.

In particular, if $d(y) < a$, he chooses a (since $u(y, d)$ is concave in d); if $d(y)$ is in $[a, b]$, he chooses $d(y)$; and if $d(y) > b$, he chooses b (again, since $u(y, d)$ is concave in d). Social welfare given $[a, b]$ is

$$(5) \quad \int_0^{d^{-1}(a)} w(y, a)f(y)dy + \int_{d^{-1}(a)}^{d^{-1}(b)} w(y, d(y))f(y)dy + \int_{d^{-1}(b)}^{y_m} w(y, b)f(y)dy.$$

(Note that because it is assumed that $[a, b]$ is contained in $[d(0), d(y_m)]$, $d^{-1}(a)$ and $d^{-1}(b)$ are defined.)

Let $[a^*, b^*]$ be the optimal scope of discretion, corresponding to the a and b that maximize (5). The following result, which is shown in the appendix, describes the optimal scope of discretion.

PROPOSITION 2. (a) The optimal scope of discretion $[a^*, b^*]$ might be such that the adjudicator has no discretion (that is, $a^* = b^*$) or such that he has positive discretion (that is, $a^* < b^*$).

(b) A sufficient condition for a positive scope of discretion to be optimal is that the adjudicator would want to choose d^* for some interior y , specifically, that $d(y) = d^*$ for some y in $(0, y_m)$.

(c) The optimal scope of discretion must be contained in the first-best range of decisions $[d^*(0), d^*(y_m)]$.

(d) If the adjudicator might choose a decision outside the first-best range $[d^*(0), d^*(y_m)]$, then the optimal scope of discretion must lie strictly within it: if $d(0) < d^*(0)$, then $a^* > d^*(0)$; and if $d(y_m) > d^*(y_m)$, then $b^* < d^*(y_m)$.//

Part (a) states that no discretion at all might be optimal, even though the degree of positive discretion can be arbitrarily small. No discretion would clearly be best when, for instance, the adjudicator's decisions would always lie outside the range of first-best

decisions. However, one would expect some degree of discretion to be desirable when the adjudicator's choices somewhat resemble society's, and this is given content by part (b).

Part (b) states that as long as $d(y)$ crosses the d^* line, as is illustrated in Figure 1, positive discretion is optimal. This condition is a minimal one, for it requires only that the range of $d(y)$ not be entirely disparate from that of $d^*(y)$. The actual argument for why positive discretion is desirable given the condition can be understood from the graph of $d(y)$ shown in Figure 3.

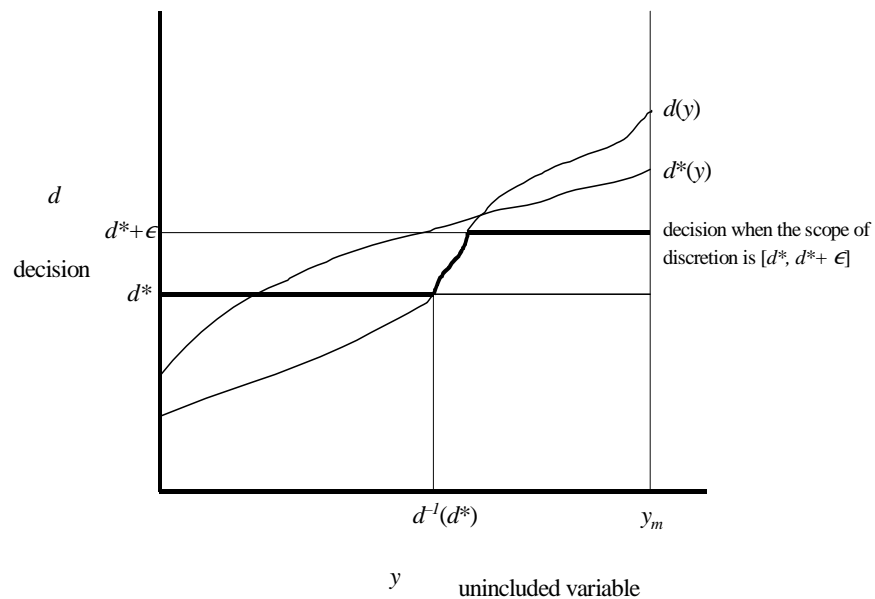


Figure 3

If we start from no discretion with the decision prescribed to be d^* , and consider the interval $[d^*, d^* + \epsilon]$ one can see that the graph of the decisions will be as illustrated. This must raise welfare in the region to the right of $d^{-1}(d^*)$, where d is raised, since d^* is below $d^*(y)$ in that region. (A similar argument applies if $d^* \geq d^*(d^{-1}(d^*))$.)

Of note about parts (c) and (d) is that they indicate when constraining the scope of discretion from full discretion is desirable. Part (c) states the obvious point that it cannot

be desirable to allow decisions to be made that could not possibly be optimal, so that if unconstrained discretion would lead to such decisions – if $d(0) < d^*(0)$ or if $d(y_m) > d^*(y_m)$ – then constraining the scope of discretion must be advantageous. Part (d) states the less obvious point that in the named circumstances, the scope of discretion must be strictly inside the first-best range $[d^*(0), d^*(y_m)]$. The explanation for this conclusion is that, were the upper limit b (the argument regarding the lower limit is the same) set equal to $d^*(y_m)$, there would be no first-order loss in welfare from a reduction in the limit b even when $y = y_m$, but there is a first-order gain in welfare from reducing b when the adjudicator would choose an excessive decision at y_m .

4. Decision-based Incentives.

Another means of controlling adjudicator’s decision is to give him a payoff based on his decision – a decision-based incentive; let

$$r(d) = \text{payment to the adjudicator,}$$

where $r(d)$ is any function of d and the utility of the adjudicator is assumed to be additive in $r(d)$.¹⁶ (As was noted in the introduction, an example of $r(d)$ is the effect on a judge’s promotion possibilities of the sentences he imposes.) Hence, the adjudicator with discretion makes a decision d to maximize $u(y, d) + r(d)$ rather than to maximize $u(y, d)$.

It should be observed that, because the function r is arbitrary, and can be discontinuous, a possible r is one which would impose a “penalty” if the decision d is outside an interval, where the penalty is large enough so that the adjudicator would never

¹⁶ I do not consider payoff functions r that depend on y (such as demeanor), as it has been assumed that the rule that adjudicators are applying cannot depend on y . I also do not consider payoff functions that depend on w ; see section 6(a).

choose d outside of the interval. Hence, giving the adjudicator a scope of discretion $[a, b]$ is equivalent to giving him complete discretion with an appropriately chosen r .

Let $d(y; r)$ denote the adjudicator's decision given y and the decision-based incentive function $r = r(d)$.¹⁷ Then social welfare when the adjudicator has discretion to choose d , and receives $r(d)$ given his choice of d , is

$$(6) \quad \int_0^{y_m} w(y, d(y; r))f(y)dy;$$

let the best function be denoted r^* . The next result is shown in the appendix.

PROPOSITION 3. (a) It is always desirable to grant adjudicators discretion when decision-based incentives can be employed; social welfare is higher when discretion is given and the optimal decision-based incentive $r^*(d)$ is used than when discretion is not allowed and d^* is prescribed.

(b) When discretion is given and the optimal $r^*(d)$ is employed, the adjudicator's decision must sometimes depend on y ; there exist y_1 and y_2 such that $d(y_1; r^*)$ is unequal to $d(y_2; r^*)$.

(c) When discretion is given and the optimal $r^*(d)$ is employed, social welfare is not generally first-best; for any social welfare function $w(y, d)$, there exists an adjudicator's utility function $u(y, d)$ such that the first-best outcome cannot be achieved under $r^*(d)$.

Part (a) is an important conclusion, as it states that discretion is always desirable to grant given society's the ability to employ a decision-based incentive to implicitly control discretionary deviation. The idea behind the proof of part (a) is as follows. By

¹⁷ For simplicity I assume that this is unique, that the d maximizing $u(y, d) + r(d)$ is unique.

use of an appropriate $r(d)$, the graph of $d(y; r)$ can be made to cross the d^* line. Hence, Proposition 2(b) effectively applies (because the adjudicator's utility function can be interpreted to be $u(y, d) + r(d)$), meaning that a positive scope of discretion is superior to not allowing discretion. But then since a positive scope of discretion can be achieved through use of a properly chosen $r(d)$ (using a penalty as observed above), an $r(d)$ must exist that is superior to not allowing discretion.

Part (b) is a corollary of part (a): Were (b) not true, the decision of the adjudicator would always be the same; yet then social welfare must be no more than social welfare under the fixed decision d^* ; but this would contradict part (a).

With regard to part (c), we would not expect the use of $r(d)$ to permit the first-best outcome generally to be achieved, for r does not depend on y , yet the adjudicator's utility $u(y, d)$ and social welfare $w(y, d)$ do. (It is, however, possible that the first-best outcome can be achieved under an $r(d)$. If $w(y, d) - u(y, d) = g(d)$ for some g , that is, does not depend on y , then clearly if $r(d) = -g(d)$, the first-best outcome will be achieved.)

5. Appeals Process

Another method of controlling the exercise of discretion is to employ the appeals process, whereby disappointed litigants are given the right to have a higher authority examine the adjudicator's decision. To investigate this, assume that adjudicators enjoy full discretion and that a litigant can make an appeal at a cost. Let

$k =$ cost of making an appeal, where $k > 0$,

and suppose that social welfare is reduced by k if there is an appeal in a case. Assume that if an appeal is made, y is ascertained by the appeals authority,¹⁸ and if the

¹⁸ This assumption is apposite in regard to our formal legal system for types of information that appeals courts examine for their proper use by trial courts. The assumption does not fit for types of

adjudicator's decision differed from the socially best decision $d^*(y)$, the decision will be set equal to $d^*(y)$ and a reversal sanction will be imposed on the adjudicator. Let

$s =$ sanction for reversal, where $s > 0$.

Furthermore, suppose that the litigants have opposing interests in the decision, one wanting it to be higher and the other lower. For simplicity, let

$d =$ utility of litigant 1

$-d =$ utility of litigant 2.

The litigants are assumed to observe y , and to know the function $d^*(y)$, so they know whether or not an appeal would succeed. Hence, litigant 1 would make an appeal if $d < d^*(y) - k$, since the latter amount is what litigant 1 would obtain on net if he makes an appeal. Likewise, litigant 2 would make an appeal if $d > d^*(y) + k$. It follows that an appeal would not be made as long as the adjudicator's decision is in the interval $[d^*(y) - k, d^*(y) + k]$.

The adjudicator is assumed to know k and the litigants' utility functions, so the adjudicator can calculate when appeals would be made. The adjudicator will not choose a decision d that would result in an appeal: if an appeal occurs, the adjudicator's utility will be $u(y, d^*(y)) - s$; if the adjudicator were to choose $d^*(y)$ (so that an appeal would not occur), his utility would be $u(y, d^*(y))$; hence the adjudicator must be better off not provoking appeal than if he provokes appeal.

Since the adjudicator will choose d to maximize his utility within the range of decisions that would not lead to appeal, $[d^*(y) - k, d^*(y) + k]$, his optimal decision is as

information that appeals courts do not examine (presumably because of the cost that would entail); appeals courts do not conduct new trials (although they sometimes order a rough equivalent, when they remand a case to a trial court for rehearing).

follows. If his unconstrained decision $d(y)$ is within this interval, he will obviously choose $d(y)$. If $d(y) < d^*(y) - k$, then he will choose $d^*(y) - k$, the lowest d that will not provoke appeal; for $u(y, d)$ is concave in d , implying that a higher d would make the adjudicator worse off. Likewise, if $d(y) > d^*(y) + k$, the adjudicator will choose $d^*(y) + k$.

Observe as well that if the appeals process leads the adjudicator to alter his decision from what it would otherwise be if he enjoys full discretion, then that must increase social welfare, for as just stated, the appeals process can only move the adjudicator's decision closer to $d^*(y)$, and since w is concave in d , that increases social welfare. Moreover, since the appeals process does not result in the actual occurrence of appeals, there are no costs of associated with the appeals process. Hence, if the appeals process changes adjudicators decisions with positive probability, it must increase social welfare. The appeals process will change decisions with positive probability if discretionary deviation, $d^*(y) - d(y)$, exceeds k with positive probability, which is to say, if it ever exceeds k (since $d(y)$ and $d^*(y)$ are continuous).

In summary, we have established

PROPOSITION 4. Suppose that the adjudicator has discretion to make decisions and that the appeals process operates. Then

(a) the adjudicator will choose the personally best decision in the set of decisions that forestalls appeals – the interval $[d^*(y) - k, d^*(y) + k]$ – so that appeals will never in fact occur;

(b) thus, if the adjudicator's unconstrained best decision $d(y)$ lies below the interval that forestalls appeals, he will choose $d^*(y) - k$; if $d(y)$ lies within the interval, he will choose $d(y)$; and if $d(y)$ lies above the interval, he will choose $d^*(y) + k$;

(c) if the adjudicator alters his decision in a case due to the threat of appeal, social welfare will rise, implying that the existence of the appeals process raises social welfare if the discretionary deviation $d^*(y) - d(y)$ exceeds the cost of appeal k for some y ./

6. Concluding Remarks

I comment here on several assumptions made in the analysis and on possible extensions to it.

(a) It was implicitly assumed that the incentive payment to an adjudicator could depend only on his decision d (and included variables), not on the social or organizational payoff $w(d, y)$, such as the consequences for society of having imposed a sentence of ten years on a particular defendant or on the consequences for a college of having failed to admit a particular applicant. The justification for this assumption is that it would be difficult for society or for an organization to trace out the consequences of an adjudicator's decision in a particular case.¹⁹ This assumption was important, for if the social payoff could be observed, then the adjudicator could be better motivated (and the first-best outcome might be achievable in the model studied).²⁰

¹⁹ For example, the social welfare consequences of sentencing a criminal to a term of ten years who had showed a particular degree of remorse would be reflected in such outcomes as the following: whether the criminal would commit more crimes on release, whether the victim felt assuaged by the criminal's statement and behavior in court, and whether friends of the criminal feel the sentence was appropriate. These outcomes would be difficult for society to observe and to use as a basis for rewarding or penalizing a judge (in part because they might take years to eventuate).

²⁰ If w is assumed to be monotonic in y , then the state can achieve the first-best outcome, because the state can determine whether $d^*(y)$ was chosen (and thus it can penalize deviant decisions). In particular, suppose that a decision d_o is observed and that $d_o = d^*(y)$ for some y . Therefore, $y = d^{*-1}(d_o)$

(b) It was also implicitly assumed that the adjudicator did not need to be guaranteed a certain level of expected utility to be willing to carry out his role. If this simplifying assumption were not made and it had been supposed that that the adjudicator's expected utility must equal a reservation level for him to participate in his activity, then discretion would be desirable more often than was true in the analysis. The reason is that giving discretion to an adjudicator raises his expected utility, so permits his wage to be lowered. This wage reduction is thus a benefit of granting discretion in addition to the possible benefit from improved decisions.

(c) Consider the situation when the reason for a variable not being included in a rule is not that it is unverifiable by society, but rather that it is impractically costly for the framers of the rule to provide specifically for many possible outcomes. Recall the example of a rule prohibiting moving vehicles from a park and the question whether an electric-powered bicycle is meant to be covered; this issue might well not have been covered in the rule, even though whether a person used an electric-powered bicycle is quite plausibly verifiable. In such cases, it would make sense for, and we often observe, the use of "standards", meaning principles that adjudicators are supposed to employ as guides in decisionmaking, even though the principles are not precise. For instance, the standard might be that moving vehicles are not supposed to present an "unreasonable danger" to pedestrians in the park. (This standard might help the adjudicator to decide whether or not the electric-powered bicycle should be barred from the park, and it would rather clearly allow him to decide that a battery-powered three-inch model car could be used in the park). A standard appears to be an economical way for framers of a rule to

must hold. Hence, the observed w_o must equal $w(d_o, d^{*-1}(d_o))$. And if w_o does equal this amount, then y must indeed equal $d^{*-1}(d_o)$, for if y were different, w would be different because $w(d, y)$ is monotonic in y .

constrain adjudicators, relative to taking the time and effort to fashion highly detailed rules. Explicit study of standards as a method of control of discretion would seem a worthy avenue of investigation.

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Appendix

Proof of Proposition 2

(a) To show that no discretion might be optimal, suppose that $d(0) > d^*(y_m)$, so that the graph of $d(y)$ lies entirely above the first-best range $[d^*(0), d^*(y_m)]$. Now we know from part (c) (whose proof is independent, so can be relied upon here), that $[a^*, b^*]$ is contained in $[d^*(0), d^*(y_m)]$. It follows that the adjudicator will choose b^* for all y ; his decision will not depend on y . Hence, social welfare can be at most that when d^* is prescribed and no discretion is given. Thus, not giving any discretion and setting the decision at d^* is equivalent, so can be taken to be optimal.

To show that positive discretion might be optimal is obvious, for if $u(y, d) = w(y, d)$ for all d , it is clearly optimal for $[a^*, b^*] = [d^*(0), d^*(y_m)]$.

(b) Consider the case where, as in Figure 3, $d^* < d^*(d^{-1}(d^*))$. To show that positive discretion is desirable, it suffices to show that an interval of the form $[d^*, d^* + \epsilon]$ for some $\epsilon > 0$ results in higher social welfare than prescribing d^* , for that is the best prescribed decision. Now it is clear from Figure 3 that, the adjudicator will choose d^* for all y in $[0, d^{-1}(d^*)]$, and that he will choose d exceeding d^* for greater y , where if ϵ is sufficiently small, his decisions for such y must improve social welfare (due to concavity of w in d) since d is higher but still is below $d^*(y)$. Since the interval $(d^{-1}(d^*), y_m]$ is of positive length, social welfare must be strictly higher, establishing the result for the case in question. A similar argument applies if $d^* \geq d^*(d^{-1}(d^*))$.

(c) Assume otherwise. Replace any limit by $d^*(y_m)$ if it exceeds this, and replace any limit by $d^*(0)$ if it is below this. Note that this means that if $[a^*, b^*]$ lies wholly above $[d^*(0), d^*(y_m)]$, the replaced limits are $[d^*(y_m), d^*(y_m)]$, that is, we are to consider just the point $d^*(y_m)$; and if $[a^*, b^*]$ lies wholly below $[d^*(0), d^*(y_m)]$, the replaced limits are $[d^*(0), d^*(0)]$, that is, we are to consider just the point $d^*(0)$. We claim that, under the replaced limits, any change in decisions must increase social welfare. The replaced limits can only result in the following two types of changes in decisions: a decision d that exceeded $d^*(y_m)$ for some y now becomes $d^*(y_m)$, and this must increase social welfare (due to concavity of w in d); a decision d that would fall below $d^*(0)$ for some y now becomes $d^*(0)$, and this must increase social welfare. Hence, we have shown that $[a^*, b^*]$ can be taken to be in $[d^*(0), d^*(y_m)]$.

(d) Let us show that if $d(y_m) > d^*(y_m)$, then $b^* < d^*(y_m)$. (The proof that if $d(0) < d^*(0)$, then $a^* > d^*(0)$ is essentially the same.) The derivative of (5) with respect to b is

$$(A1) \quad \int_{d^{-1}(b)}^{y_m} w_b(y, b) f(y) dy.$$

If $b = d^*(y_m)$, then $w_b(y, b) = w_b(y, d^*(y_m))$, which is negative for $y < y_m$ (since $d^*(y)$ is increasing in y and w is concave in d) and 0 at y_m . Also, $d^{-1}(d^*(y_m)) < y_m$ given the assumption that $d(y_m) > d^*(y_m)$. Hence, (A1) is negative at $b = d^*(y_m)$, implying that social welfare is raised by lowering b to below $d^*(y_m)$. Q.E.D.

Proof of Proposition 3

(a) Let $r_o(d)$ be a concave differentiable function of d with maximum at d^* (such as $-(d - d^*)^2$). Consider $z(y, d) = u(y, d) + k r_o(d)$, where $k \geq 0$. The function z obeys the assumptions made about the adjudicator's utility function (it is concave in d and the

optimal $d(y)$ is increasing in y).²¹ Also, if k is sufficiently high, the graph of $d(y)$ must cross the d^* line in $(0, y_m)$, since, for any y , the optimal d approaches d^* as k grows large. Hence, if k is high enough, Proposition 2(b) applies to $z(y, d)$, where $z(y, d)$ plays the role of $u(y, d)$ in the proposition. Thus, there is a positive scope of discretion $[a^*, b^*]$, where $a^* < b^*$, such that if the adjudicator maximizes $z(y, d)$ within the interval, but cannot choose a d outside the interval, expected social welfare is higher than if no discretion is allowed. The same outcome can be achieved by allowing discretion generally and through the use of an appropriate r . In particular, let $r_1(d) = -t$ for d outside $[a^*, b^*]$ and $r_1(d) = 0$ for d in $[a^*, b^*]$, where $t > 0$ is a penalty for choosing d outside the $[a^*, b^*]$. Then let $r(d) = kr_o(d) + r_1(d)$, where t is large enough that the adjudicator only chooses d within $[a^*, b^*]$. Under this $r(d)$, by Proposition 2(b), social welfare is higher than if no discretion is allowed (and d^* is the prescribed decision), so social welfare must be higher under $r^*(d)$.

(b) The explanation given for part (b) in the text demonstrates that it is a corollary of part (a).

(c) Consider any two values of y , say $y_1 < y_2$. We will construct a utility function $u(y, d)$ of the adjudicator such that the first-best outcome at y_1 and y_2 cannot be obtained under any r (and thus is not obtained for all y). Suppose that $f(d)$ is a concave function of d with maximum at $d^*(y_1)$, and consider the function $u(y, d) = g(y)f(d - (y - y_2))$, where $g(y)$ is any function that is positive. Note that u is concave in d for any y and that $d(y) = d^*(y_1) + y - y_2$, so that $d(y)$ is increasing in y ; hence u satisfies the assumptions of the

²¹ The sum of concave functions is concave. Also, implicit differentiation of the first-order condition $u_d(y, d) + kr_o'(d) = 0$ with respect to y yields $d'(y) = -u_{dy}(y, d)/[u_{dd}(y, d) + kd''(y)] > 0$ since, by hypothesis $u_{dy}(y, d) > 0$ (because $d(y)$ is assumed to be increasing in y).

model. Now if the first-best outcome is obtained, then when y_1 occurs, $d^*(y_1)$ must be chosen, meaning that $u(y_1, d^*(y_1)) + r(d^*(y_1)) \geq u(y_1, d^*(y_2)) + r(d^*(y_2))$ must hold.

This implies that

$$(A2) \quad r(d^*(y_2)) - r(d^*(y_1)) \leq u(y_1, d^*(y_1)) - u(y_1, d^*(y_2)).$$

Suppose that $u(y, d)$ is such that $u(y_2, d^*(y_1)) - u(y_2, d^*(y_2)) > u(y_1, d^*(y_1)) - u(y_1, d^*(y_2))$. This is possible, since $d(y_2) = d^*(y_1)$, implying that $u(y_2, d^*(y_1)) - u(y_2, d^*(y_2)) = g(y_2)f(d^*(y_1)) - g(y_2)f(d^*(y_2)) = g(y_2)[f(d^*(y_1)) - f(d^*(y_2))] > 0$.²² Then by

(A2), we have

$$(A3) \quad u(y_2, d^*(y_1)) - u(y_2, d^*(y_2)) > r(d^*(y_2)) - r(d^*(y_1)).$$

This, however, implies that $u(y_2, d^*(y_1)) + r(d^*(y_1)) > u(y_2, d^*(y_2)) + r(d^*(y_2))$, which is to say that $d^*(y_1)$ would be chosen over $d^*(y_2)$ when y_2 occurs. Therefore, the first-best outcome cannot be obtained under r . Q.E.D.

²² Since $g(y)$ can be any function of y that is positive, $g(y)$ can be chosen such that $g(y_2)$ is sufficiently large that $g(y_2)[f(d^*(y_1)) - f(d^*(y_2))] > u(y_1, d^*(y_1)) - u(y_1, d^*(y_2)) = g(y_1)[f(d^*(y_1)) - (y_1 - y_2)] - f(d^*(y_2) - (y_1 - y_2))$.