

Letter

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Inmate Assistance Programs

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Abstract: This paper analyzes the deterrence implications of different inmate assistance programs (IAPs), carefully distinguishing between deterrence of first offenses and recidivism. All IAPs considered in our model reduce recidivism, and we identify IAPs that also reduce the first offense rate. However, IAPs which increase work opportunities, improve the reintegration of exiting inmates, and moderate individual's self-control issues may lower the deterrence of first offenses, if this possibility is not adequately anticipated when designing these IAPs.

Keywords: crime; deterrence; inmate assistance programs; rehabilitation

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1 Introduction

Since Becker's seminal work on crime and punishment (Becker 1968), scholars have studied different policies through which crime could be reduced. Most of this literature understandably focuses on enforcement and punishment to achieve deterrence. Only a few contributions to this literature explore the effects of incapacitation and rehabilitation (e.g. Bernhardt, Mongrain, and Roberts 2012; Ehrlich 1981; Meier 2001; Miceli 2010; Shavell 1987). However, there have been some recent attempts to ascertain whether rewards, rehabilitation, and inmate assistance programs (IAPs) may also be effective tools in reducing crime.¹

¹ See, e.g., Galle (2020) and Mungan (2021) and the sources cited therein.

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IAPs range from providing education to inmates in prison to offering them assistance upon exiting prison to ease their transition to life outside of prison.² These programs may appear contrary to the goal of crime reduction based on an insight from earlier scholarship on the subject: they reduce the expected costs associated with committing crime and thereby dilute the deterrence of offenses that cause people to be imprisoned in the first place (Ehrlich 1981 p. 315). However, as noted in more recent literature, these programs also have the potential to reduce recidivism.³ Thus, intuitively, these programs may give rise to a trade-off between the deterrence of offenses before incarceration and a reduction in recidivism, and therefore their aggregate impact of crime is, *a priori*, ambiguous.⁴

In this paper, we add to informal accounts of the more nuanced potential impacts of IAPs (Aslim, Lu, and Mungan 2024a) by considering a simple crime-and-deterrence model incorporating four realistic considerations with which IAPs may interact. We consider people (i) whose work opportunities influence their opportunity costs from crime, (ii) who may experience difficulties in navigating life outside prison upon release, (iii) who may exhibit impulsivity problems, and (iv) whose intrinsic attitudes toward crime may be influenced by their experiences. We focus on IAPs, which may positively influence each of these factors but impose costs on the participant. More specifically, we consider (i) labor training, (ii) re-integration, (iii) temperament and decision-making, and (iv) social studies programs. All IAPs analyzed in our model reduce recidivism. In addition, IAPs that focus on the last consideration also raise the deterrence of first offenses and, therefore, have an unambiguous crime-reducing effect. On the other hand, the first-offense-rate effect of IAPs that focus on increasing exiting inmates' work opportunities and easing their reintegration or self-control issues is ambiguous: The direction of this effect depends on how the IAP recipient's *ex ante* perceived benefits and costs compare. Thus, we discuss the possibility of altering the relative costs of these programs to IAP recipients, similarly to costs of the mandatory work program considered in Polinsky (2017) or the burden to meet the standard of good behavior in Polinsky (2015), to ensure that they reduce overall crime.

2 See Aslim, Lu, and Mungan (2024a) for a more detailed discussion of these programs.

3 For instance, Galbiati, Ouss, and Philippe (2021) provide evidence on the profound impact of policies promoting access to information about employment opportunities on recidivism, and Bhuller et al. (Forthcoming) provide evidence that receiving a sentence can improve mental health outcomes. Relatedly, Aslim et al. (2023, 2024c) show that public health insurance provision is associated with a reduction in the re-imprisonment of people who were previously convicted for violent crimes and public order violations. See, Aslim, Lu, and Mungan (2024b) for a lengthier review.

4 These effects are reminiscent of those that emerge in discussions of policy tools that can be used to affect the stigma from crime, e.g., Funk (2004) and Mungan (2017).

Our findings suggest that carefully designed IAPs may have the potential to reduce recidivism and crime more generally. However, we refrain from engaging in a broader welfare analysis as the welfare impact of these programs will depend on their implementation costs as well as their benefits apart from crime reduction (e.g. increased productivity in the labor market). In the next two sections, we present our model to formalize the points above and the analysis thereof. Afterward, we provide brief concluding remarks.

2 Model

To reflect impulsivity, we consider individuals with (β, δ) -preferences (e.g. O'Donoghue and Rabin 1999), implying that preferences from the perspective of period t can be represented by

$$U^t = u_t + \beta \sum_{\tau=t+1}^T \delta^\tau u_\tau$$

with u_t as payoffs in period t , δ as the standard discount factor, and β representing present bias. We assume that δ equals one while β is less than one, to focus on the role of present bias (as in O'Donoghue and Rabin 1999). It is important to note that the assumption $\beta < 1 = \delta$ implies that only the distinction between present and future payoffs is relevant, whereas payoffs at different future points in time are not treated differently in terms of discounting. Present bias and self-control problems are often treated interchangeably (e.g. DellaVigna 2009), and self-control problems are an essential element in the *General Theory of Crime* as introduced by Gottfredson and Hirschi (1990).

Agents with (β, δ) -preferences can be considered a collection of “different selves”, each with different preferences. For the impact of present bias on decision-making, it is critical to specify what selves know about the preferences of later selves. We consider both cases where potential offenders are naive as well as where they are sophisticated. When potential offenders are naive, they acknowledge the role of present bias in the present period but expect not to be subject to present bias in future decision-making problems. When potential offenders are sophisticated, the self in period t knows that his as well as the future selves' decision-making is influenced by present bias (e.g. Friehe and Miceli 2023; Friehe, Rössler, and Dong 2020; O'Donoghue and Rabin 1999). IAPs can improve self-control, which we operationalize by letting $\hat{\beta} \geq \beta$ capture IAP recipients' present bias as opposed to β which captures their pre-IAP present bias. Naive potential offenders do not anticipate distortions in their future decisions caused by present bias and, therefore, ignore IAP impacts on present bias, while sophisticated potential offenders anticipate these.

In our model, we consider two periods involving decision-making. Both periods offer potential offenders a criminal opportunity at a gross benefit of b . When a legal opportunity is available, its payoff g is drawn according to the cumulative distribution denoted $V(g)$, with density $V'(g) = v(g)$. To capture the existing impacts of criminal involvement on legal work opportunities, we assume that a person without a criminal past always has legal work opportunities, and criminal involvement reduces the odds of having these opportunities to $\ell_1 < 1$. IAPs focusing on restoring the employability of inmates can increase this probability to $\ell \geq \ell_1$, i.e. reduce existing employability problems caused by criminal records and human capital depreciation.

Similarly, individuals with a previous criminal conviction experience a difficult post-release period in which their propensities to commit crime may be increased, due to reintegration problems as well as peer pressure from networks established while in prison. This post-release period is represented by a probability $q(\gamma)$ with which an exiting inmate commits crime without having an opportunity of social reintegration. IAPs can ease re-integration by shortening the transitory period of the exiting inmate, which is operationalized by $q' < 0$ where γ proxies the inverse of the duration of the transitory period. Shortening the transitory period also reduces the reintegration effort cost $c(\gamma)$ that an ex-convict who does not undertake the criminal act in the post-release period incurs, with $c' < 0$.

IAPs may also educate convicts about civic duties, for example, and thereby instill a preference for norm compliance such that recidivism would reduce the benefits from crime by an intrinsic cost of m (e.g. Kaplow and Shavell 2007).⁵

The precise timing of the setup is as follows: In the beginning of Stage 1, potential offenders choose whether to undertake crime. If detected, the offender is sanctioned by s and subjected to an IAP at a cost R at the end of Stage 1. At the beginning of Stage 1, the payoffs created at the end of Stage 1 lie in the future. Any offender is detected with probability p . In Stage 2, individuals without a conviction choose between crime and legal employment (if available). In contrast, convicts first pass through a post-release period without a legal employment opportunity. Any offenses conducted in Stage 2 will be punished in Stage 3, if detected.

In what follows our objective is to assess the impact of altering an IAP to marginally change $\hat{\beta}$, ℓ , γ and m , respectively, while holding all other aspects of the IAP constant. We denote the personal cost to the inmate from participating in the IAP as $\mathcal{R}$. Because our objective is to isolate the impact of IAPs, we assume that sanctions and detection probabilities – denoted by s and p – do not change after a conviction or across periods to simplify the analysis.

⁵ In their experimental study, Balafoutas et al. (2020) randomly asked inmates simply to reflect on their incarceration and show that this intervention increased the inmates' social aptitudes.

3 Analysis

We first consider potential offenders' criminal decisions and then turn to their implications for crime rates.

3.1 Decision Making

We proceed by backward induction, and begin our analysis with the second period.

3.1.1 Second Period

A person enters the second period with one of three first-period histories: *No First-Period Crime (NC)*, *Undetected First-Period Crime (ND)*, and *Detected First-Period Crime (D)*.

A person's second period expected utility when he has history *NC* is

$$\beta U_{2,NC} = \beta \left(\int_{b-\tilde{\beta}ps}^{\infty} g\nu(g)dg + V(b - \tilde{\beta}ps)(b - ps) \right), \quad (1)$$

where

$$\tilde{\beta} = \begin{cases} \beta & \text{if agent is sophisticated} \\ 1 & \text{if agent is naive} \end{cases} \quad (2)$$

The person engages in the legal act when its payoff exceeds the net payoff from crime. The person anticipates that the expected sanction will be discounted by β when deciding whether to commit crime, but only if he is sophisticated. The expression $\tilde{\beta}$ captures this dependence on the offender's sophistication. All payoffs lie in the future and are thus discounted by β at the start of period 2. $\tilde{\beta}$ enters (1) as an aspect that is relevant to how decisions will be made in Stage 2 but not as an aspect relevant to the evaluation of Stage-2 payoffs.

The expected utility in scenario *ND* is

$$\beta U_{2,ND} = \beta \left(\ell_1 \int_{b-\tilde{\beta}ps}^{\infty} g\nu(g)dg + P(b - \tilde{\beta}ps, \ell_1)(b - ps) \right), \quad (3)$$

where

$$P(b - \tilde{\beta}ps, \ell_1) = \ell_1 V(b - \tilde{\beta}ps) + (1 - \ell_1) \quad (4)$$

is the probability of engaging in crime in period 2: A work opportunity arrives with probability ℓ_1 but it is more attractive than the criminal opportunity for the self making the choice about crime only with probability $1 - V(b - \tilde{\beta}ps)$.

A person's second period expected utility when he has history D is

$$\hat{\beta}U_{2,D} = \hat{\beta}(q(\gamma)u_T + (1 - q(\gamma))u_R). \quad (5)$$

where $\hat{\beta} \geq \beta$ represents the (weakly) improved self-control of the ex-convict; $q(\gamma)$ is the probability with which the person commits a crime in a transitory state which yields expected utility u_T ; and with the remaining probability $1 - q(\gamma)$ the ex-convict makes a decision after reintegration and receives expected utility u_R . The expected utility is

$$u_T = b - m - ps. \quad (6)$$

in the former state and

$$u_R = \ell \int_{b-m-\tilde{\beta}ps}^{\infty} g v(g) dg + P(b - m - \tilde{\beta}ps, \ell)(b - m - ps) - c(\gamma). \quad (7)$$

in the latter state, where

$$\tilde{\beta} = \begin{cases} \hat{\beta} & \text{if agent is sophisticated} \\ 1 & \text{if agent is naive} \end{cases}. \quad (8)$$

The sophisticated potential offender understands that the crime choice will be influenced by present bias and anticipates the benefit from the IAP (i.e. that $\hat{\beta}$ instead of $\beta \leq \hat{\beta}$ applies). In contrast, the naive potential offender does not expect present bias to bear on the choice between crime and legal employment. Note that we assume that the moral cost is incurred when the crime is committed whereas the expected sanction is relevant only in Stage 3 and therefore discounted by the self making the choice about crime.

3.1.2 First Period

At the start of the first period, planning not to commit crime in period 1 yields an expected utility

$$U_{1,NC} = g_1 + \beta U_{2,NC} \quad (9)$$

In contrast, planning to commit a crime in period 1 generates an expected utility

$$U_{1,C} = b + \beta(p[U_{2,D} - (s + \mathcal{R})] + (1 - p)U_{2,ND}) \quad (10)$$

where $\mathcal{R}$ represents the disutility the IAP imposes on the ex-convict, which is increasing in the intensity of the IAP program.

These expressions highlight the fact that people consider the negative impacts beyond the formal punishment (e.g. reduced employability) as expected costs associated with committing offenses. Taking these into consideration, they decide whether to commit an offense. In particular, comparison of payoffs yields the following threshold:

$$g_1^* = b + \beta((p(U_{2,D} - (s + \mathcal{R})) + (1 - p)U_{2,ND} - U_{2,NC})). \quad (11)$$

Thus, we can state the crime rate in period 1 as

$$C_1 = V(g_1^*). \quad (12)$$

3.2 Crime Rates

Considering the two periods of our setup, the total crime rate is

$$C = C_1 + C_2,$$

with

$$C_2 = C_1(pC_{2,D} + (1 - p)C_{2,ND}) + (1 - C_1)C_{2,NC}$$

where $C_{2,D}$ ($C_{2,ND}$) and $C_{2,NC}$ denotes the second-period crime rate among individuals (not) convicted for their crime in period 1 and individuals without previous criminal involvement.

Thus, the impact of an IAP which marginally changes θ , for $\theta = m, \ell, \gamma, \hat{\beta}$, is

$$\frac{\partial C}{\partial \theta} = \frac{\partial C_1}{\partial \theta}(1 + pC_{2,D} + (1 - p)C_{2,ND} - C_{2,NC}) + \frac{\partial C_{2,D}}{\partial \theta}pC_1. \quad (13)$$

Here, $\partial C_1 / \partial \theta$ captures the impact on the first period crime rate, which can be interpreted as the general deterrence effect of the policy through θ . On the other hand, $\partial C_{2,D} / \partial \theta$ captures changes in recidivism. Thus, it is worth noting that the first term captures effects on the entire population, whereas the second effect is limited to impacts on people who have previously been convicted, a smaller population. In cases where these two effects do not oppose each other, this observation is not important for ascertaining the sign of the overall effect on crime. However, in cases where these two effects go in opposite directions, it may be important to keep in mind this relative size difference. To give an example, in the USA, the share of individuals with a prior criminal conviction is about one third (NCSL 2023).

Note that $C_{2,NC} = V(b - \beta ps)$ and $C_{2,ND} = \ell_1 V(b - \beta ps) + (1 - \ell_1)$ are not influenced by IAPs, and that

$$C_{2,D} = q(\gamma) + (1 - q(\gamma))P(b - m - \hat{\beta} ps, \ell) \quad (14)$$

Thus, the IAP's effect on crimes committed by ex-convicts is

$$\frac{\partial C_{2,D}}{\partial m} = -(1 - q(\gamma))\ell v(b - m - \hat{\beta}ps) < 0 \quad (15)$$

$$\frac{\partial C_{2,D}}{\partial \ell} = -(1 - V(b - m - \hat{\beta}ps)) < 0 \quad (16)$$

$$\frac{\partial C_{2,D}}{\partial \gamma} = q'(\gamma)\ell(1 - V(b - m - \hat{\beta}ps)) < 0 \quad (17)$$

$$\frac{\partial C_{2,D}}{\partial \hat{\beta}} = -(1 - q(\gamma))\ell ps v(b - m - \hat{\beta}ps) < 0. \quad (18)$$

We summarize:

Proposition 1. *Recidivism decreases with greater use of IAPs.*

The different aspects influence the decision to undertake another criminal offense differently. For example, the labor-market opportunity aspect of IAP makes it more likely that the individual receives an attractive legal employment offer, whereas the moral cost makes the individual less demanding regarding the payoff of a legal employment option. However, all aspects make another offense less likely.

Next, we investigate the effect of IAPs on the crime rate in the first period, C_1 . This effect hinges on how the program influences the critical threshold g_1^* , or, more concretely, the term $\Delta = U_{2,D} - \mathcal{R}$ (because other terms in the critical gain level do not respond to the use of IAPs as revealed by (11)).

First-period deterrence increases with the IAP's use if Δ decreases. We find

$$\frac{\partial \Delta}{\partial m} = -\left(q + (1 - q)P(b - m - \tilde{\beta}ps, t)\right) - \frac{\partial \mathcal{R}}{\partial m} < 0 \quad (19)$$

$$\frac{\partial \Delta}{\partial \ell} = (1 - q)(1 - V(b - m - \tilde{\beta}ps))\left(E[g|g \geq b - m - \tilde{\beta}ps] - (b - m - \tilde{\beta}ps)\right) - \frac{\partial \mathcal{R}}{\partial \ell} \quad (20)$$

$$\frac{\partial \Delta}{\partial \gamma} = -q'(\gamma)(u_R - u_T) - (1 - q(\gamma))c'(\gamma) - \frac{\partial \mathcal{R}}{\partial \gamma} \quad (21)$$

as marginal effects.

The marginal effect of the impulsivity program is

$$\frac{\partial \Delta}{\partial \hat{\beta}} = -\frac{\partial \mathcal{R}}{\partial \hat{\beta}} < 0 \quad (22)$$

for naive offenders and

$$\frac{\partial \Delta}{\partial \hat{\beta}} = (1 - q)p^2 s^2 \ell (1 - \hat{\beta})v(b - m - \hat{\beta}ps) - \frac{\partial \mathcal{R}}{\partial \hat{\beta}} \quad (23)$$

for sophisticated offenders. The self at the beginning of the first stage does not discount the future payoffs b and p_s differently. However, the deciding self in the second period will discount the expected sanction, and thus excessively engage in crime from the standpoint of the self at the beginning of Stage 1. This means that the sophisticated potential offender will anticipate a benefit from the higher $\hat{\beta}$ arising from the IAP.

We summarize:

Proposition 2. (a) *First-period deterrence increases with (i) programs that introduce an intrinsic preference for norm compliance, and (ii) programs that address self-control issues when potential offenders are naive. (b) Programs that improve work opportunities or shorten the transitory period after release may increase or decrease first-period deterrence. The same holds for self-control programs when potential offenders are sophisticated about their self-control issues. (c) When IAP participation costs $\mathcal{R}$ can be chosen by the policymaker, IAPs can always be designed to reduce not only recidivism but also the aggregate crime rate.*

Claims (a) and (b) follow from the above mentioned derivatives. A program that introduces an intrinsic preference for norm compliance reduces the payoffs the individual can obtain from crime. Thus, there is no potential for a weakening of deterrence in the first period. Similarly, naive offenders anticipate only a higher total penalty after a detection (as $\mathcal{R}$ has been increased) without noticing any other implication from the change of the IAP. This is different for a sophisticated individual who anticipates that the effect of the IAP will help with making better future decisions between legal employment and crime. Accordingly, in such cases, deterrence implications hinge on the relative importance of marginal benefits and marginal costs. Claim (c) highlights that it may be possible to offset any benefits anticipated from program participation by adequately adjusting participation costs, e.g. by adjusting $\mathcal{R}$ such that the impact of the IAP on $U_{2,D}$ is either negligible or no larger than the participation cost. This is reminiscent of the in-prison work programs proposed by Polinsky (2017), which increase the costs of being imprisoned. Thus, if IAPs that impact ℓ and γ have the potential of increasing crime, combining them with work programs to reduce their net benefits can potentially overturn this result.

4 Discussion and Conclusion

People often oppose providing inmates with opportunities that may benefit them in the future, such as special training programs. Concerns about adverse deterrence

effects can cause such opposition. In this note, using a simple dynamic model, we highlight the deterrence and recidivism effects of very different inmate assistance programs. Our analysis suggests that some programs can improve the deterrence of first-offenses and lower recidivism, too. For other programs, a careful program design may be needed to curb concerns about adverse deterrence effects.

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