



# Deterrence and the optimality of rewarding prisoners for good behavior



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## ABSTRACT

In this article I examine the social desirability of rewarding prisoners for good behavior, either by reducing their sentences (granting “time off”), converting part of their sentences to a period of parole, or providing them with privileges in prison. Rewarding good behavior reduces the state’s cost of operating prisons. But rewarding good behavior also tends to lower the deterrence of crime because such rewards diminish the disutility of imprisonment. I demonstrate that, despite this countervailing consideration, it is always socially desirable to reward good behavior with either time off or parole. In essence, this is because the reward can be chosen so that it just offsets the burden borne by prisoners to meet the standard of good behavior – resulting in good behavior essentially without a reduction in deterrence. While employing privileges to reward good behavior might be preferable to no reward, the use of privileges is inferior to time off and parole.

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## 1. Introduction

Controlling the misbehavior of prisoners is a significant challenge in any penal system. Such misbehavior includes using and marketing drugs, assaulting prison employees and other prisoners, and disrupting prison discipline during meals and other activities.<sup>1</sup>

Controlling prisoners is expensive, requiring a significant number of guards and costly physical features of prisons, such as solitary confinement cells. In 2008, approximately \$75 billion was spent

in the United States by federal, state, and local governments on corrections, mostly on incarceration.<sup>2</sup> The cost of controlling badly behaved prisoners is much greater than the cost of controlling well-behaved ones – commonly fifty percent more, and sometimes two or three times more. In Ohio, for example, the average prisoner costs \$63 a day to house, whereas a prisoner in a maximum-security prison costs \$101 a day, and a prisoner in a “supermax” prison costs \$149 a day.<sup>3</sup>

The cost of operating prisons could be reduced if prisoners would behave better, and the prison system provides incentives for prisoners to do so. In particular, good behavior is often rewarded by (i) a sentence reduction, frequently referred to as “time off;” (ii) the partial conversion of a sentence to a period of parole, during which the offender is subject to restrictions and supervision outside of

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<sup>1</sup> Although systematic data on prisoner misbehavior is not widely available, consider the following. In a study of 3000 inmates admitted by the California Department of Corrections in early 1994, 29 percent were subsequently reported for “some kind of serious violation” of prison rules. See [Berk and de Leeuw \(1999, p. 1047\)](#). In a one-year period beginning on March 1, 1997, 25.9 percent of male inmates in the custody of the Federal Bureau of Prisons engaged in some form of misconduct, including 5.1 percent in “violent misconduct,” 5.4 percent in “drug misconduct,” 6.6 percent in “property misconduct,” and 4.8 percent in “security misconduct.” See [Gaes et al. \(2002, pp. 364–366\)](#). Based on a survey of inmates in Federal correctional facilities published in 1991, 15.78 percent of inmates in maximum security prisons were found guilty of prison rule violations for possession of drugs, 9.53 percent for possession of alcohol, 7.66 percent for possession of a weapon, 9.38 percent for assaulting an inmate, and 5.94 percent for assaulting a correction officer. See [Chen and Shapiro \(2007, p. 8, Table 1\)](#).

<sup>2</sup> See [Schmitt et al. \(2010, p. 10\)](#). In 2010, spending by states alone on corrections totaled \$48.5 billion. See [Kyckelhahn \(2012, p. 1\)](#).

<sup>3</sup> See [Mears \(2006, p. 26\)](#). A supermax prison is a super-maximum-security prison. The \$63 figure is the average for prisoners other than supermax prisoners. Mears also observes (pp. 20 and 33) that in Maryland “it costs three times as much to house prisoners in the [supermax prison] as it does to house place [sic] them in a non-supermax facility” and that in Texas it costs 45 percent more to house prisoners in “ad seg” units (administrative segregation units similar in many respects to supermax prisons) than in the general population units. On the costs imposed by the bad behavior of prisoners, see generally [Lovell and Jemelka \(1996\)](#).

prison; or (iii) the provision of in-prison privileges, such as additional television-watching time or greater access to recreational facilities.<sup>4</sup>

In this article I examine the social desirability of rewarding prisoners for good behavior through these three methods. In doing so, I also consider individuals' incentives to commit crimes initially, which will increase, everything else equal, if the disutility of the sanction is reduced as a result of the granting of time off, parole, or privileges. It might appear, therefore, that whether it is desirable to reward prisoners for good behavior depends on whether the resulting savings in prison costs exceed the increased cost of crime.<sup>5</sup>

The main result of my analysis, however, is that it is *always* desirable to reward prisoners for good behavior through either positive time off or a positive period of parole. Why is rewarding prisoners for good behavior through time off or parole unequivocally better than not providing such rewards, given that the rewards lessen the disutility of the sanction and thus tend to increase crime?

Consider the time off policy. To obtain a reward of time off, prisoners must meet some minimum standard of behavior. Satisfying this standard imposes a burden on prisoners — such as from not using drugs or not engaging in violent behavior — and thereby increases the disutility per unit time in prison.<sup>6</sup> The state can choose the amount of time off so as to just offset this increased burden, leaving the total disutility of the sanction (the higher disutility per year for fewer years) unaffected. In other words, a time off policy can be designed so as to maintain deterrence.<sup>7</sup> Thus, a time off policy can provide two benefits to the state without increasing crime: the cost per unit time of imprisoning individuals declines because they behave better; and the length of time they serve declines, further lowering prison costs.

The rationale for parole is similar to that described for time off, though the explanation is more complicated because individuals suffer some disutility while on parole and the state incurs some costs to supervise parolees. Whether parole is superior to time off depends on the magnitudes of these variables. Specifically, which type of reward is preferred depends on the cost of generating a specified level of deterrence by imprisonment compared to the cost of generating that level of deterrence by parole (the latter requiring a longer period of supervision, but one that is cheaper per unit time).

While a privileges policy can be superior to a policy of not rewarding good behavior, the use of privileges is inferior to both time off and parole. Privileges are dominated by the other policies not only because there is no reduction in the time served in prison under a privileges policy, but also because the provision of privileges generally is costly.

<sup>4</sup> Conversely, prisoners can be punished for bad behavior by having their terms extended or losing privileges. See generally Clear et al. (2013, Chapters 13 and 15) and Seiter (2013, Chapters 6 and 10). For some evidence that prisoners behave better in response to the prospect of parole, see Kuziemko (2013); there is no reason to believe that they would not also be responsive to time off and privileges.

<sup>5</sup> Although my focus in this article is on the desirability of rewards when imprisonment is used to deter crime, I also briefly consider the desirability of rewards when imprisonment is used to prevent crime through incapacitation. See comment (b) in Section 7.

<sup>6</sup> My analysis could instead be formulated in terms of discouraging bad behavior in prison rather than encouraging good behavior; then the benefits foregone from not acting badly would correspond to the burden incurred from behaving well. See also note 10.

<sup>7</sup> For example, suppose that the disutility of prison per year is 1000 utils if a prisoner uses drugs and 1200 utils if he does not use drugs. If his original sentence is six years, he would bear 6000 utils of disutility if he uses drugs. If he is offered time off of one year if he does not use drugs, he will also bear 6000 (=5 × 1200) utils of disutility. Obviously, he could be offered a slight amount more than a year of time off to make him affirmatively prefer to not use drugs, with a negligible effect on deterrence.

Although the preceding discussion implicitly assumed that the burden to behave well was the same for all prisoners, the desirability of rewarding prisoners for good behavior holds regardless of heterogeneity among prisoners in this regard. The argument is more complicated because, if individuals differ in the burden to behave well, deterrence cannot be maintained for all of them when they are offered a reward for good behavior. In particular, individuals for whom the burden of behaving well is low — below some threshold — will be deterred less because the benefit to them of the reward will exceed the disutility incurred to obtain it. Nonetheless, for reasons that reflect the intuition already provided, rewarding prisoners for good behavior remains socially beneficial if the magnitude of the reward is chosen optimally.

The main result of this article — that it is desirable to reward prisoners for good behavior through either time off or parole — has not been noted previously. There are two articles that study parole as a mechanism to induce prisoners to behave well, but neither observes this result.<sup>8</sup>

Section 2 presents the basic model employed in the analysis when prisoners are not rewarded for good behavior. Sections 3, 4 and 5 derive the main results regarding the policies of time off, parole, and privileges, respectively. Section 6 reconsiders the analysis when individuals vary in the effort required to behave well. Section 7 concludes with some observations about different types of prisoner misconduct and the incapacitation rationale for imprisonment.

## 2. No reward for good behavior

In this section I describe the model used throughout the analysis, initially assuming that there is no form of reward for good behavior.

Risk-neutral individuals contemplate committing a harmful act in order to obtain a benefit that varies among them. They are assumed to have no wealth, so that the only sanction that can be imposed on them is a prison sentence. Prisoners can choose how much effort to expend to behave well in prison. The more effort that they take to behave well, the lower the state's cost of operating prisons.

Let

$h$  = harm caused if the offense is committed;  $h > 0$ ;  
 $b$  = benefit to an individual from committing the offense;  $b \geq 0$ ;  
 $\nu(b)$  = density of  $b$  among individuals;  $\nu(b) > 0$  for all  $b \geq 0$ ;  
 $p$  = probability of catching an offender;  $p > 0$ ;  
 $s$  = prison sentence for the offense;  $s > 0$ ;  
 $e$  = effort by a prisoner per unit time to behave well;  $e \geq 0$ ;  
 $\bar{e}$  = maximum possible effort; and  
 $c(e)$  = cost to the state per unit time to imprison an individual;  
 $c'(e) < 0$ ;  $c''(e) \geq 0$ .

Sentences are measured in units of time corresponding to one dollar of disutility.<sup>9</sup> I assume that there is an upper bound on prisoner effort to behave well in order to obtain determinate solutions under the time off and parole policies (see Propositions 2 and 4).<sup>10</sup>

<sup>8</sup> See Miceli (1994) and Garoupa (1996). Their assumptions also differ significantly from mine. Notably, Miceli does not include in social welfare the disutility of individuals from being imprisoned or from their effort to behave well; and Garoupa assumes that the total effort required to comply with prison rules and regulations is independent of the length of the sentence and that good behavior in prison does not affect the public cost of imprisonment per unit time. See also note 23 and accompanying text.

<sup>9</sup> Implicit in this construction is that the disutility of a sentence is proportional to its length.

<sup>10</sup> The need to make this assumption could be avoided if the model were reformulated in terms of prisoners obtaining a benefit from acting badly (for example,

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