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The effects of remand and bail on efficient sentences

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HIGHLIGHTS

- Comparative static analyses of remand and bail effects on efficient sentences.
- Results depend on jail conditions and costs when prisoners have perfect foresight.
- Results are independent of jail conditions and costs when foresight is poor.

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ABSTRACT

A deterrence model with comparative static analyses is used to study efficient sentences when trials are not immediate. Depending on relative costs and the disutility of jail and prison, as well as the foresight of potential criminals, efficient credit for presentence incarceration ranges from zero to more than one-for-one. Effects on sentences of those on bail is ambiguous.

1. Introduction

Jurisdictions differ widely in sentencing credit for time served in pretrial custody. For example, in California four days of credit is given for every two days of pretrial custody (Couzens and Bigelow, 2013). England and Wales allow one-for-one credit (Criminal Justice Act 2003). Although the American federal system gives one-for-one credit, pretrial detainees do not earn "good time credit", which effectively reduces the benefits (28 CFR 523.17). Some American jurisdictions give judges the option of ordering that a prisoner receive no credit for presentence custody (Holloway v. State 2008 OK CR 14, 182 P.3d 845).

With almost half a million inmates in pretrial custody in the United States alone, understanding the effects of these different practices is clearly important (Heaton et al., forthcoming). Despite this, there appears to have been no previous theoretical analysis of the relationship of bail to efficient sentences in the economics literature.

This letter uses a deterrence model to conduct comparative static exercises to determine efficient responses to delayed sentencing for both remand and bail. It assumes bail decisions are exogenously determined by factors independent of eventual sentences. When potential criminals can predict their bail prospects, it finds that remanded prisoners should receive one-for-one reductions only when both the disutility of jail and the costs to the state are the same as detention in prisons. If conditions in jails are worse than prisons, or if jail costs are higher than prison costs, less than one-for-one credit is efficient. For those on bail, delays in sentencing have ambiguous effects.

This letter then considers the opposite extreme where potential criminals use the proportion of offenders who receive bail as their estimate of bail prospects. Here, it finds that no credit for pretrial detention may be optimal.

2. Analysis

Assume potential criminals receive benefits from crime of β, which is independent of bail prospects. Criminals discount future punishments continuously at rate ρ and are caught with probability p. With probability q, a given criminal is remanded into custody until sentencing, where they incur disutility of D^J. They are sentenced j periods in the future at which time their sentences begin. Those on remand are sentenced to serve s_R periods in prison.

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Those who make bail, are sentenced to serve s_B periods. Prison involves disutility of D^P per period. For simplicity, it is assumed that only the guilty are apprehended and all those apprehended are convicted. The expected utility of crime is given by

$$U = \beta - p\left[q\left(\int_0^j e^{-\rho t}D^J dt + \int_j^{s_R+j} e^{-\rho t}D^P dt\right) + (1-q)\int_j^{s_B+j} e^{-\rho t}D^P dt\right]. \quad (1)$$

Let the cumulative probability distribution function of the benefits offenders receive from the crime be given by F and let $f(\beta) = \frac{dF}{d\beta}$. Let θ_R be equal to the value of β for the marginally deterred individual who knows with certainty he will be remanded if apprehended. Likewise, θ_B is equal to the value of β for the marginally deterred individual who knows with certainty he will be granted bail. Moreover, θ_U is the value of β for uncertain individuals who infer the probability that they will receive bail from the overall proportion of criminals who receive bail. Thus, the partial derivatives of θ_i $(i = R, B, U)$ are the negative of those of U. Although the marginal deterrent effects for both types of criminals who know their bail prospects with certainty are identical when $s_R = s_B$, total deterrence is greater for those on remand, $\theta_R > \theta_B$.

First consider the case of criminals who know with certainty, whether they will get bail. For criminals who know they will not get bail $q = 1$. For criminals who know they will get bail, $q = 0$. Lemma 1 establishes technical results that will be used in Theorem 1.

Lemma 1. (a) *The following hold:*
(i) *if* $D^J = D^P$, *then* $\frac{\partial\theta_R}{\partial s_R} = \frac{\partial\theta_R}{\partial j}$.
(ii) *if* $D^J > D^P$, *then* $\frac{\partial\theta_R}{\partial j} > \frac{\partial\theta_R}{\partial s_R} > 0$.
(b) *The following signs hold:* $\frac{\partial\theta_B}{\partial s_B} > 0$, $\frac{\partial\theta_B}{\partial j} < 0$ *(for* $\rho > 0$*).*
(c) *If* $\rho = 0$, *then* (i) $\frac{\partial\theta_B}{\partial j} = 0$, *and* (ii) $\theta_R = \theta_B$ *when* $s_B = s_R + j$ *and* $D^J = D^P$.

Proof. (a) Differentiating (1) with respect to s_R and j and setting $q = 1$:

$$\frac{\partial U}{\partial s_R} = -pe^{-\rho(s_R+j)}D^P < 0 \quad (2)$$

$$\frac{\partial U}{\partial j} = -p\left(D^J - D^P\right)e^{-\rho j} - pe^{-\rho(s_J+j)}D^P < 0. \quad (3)$$

(i) If $D^J = D^P$, then $\frac{\partial U}{\partial s_R} = \frac{\partial U}{\partial j}$ and $\frac{\partial\theta_R}{\partial s_R} = \frac{\partial\theta_R}{\partial j} > 0$.
(ii) If $D^J > D^P$, then $0 > \frac{\partial U}{\partial s_R} > \frac{\partial U}{\partial j}$ and $\frac{\partial\theta_R}{\partial j} > \frac{\partial\theta_R}{\partial s_R} > 0$.

(b) Differentiating (1) with respect to s_B and j and setting $q = 0$:

$$\frac{\partial U}{\partial s_B} = -pe^{-\rho(s_B+j)}D^P < 0 \quad (4)$$

$$\frac{\partial U}{\partial j} = -pD^P e^{-\rho(s_B+j)} + pD^P e^{-\rho j} > 0 \quad \forall\rho > 0. \quad (5)$$

Thus, $\frac{\partial\theta_B}{\partial s_B} > 0$, and $\frac{\partial\theta_B}{\partial j} < 0$ (for $\rho > 0$)

(c) (i) Evaluating (5) at $\rho = 0$:

$$\frac{\partial U}{\partial j} = -pD^P e^{-\rho(s_B+j)} + pD^P e^{-\rho j} = 0 \quad \forall\ \rho = 0. \quad (6)$$

Thus, $\frac{\partial\theta_B}{\partial j} = 0$

(ii) In this case

$$\theta_R = p\left(s_R + j - 0\right)D^P \quad (7)$$

$$\theta_B = p\left(s_B + j - j\right)D^P. \quad (8)$$

Clearly, $\theta_R = \theta_B$ when $s_B = s_R + j$. □

The costs of a period of incarceration in prison and jail are given by c_P and c_J, respectively. If prisons benefit from economies of scale, $c_P < c_J$.

For simplicity, the state is assumed not to discount the future. As long as it discounts the future at a lower rate than prisoners, this assumption will not affect the qualitative results of the paper. This is likely, given empirical estimates of criminal discount rates of around 0.70 (Mastrobuoni and Rivers, 2015).

For simplicity, it is assumed that criminal utilities do not count in social welfare. Assume the proportion of criminals who are remanded is $\bar{q}$ and the harm from crime is h. Thus, social welfare, when criminals know their bail prospects with certainty are given by

$$W = -\bar{q}\int_{\theta_R}^{\bar{B}}\left\{h + p\left(jc_J + s_R c_P\right)\right\}dF - (1-\bar{q})\int_{\theta_B}^{\bar{B}}\left\{h + ps_B c_P\right\}dF. \quad (9)$$

Theorem 1 characterizes efficient sentences.

Theorem 1. *Assume second order conditions (SOC) hold and criminals know their bail prospects with certainty. The following results characterize efficient outcomes.*

(a) *If offenders do not discount the future (*$\rho = 0$*) and consider prison and remand time perfect substitutes, remand time leads to less (more) total time incarcerated than bail, if incarceration in jails is less (more) costly than prison incarceration.*
(b) *When criminals do discount the future (*$\rho > 0$*), an increase in remand time (*j*), results in a reduction in prison time that*
  (i) *is proportionate when the costs and disutilities of jail and prison are equal,*
  (ii) *is less than proportionate when criminals see prison and remand as perfect substitutes but jail is more costly to the state,*
  (iii) *may be less (more) than proportionate time when the costs of prison and jail are equal but the disutility of jail is greater (less). (A sufficient condition is for* $\rho \geq \frac{1}{s_R+j}$*.)*
(c) *When discount rates are zero, prison time is independent of bail duration. Thus, the total incarceration time established in part (a) for those on remand is also independent of time on bail.*

Proof. (a) The first order conditions for a social welfare maximum are

$$\frac{\partial W}{\partial s_R} = p\bar{q}e^{-\rho(s_R+j)}D^P\left[h + p\left(jc_J + s_R c_P\right)\right]f(\theta_R) - \int_{\theta_R}^{\bar{B}} p\bar{q}c_P dF = 0 \quad (10)$$

$$\frac{\partial W}{\partial s_B} = (1-\bar{q})\,pe^{-\rho(s_B+j)}D^P\left(h + ps_B c_P\right)f(\theta_B) - \int_{\theta_B}^{\bar{B}} p\bar{q}(1-\bar{q})\,c_P dF = 0. \quad (11)$$

Which can be rewritten as

$$e^{-\rho(s_R+j)}D^P\left[h + p\left(jc_J + s_R c_P\right)\right]f(\theta_R) - (1 - F(\theta_R))\,c_P = 0 \quad (12)$$

$$e^{-\rho(s_B+j)}D^P\left(h + ps_B c_P\right)f(\theta_B) - (1 - F(\theta_B))\,c_P = 0. \quad (13)$$

(a) If $c_J = c_P$, and $\rho = 0$, both conditions hold for some value $s_B = s_R + j$. If $c_J > c_P$ ($c_J < c_P$), they hold for some value of $s_B < s_R + j$ ($s_B > s_R + j$).