The Effect of Mandatory Minimum Punishments on the Efficiency of Criminal Justice Resource Allocation

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Abstract

Over the past three decades, mandatory minimum sentences have proliferated through state and federal sentencing regimes. These sentencing practices mandate minimum prison terms for specific offenses with little flexibility afforded to judges and parole boards in impacting effective sentence lengths following a case's disposition. Mandatory minimums may either enhance or diminish the efficiency with which the criminal justice system incapacitates the criminal active. To the extent that such laws respond to actual shortcomings in sentencing practices, mandatory minimums may be effectively identifying and removing from society individual with a high propensity to offend. On the other hand, if mandatory minimum are driven by political competition or faulty inference drawn from highly salient events, the one-size-fits-all sentencing policy may results in the over-incarceration of relatively less active offenders and perhaps displace more active offenders from scarce institutional resources in the process. In this project, we study the special case of the internal inmate security placement process in California prisons to illustrate these tradeoffs. California's inmate assignment process makes use of mandatory minimum security placements to higher security prisons for inmates with specific offense and sentencing characteristics. Higher security prisons are considerably more restrictive and incapacitate inmates to a greater degree than lower security prisons. We model the optimal choice of prison authorities wishing to minimize the expected value of institutional misconduct subject to a resource constraint on the number of high security beds. We generate theoretical predictions regarding the relationship between observed institutional misconduct rates and security classifications based on formal risk scores and mandatory minimums under the null hypothesis that mandatory minimums yield the first-best choice, and under the weaker hypothesis that the use of mandatory minimum enhances efficiency. We test these predictions with microdata on inmate security assessment and observed institutional misconduct. Our analysis concludes that mandatory minimums consistently have an adverse effect on the efficiency of correctional resource allocation.

1. Introduction

Over the past three decades, mandatory minimum sentences have proliferated through state and federal sentencing regimes. Mandatory sentencing laws specify minimum prison sentences for specific offenses or offenses with aggravating circumstances that are targeted by legislation. Between 1975 and 2002, every state adopted some form of mandatory minimum sentencing with nearly three-quarters of all states enacting mandatory minimum sentences for possession or trafficking of illegal drugs (Stemen et. al. 2006). Mandatory minimum penalties are also often encountered for violent offenses, offenses involving weapons, carjacking, offenses victimizing minors, and offenses committed in close proximity to schools. Federal law is riddled with mandatory minimum sentences.

Whether mandatory minimum sentences are effective in controlling crime depends on the general deterrence and incapacitation effects that they induce. To the extent that severe and certain sentences have large general deterrent effects, severe sentencing might in theory reduce both crime and incarceration rates. However, the empirical literature evaluating the effects of sentence enhancements on criminal offending tends to find relatively modest general deterrence effects, especially for stiff enhancements to crimes that would have already been punished with a prison sentence.

With regard to incapacitation, the effect of mandatory minimums may either enhance or diminish the efficiency of the use of prison beds. Targeted sentencing legislation may effectively identify weaknesses in local sentencing practices that lead to systematic tendencies to under-incarcerate particularly dangerous people. Alternatively, the one-size-fits-all nature of mandatory minimum sentences constrains the ability of judges and parole boards to differentiate when deciding sentence length at the front end and to individualize the release decision at the back end of a prison term. In the face of criminogenic heterogeneity among individuals convicted of a targeted offense, mandatory minimums may results in the over-incarceration of relatively less active offenders and perhaps the displacement of more active offenders from scarce institutional resources.

In this paper, we present a case study of the use of mandatory minimums to assess whether they enhance or diminish the efficiency with which scarce criminal justice resources are used to control crime rates. We focus explicitly on the question of whether mandatory minimums maximize incapacitation subject to a given resource constraint. We essentially explore whether a change in the rationing scheme used to allocate scarce high-security prison beds would lead to an increase or a decrease in total incapacitated crimes. Evaluating this question is akin to assessing whether it would be possible to reduce crime by swapping the punishments of a confined inmate with a mandatory minimum sentence and a convicted offender who receives a lesser sentence as a result of the displacement caused by mandatory sentencing practices.

To address this question, we study the special case of the internal inmate security classification process in California prisons. California's inmate assignment process makes use of mandatory minimum security placements to higher security prisons for inmates with specific offense and sentencing characteristics. Higher security prisons are considerably more restrictive and incapacitate inmates to a greater degree than lower security prisons. We model the optimal choice of prison authorities wishing to minimize the expected value of institutional misconduct subject to a resource constraint on the number of high security beds. We generate theoretical predictions regarding the relationship between observed institutional misconduct rates and security classifications based on formal risk scores and mandatory minimums under the null hypothesis that mandatory minimums yield the first-best choice, and under the weaker hypothesis that the use of mandatory minimum enhances efficiency. We test these predictions with microdata on inmate security assessment and observed institutional misconduct. Our analysis concludes that based on incapacitation effects alone, the use of mandatory minimums reduces the efficiency of the deployment of criminal justice resources.

2. A model of optimal security placement subject to mandatory minimums

Mandatory minimum sentences have contributed greatly to growth in the U.S. prison population by increasing time served among those sent to prison, as well as by increasing the likelihood of being sent to prison conditional on being convicted for a specific offense (Raphael and Stoll 2013). Moreover, the proliferation of mandatory minimum sentences has coincided with decreases in estimates of the effectiveness of prison as a crime control tool (Liedke, Piehl and Useem 2006; Johnson and Raphael 2012). A dissection of the avenues through which sentencing policy impacts crime is suggestive of a potential causal link between these two trends.

The use of prison as punishment, and by extension mandatory minimum sentences, may impact crime through several channels. First, the likelihood and severity of punishment may deter individuals from committing crime in the first place. Becker's (1968) seminal model of criminal activity supposes a rational offender who compares the expected utility of committing crime to the utility of abiding by the law. The model yields the straightforward conclusion that enhancing punishment severity (either through increasing the likelihood of being caught or the severity of punishment) should reduce crime through general deterrence. Polinksy and Shavell (1999) as well as Lee and McCrary (2009) introduce alternative time preference structures to this basic theoretical framework to analytically assess the general deterrence effects of lengthy sentences versus an enhanced probability of being caught. These models naturally yield the conclusion that the behavior of present-oriented offenders tends to be unresponsive to changes to the intensive margin of punishment, as the additional punishment tends to occur in the future.[1]

[1] These enhancements to the basic economic model of crime accord with criminological research emphasizing the importance of impulsivity, visceral stimulation, and other contributors to an extreme present-orientation in understanding criminal activity (Nagin and Pogarsky 2003).

Evidence of general deterrence is stronger for policies that target very specific offenders who know about the enhanced penalties that they face. For example, Helland and Tabarrok (2007) find significant declines in re-arrest among released prison inmates who face sentence enhancement under various repeat offender laws, though the effects are modest relative to the high re-offending base rate. Drago, Galbiati and Vertova (2009) find that Italian prison inmates released via the 2006 collective clemency who faced the addition of their unserved time to any new sentences they may receive tended to recidivate at lower rates. The evidence of a more general response to sentence enhancements or even other dimensions of sentencing severity is less supportive of general deterrence. For example, there is little evidence of a discontinuity in offending at age 18 despite the increase in sentence severity and the widespread knowledge of this change that comes with passing the age of majority (Lee and McCrary 2009, Hjalmarsson 2009). In addition, there is little evidence that the death penalty deters violence (Chalfin et. al. 2013, Donohue and Wolfers 2005, 2009).[2]

Beyond general deterrence, prison may also reduce crime through incapacitation. An incarcerated person cannot commit crime in non-institutionalized society, although they can certainly commit crime within prison facilities. Existing empirical literature finds great heterogeneity in these incapacitation effects. Research conducted in the U.S. during the 1970s and 1980s (see Spelman 1994) as well as more recent research in low-incarceration rate settings (Buonanno and Raphael 2013; Barbarino and Mastorbuoni 2014, Vollaard 2012) tends to find relatively large incapacitation effects. U.S.-based research conducted during more recent time periods with high incarceration settings tends to find very small incapacitation effects (Owens 2009, Lofstrom and Raphael 2015).

Mandatory minimums limit the ability of criminal justice actors beyond the prosecutor to individualize sentencing, a fact that may ultimately impact the average incapacitation effect associated with prison sentences. In the absence of a mandatory minimum, this individualization may occur at the

[2] For a thorough review of the empirical and theoretical research on deterrence see Chalfin and McCrary (2014).

front end (longer sentences handed down by a judge to offenders that appear to be particularly dangerous) or the backend (parole boards using their release discretion to selectively incapacitate) of the process determining actual length of stay in prison. In the face of a mandatory minimum, the process treats all offenders convicted of similar offenses the same, regardless of whatever criminogenic heterogeneity exists among individuals convicted of the same offense.

Constraining the discretion of judges and parole boards may either enhance or reduce the amount of incapacitation achieved within a given prison resource constraint. To the extent that judges and parole boards are poor at discriminating between high and low risk offenders, the constraints imposed by mandatory minimum sentences may be justified. In this case, the legislative process leading to the passage of a mandatory minimum (perhaps through the avenue of constituents voicing concerns about particular types of offenders to their elected representatives), may be effective at identifying high risk offenders that need to be removed from society. Alternatively, it may be the case that judges and parole boards have more detailed information as well as experience regarding recidivism risk, and constraining length of stay through a mandatory minimum effectively discards this information. Moreover in the face of a resource constraint, forcing the system to incarcerate a relatively low risk offender for a lengthy period of time must necessarily displace someone else, or create pressure to displace someone else through early release or diversion to non-incarceration alternatives at sentencing.[3]

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[3] Kuziemko (2013) presents evidence suggesting that sentencing constraints may reduce the efficiency of prison bed use. Using administrative data on prison releases and recidivism in the state of Georgia, Kuziemko explores the impact of truth-in-sentencing constraints (state laws that require inmates to serve a pre-determined minimum percentage of their sentence) on recidivism outcomes and the parole board release process. The author finds the following. First, recidivism risk declines with time in prison, likely due to the aging of the inmate and the well-documented fact that the propensity to offend declines sharply with age. Second, parole boards are quite good at distinguishing high-risk from low-risk inmates based on observation while incarcerated and on information that extends beyond one's age, demographics, and criminal history upon entering prison. In particular, among inmates that are released under the discretion of the parole board, observable characteristics explain less of the variation in recidivism outcomes relative to the amount explained among inmates released following compliance with a truth-in-sentencing mandate. This suggests that the Georgia parole board makes effective use of available risk factors in their release process when afforded the discretion to do so. Third, when discretion is wrested from

In this paper we explore the effects of mandatory minimums on the efficiency of the use of prison resources within a single prison system. The stringency of incarceration (housed in a cell or a dormitory, ability to work, ability to move outside of an electrified fence, time out of cell, time with others etc.), varies greatly within state prison systems. In fact, one may conceive of the conditions of confinement of prisoners as representing the rightward range along a continuum of the restrictiveness associated with one's sentence, with community corrections punishments such as probation and parole representing the least restrictive, followed by low-security prison facilities, and perhaps bound from above by secure housing units (often referred to as solitary confinement). The prison system we study employs mandatory minimum triggers in placing inmates in higher security facilities, paralleling sentencing systems that use triggering offense characteristics to qualify inmates for mandatory prison terms. Most useful for our purposes, we can observe official misconduct for inmates across security levels, a fact that will facilitate tests of the efficiency of resource allocation.

We begin by developing a simple model of the optimization problem faced by the security placement manager of a prison system. This manager seeks to minimize institutional misconduct (for example, assaults on other inmates or staff or less serious forms of rules violation such as trafficking or possession of contraband) by strategically assigning inmates to facilities that differ in terms of the stringency of confinement. The prison authority observes a noisy composite risk signal of future offending while incarcerated and can proportionally reduce misconduct through a high security placement. The high security institution imposes greater restrictions on internal movements and other liberties (for example, unstructured time out of cell, the amount of people on the yard at any given time,

parole boards via truth-in-sentencing type practices, inmates engage in more institutional misconduct, are less likely to participate in rehabilitative programming, and are more likely to recidivate upon release. Through a series of back-of-the-envelope calculations, Kuziemko concludes that restricting the discretion of parole boards both increases the incarceration rate through longer sentences and increase crime through higher recidivism rates among those with little incentive to rehabilitate while incarcerated.

celled housing verses dorm housing), and thus incapacitates inmates to a greater degree than the low security institution.

We first derive the optimal inmate assignment choice when the only information is the continuous risk signal. We then introduce mandatory minimum overrides that constrain the assignment choice by requiring that all inmates with specific characteristics be assigned to high security beds. Our goal in this section is twofold. First, we wish to assess the conditions under which such an override would yield the efficient allocation of inmates across security levels as well as the weaker set of conditions under which such a rule would be efficiency enhancing. Second, we aim to generate empirically testable predictions that we can then take to administrative placement and institutional misconduct data for a very large U.S. prison system.

A. The basic optimization problem

Assume N inmates in need of placement across N prison beds, J of which are located in a high security facility with J<N. Define S_i as an observed risk score that is predictive of future institutional misconduct, where the index $i \in \{1,...,N\}$ is defined such that $S_i < S_j$ for all $i < j$. Define the indicator variable, H_i as equal to one for inmates assigned to a high security bed and zero otherwise. Actual offending observed during a defined period for any given inmate, O_i, depends on the risk signal, one's assigned security level, and a mean-zero error term according to the equation

(1)
$$O_i = \begin{cases} \alpha + \beta S_i + \varepsilon_i, & for H_i = 0 \\ \gamma(\alpha + \beta S_i + \varepsilon_i), & for H_i = 1 \end{cases}$$

where 0<γ<1 is inversely related to the suppression or incapacitation effect associated with being placed in a high security bed. We assume that the error term is independent of the risk signal used by the prison authority ($E(\varepsilon_i|S_i)=0$ for all *i*).

Arraying the collection of assignment choices into the vector $H' = [H_1 \quad ... \quad H_n]$, the optimization problem faced by the prison authority is to choose the value of *H* that minimizes the expected value of total offending within the institution subject to the resource constraint. Defining the vector *O* as the collection of realized offending levels, the optimization problem can be expressed compactly as

(2)
$$\min_H E[O'i \mid H] \quad subject \quad to \quad H'i = J,$$

where *i* is a conforming column vector with all elements equal to one. To illustrate more clearly the nature of this problem, one can make use of the offending equation (1) to write out the details of the objective function in (2). Doing so yields

(3)
$$E[O'i \mid H] = E\left[\sum_{i=1}^{N}(\alpha + \beta S_i + \varepsilon_i) - (1-\gamma)\sum_{i=1}^{N} H_i(\alpha + \beta S_i + \varepsilon_i) \mid H\right].$$

The first term within the expectations operator is the amount of offending that would be observed if none of the inmates were assigned to a high security bed, a terms that obviously does not depend on the choice of *H.* The second term is the amount of offending suppressed or incapacitated for a specific value of *H.* Hence, the minimization problem can be alternatively conceptualized as choosing *H* to maximize the amount of crime/institutional misconduct incapacitated by selective use of the high security facility.

Given our assumption that high security placement proportionally incapacitates,[4] the obvious solution is to assign the J inmates with the highest value of S_i to high security beds. Hence the elements of the optimal vector *H** are defined by the rule

(4)
$$H_i^* = \begin{cases} 0, & i \le N - J \\ 1, & i > N - J \end{cases}.$$

The principal test for optimality that we will offer once we introduce mandatory minimum overrides of this assignment process will draw on the relationship between the expected value of offending and the risk score in the neighborhood of the cutoff point that separates high security from low security inmates. To lay the groundwork, we graphically derive the shape of this function for this base unconstrained case in Figure 1. For low security inmates the expected value of offending will simply be $\alpha+\beta S_i$. For high security inmates, the comparable expected value will be $\gamma(\alpha+\beta S_i)$. Given the ordering of inmates in the index *i*, offending increases with S_i through inmate N-J, declines discretely, and then continues to increase with *i* yet at a slower rate.

B. Introducing mandatory minimum security placements for flagged offense/sentencing characteristics

Now suppose that K<J of the inmates in the system have a characteristic that triggers a mandatory minimum placement to the high security facility. In the system that we study empirically, there are several factors that can trigger a mandatory minimum security assignment, including but not limited to a sentence of life without parole (LWOP) or conviction for a sex offense. Let M_i be an indicator variable equal to one for inmates with such triggering characteristics. We will assume that M_i is orthogonal to S_i, but not to the error term in the offending equation. In other words, S_i does not

[4] We believe this assumption is quite reasonable. The less one's propensity to offend, the less offending there is to suppress. The assumption of proportionality is one simple way of allowing the incapacitation effect of high security placement to increase with underlying criminality.

predict M_i, but M_i may be predictive of the unexplained variation in observed offending. Under these assumptions, a mandatory minimum security placement may be efficiency enhancing to the extent that M_i reveals new information about the likelihood and extent of future offending.

For some proportion of the K inmates with M_i equal to one, the override imposes a binding constraint on the placement manager's security assignment choice. For others, the individual value of S_i will be sufficiently high for a high security placement irrespective of the triggering characteristic. To comply with the resource constraint, those with binding overrides will ultimately displace some inmates from high security beds whose placement is not constrained. This essentially increases the threshold value of S_i separating high security from low security inmates among those without an override from the value for inmate N-J in the unconstrained case to the value for inmate N-J' in the constrained case, where J' is by necessity less than J. Given the assumption of independence between M_i and S_i, coupled with the ordering of the index *i,* the new threshold will be implicitly defined by the equation

(5)
$$\frac{N-J'}{N}K = J - J'.$$

The term on the left hand side of (5) gives the number of inmates with a characteristic that triggers a placement override and that have values of S_i that are less than or equal to that for inmate N-J'. The right hand side of the equation gives the difference between the number of inmates placed in a high security facility according to observed risk score in the unconstrained case and the case with binding security overrides.

Imposing mandatory overrides for inmates with triggering characteristics alters the optimal assignment rule for the security placement manager. Specifically, the manager will still minimize the expected value of total misconduct by assigning the highest risk inmates to the high security facility.

However, the presence of inmates with the triggering characteristic limits the resources available to do so. In conjunction with equation (5), the new optimal assignment rule becomes

(6)
$$H_i^c = \begin{cases} 1, & if \quad M_i = 1 \\ 1, & if \quad M_i = 0, S_i > S_{N-J'}, \\ 0, & if \quad M_i = 0, S_i \leq S_{N-J'} \end{cases}$$

where we now add the superscript c to the assignment vector H to indicate the optimal choice subject to the added constraints created by mandatory minimum placement.

C. Mandatory minimums and efficiency in the allocation of inmates to security levels

At first blush, one might surmise that imposing an additional binding constraint on an optimization problem would necessarily lead to a relatively inferior outcome. In the present context however, it may be the case that the factors that trigger an override, and in turn, constrain the choice of the placement manager, may be revealing new information about the propensity of the inmate to offend while incarcerated. In most instances, mandatory minimum sentences are passed by legislators in response to the particulars of high profile events. For example, many attribute the introduction of federal mandatory minimums for crack cocaine offenses during the 1980s to media reports surrounding crack-related crime and perhaps to the high profile overdose death of a college basketball star (Vagins and McCurdy 2006). California's three-strikes law enacted via a ballot initiative in 1994 was largely a response to very high-profile and heinous crime committed by a recently paroled repeat offender.[5] To the extent that the political process generating mandatory minimum sentences endogenously identifies individuals who are particularly dangerous (and perhaps exposes weaknesses of current sentencing

[5] See Stanford Law School, *Three Strikes Basics*, the Stanford Three Strikes Project, https://www.law.stanford.edu/organizations/programs-and-centers/stanford-three-strikes-project/three-strikes-basics. Accessed on February 4, 2015.

practices), it may be the case that the subsequent constraints placed on actors in the sentencing process may be efficiency enhancing.

In the actual system that we study, the introduction of overriding security placements did indeed evolve in an endogenous manner. An early validation of the California Department of Correction and Rehabilitation's (CDCR) placement process noted the frequency with which placement officers overrode the designated assignment of inmates, usually placing individuals in security levels that were above the level prescribed by the actual security risk score (CDCR 2011). Presumably, this informal practice revealed the limitations of the risk score in use at the time and the gut instincts of placement officers regarding individualized information beyond the risk score that they decided to take into account in making security placements. The evaluator recommended that these overrides be formalized with mandatory minimum assignments, noting the common reasons cited for exceptional high security placement. In the context of our model, one might conceptualize the signal $M_i=1$ as reflecting evolved institutional knowledge regarding predictors of misconduct and the implicit shortcoming of the existing risk assessment system. Regarding allocative efficiency, it may be the case that triggering overrides may be effective in identifying very high risk inmates. Moreover, to the extent that institutional inertia or organized resistance to change in practice prevents the actual incorporation of new factors in the basic risk score, the use of mandatory minimum may be a second-best response.[6]

To explore these issues with our model, we use the structure that we have developed thus far to ask two questions. First, under what conditions would the introduction of these mandatory minimums coincide with the optimal assignment rule given information on S_i, M_i, and the relationship between these variables and actual future offending? Second, under what conditions would the mandatory

[6] In the California system, the underlying risk score depends on a very limited number of factors, is additively linear, doesn't allow for interaction terms, and most likely does not fully extract the predictive power of the factors that are included. While we will discuss the scoring system in more detail in the next section, it is worth noting here that it is entirely possible that some of the characteristics triggering mandatory minimum placements add predicted power above and beyond the risk score.

minimums be efficiency enhancing (but not necessarily optimal) relative to the unconstrained problem that ignores these signals?

To explore the first question, suppose that the signal M_i is predictive of future offending such that $E(\varepsilon|M_i=1) > E(\varepsilon|M_i=0)$. Parameterize the effect of the signal on future offending by $\delta = E(\varepsilon|M_i=1) - E(\varepsilon|M_i=0)$ and redefine the error term of the offending equation such that $\varepsilon_i = \delta M_i + \eta_i$, where $E(\eta_i|S_i,M_i)=0$. The offending equation given by (1) above thus becomes

$$O_i = \begin{cases} \alpha + \beta S_i + \delta M_i + \eta_i, & for H_i = 0 \\ \gamma(\alpha + \beta S_i + \delta M_i + \eta_i), & for H_i = 1 \end{cases} \qquad (7)$$

Absent mandatory minimum placement overrides, the optimal rule would still be to rank individuals according to the expected value of offending in (7) and assign the J inmates with the highest values to the high security institution. Define this optimal assignment choice vector as H**. Hence, the question at hand is under what conditions would H^c=H**?

One can show that even with the mandatory minimum restrictions, H^c may still be optimal. To see this, we can focus on the expected value of offending in the low security facility, since the risk ordering of inmates is preserved within facilities. For H^c=H**, it must be the case that all inmates with binding overrides have an expected value of offending at least as great as the inmate with the highest risk score among unconstrained inmates in the low security facility. If this were not the case, than it would be possible to swap the assignments of an inmate with a mandatory minimum for a low security inmate without a mandatory minimum and reduce the expected value of total offending. More formally, efficiency requires $\alpha + \beta S_i + \delta \geq \alpha + \beta S_{N-J'}$, for all *i* with triggering characteristics. This implies that

(8) $$S_i \geq S_{N-J'} - \frac{\delta}{\beta},$$

for all *i* with M_i=1. The condition in equation (8) requires that the observed risk score for all individuals with binding overrides must be no less than the threshold value applied to inmates without the triggering characteristic minus δ/β. This latter ratio gives the variation in S that would yield an impact on the expected value of offending equivalent to that of having M_i=1. Condition (8) places a lower bound on the support of S among those with binding mandatory minimums under the assumption that the mandatory minimum placement yields the optimal assignment rule.

This condition in conjunction with the implicit ordering of inmates created by the assignment rule in equation (6) yields an empirical prediction under the null hypothesis that the mandatory minimum pushes the system to H**. To derive this prediction, we first derive explicit expressions for the expected value of offending conditional on the risk score, the signal M_i, and the assignment rule H^c. This function is given by

(9) $$E(O_i \mid S_i, M_i, H^c) = \begin{cases} \alpha + \beta S_i, & for\ i \leq N-J', M_i = 0 \\ \gamma[\alpha + \beta E(S_i \mid i \leq N-J') + \delta], & for\ i \leq N-J', M_i = 1 \\ \gamma[\alpha + \beta S_i], & for\ i > N-J', M_i = 0 \\ \gamma[\alpha + \beta S_i + \delta], & for\ i > N-J', M_i = 1 \end{cases}$$

We will focus our attention on the second and third lines of equation (9); the expected value function for inmates with binding mandatory minimums and the expected value function for high security inmates with no triggering override characteristic. The efficiency criteria described in equation (8) above implies that the expected value of offending among inmates with binding mandatory minimums must be greater than or equal to the expected value of offending for the low security inmate with the highest value of S_i among the unconstrained. Making the assumption that the inmate with the highest value of S_i among low security inmates is roughly comparable to the inmate with lowest value of S_i among unconstrained inmates in the high security facility –i.e., $S_{N-J'} \approx S_{N-J'+1}$ – this condition would also imply that the expected values of offending among constrained inmates should be at least as great as the expected value of offending for the marginal high security placement with M_i=0. In other words, it should be the case that

(10) $$\gamma[\alpha + \beta E(S_i \mid i \leq N - J') + \delta] \geq \gamma[\alpha + \beta S_{N-J'}]$$

under the assumptions that H^c=H** and that $S_{N-J'} \approx S_{N-J'+1}$. Simple rearrangement yields

(11) $$E(S_i \mid i \leq N - J') \geq S_{N-J'} - \frac{\delta}{\beta}.$$

Allocative efficiency requires that the right hand side of equation (11) bound from below the support of S_i for inmates with M_i=1. Hence, the conditional expectation on the left hand side of (11) must be greater than or equal to this lower bound under the null hypothesis that H^c=H**. To be sure, this is a necessary but not sufficient condition for efficiency. Condition (11) may still hold with some values of S_i among the constrained falling short of the threshold value on the right hand side. However, a finding that average offending levels among the constrained falls short of the average for marginal high security inmates would be sufficient to reject the null.

Figure 2 graphically displays three of the elements of the expected value function in (9) assuming that equation (11) holds. While we cannot generate a prediction regarding the expected value of offending for constrained inmates relative to the marginal low security inmate,[7] efficiency requires an expected offending level for the constrained that is at least as great as that of the marginal high security inmate. In the empirical work to follow, we estimate the elements of the function depicted in Figure 2 and formally test the condition implied by equations (9) and (10) under the null hypothesis that $H^{**} = H^c$.

An alternative question one can ask of the model concerns whether the implementation of the mandatory minimum constraints for select offenders yields lower expected offending levels. This would be the case if the risk score systematically ignored information about each offender and was slow to adjust to evolving knowledge for whatever reason. One can zero in on this question by focusing on the J-J' inmates with M_i=0 who are displaced by inmates with values of the risk score below the new threshold but with binding mandatory minimum placement scores. If it can be shown that the average constrained inmate is more likely to offend than the average displaced inmate, than the introduction of mandatory minimums would be efficiency enhancing, if not first best.

An alternative manner of framing this question would be in terms of the effect of swapping the housing placements of constrained and displaced inmates. For mandatory minimums to enhance efficiency, it would have to be the case that drawing a constrained inmate at random and swapping his housing level with a randomly chosen unconstrained inmate who is displaced to a lower security level would lead to an increase in overall offending. To be specific, the increase in crime associated with moving a randomly chosen constrained inmate down would be

[7] Depending on the size of δ, the expected value of offending for constrained inmates can either exceed or fall short of the expected value of the highest risk low security inmates. This is due to the fact that while M_i=1 enhances offending among those with mandatory minimums, offending is suppressed by $(1-\gamma)$ as a result of high security placement.

$$E(O_i \mid M_i = 1, H_i = 0, i \leq N - J') - E(O_i \mid M_i = 1, H_i = 1, i \leq N - J') = (1-\gamma)[\alpha + \beta E(S_i \mid i \leq N - J') + \delta].$$

(12)

The corresponding decrease in offending associated with moving up to the high security facility a randomly chosen displaced inmate is

(13) $$E(O_i \mid M_i = 0, H_i = 1, N - J < i \leq N - J') - E(O_i \mid M_i = 0, H_i = 0, N - J < i \leq N - J) \\ = -(1-\gamma)[\alpha + \beta E(S_i \mid N - J < i \leq N - J)].$$

Hence, the net change in crime associated with such a random swap would be given by adding equations (12) and (13)

(14) $$\Delta_{swap} = (1-\gamma)[\beta\{E(S_i \mid i < N - J') - E(S_i \mid N - J \leq i < N - J')\} + \delta].$$

This is positive only if the effect of having a triggering characteristic on offending exceeds the difference in the expected value of S between these two groups multiplied by the effect of S on offending in the lower security level.[8] In the empirical work that follows, we present a strategy for estimating the individual components of (14) and assessing whether the observed impact of mandatory minimums is consistent with an efficiency improvement in the allocation of inmates across security levels.

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[8] Notably, the intercept terms for offending in both levels drops out of the equation. It is unclear *a priori* what the size and sign of the intercepts should be and whether it is possible to have an increase in the intercept as we move to higher security facilities even if higher security facilities are better at mitigating the effects of increments in risk on offending. Lerman (2013) finds that placement in higher security facilities aggravates criminal thinking and other potential predictors of anti-social behavior. In addition, the CDCR expert panel evaluation of which we were both participants (2011) found some evidence of a criminogenic effect of higher placement on institutional misconduct (CDCR 2011).

3. Description of the Security Placement Process in California State Prisons, Empirical Strategy, and Description of the Data

We assess whether the use of mandatory minimums yields the optimal allocation of criminal justice resources, and whether such practices improve the efficiency of resource allocation within the context of the California state prison system. During the time period studied here, the California prison system was the second largest system in the nation (second only to the federal prison system). California systematically assesses inmates for security level placement at intake and through periodic reviews with an eye on allocating the highest risk inmates to the most secure and restrictive facilities. California also employs a set of mandatory minimum placement practices for a select group of inmates with specific triggering characteristics in a manner quite close to that described in our theoretical model. In this section, we first describe the classification and assignment process for the state. Next, we describe our administrative data set. Finally, we present our empirical strategy for operationalizing the two tests of efficiency that follow from our theoretical model.

A. The Inmate Classification Process

California's process for assessing security classification and specific institutional placements involves both an initial assessment at intake as well as periodic re-assessments occurring at roughly annual intervals. For new prison admissions, the California Department of Corrections and Rehabilitation (CDCR) collects information on a variety of factors for each new inmate including but not limited to sentence length, age, gang affiliation, and whether or not the inmate has had prior incarcerations as a youth or an adult[9] (the form for this initial intake classification process for new court commitments, CDCR Form 839, is presented in Appendix A below). Inmates are assigned a preliminary classification score based on these background characteristics and prior behavior while incarcerated. The classification tool assigns weights to each of the predictive factors; factors that predict higher criminality

[9] This includes one possible point each for jail sentences exceeding 30 days in length, youth commitments to the California Youth Authority or any other state/federal juvenile incarceration, and prior adult commitments to CDCR or any other state/federal adult prison.

are awarded more points (for example, longer sentence length, gang membership, being under 25 years of age). The original classification system implemented in the early 1980s relied on consensus opinion regarding predictors of institutional misconduct rather than empirical evidence. Nonetheless, the underlying risk score has been empirically validated several times over the past few decades with each evaluation concluding that the composite score from this process tends to predict misconduct risk.

During incarceration, inmates go through a reclassification process at least once a year. The classification periods consist of 6 month intervals, and thus it is typically the case that an annual review encompasses two review periods.[10] At each reclassification, behavior (good and bad) since the last hearing is reviewed. Behavioral problems lead to upward points adjustments and the absence of any misconduct is rewarded with downward[11] points adjustments to the preliminary score assigned at the previous hearing. Appendix A also includes the worksheet completed at these reclassification hearings and illustrates the point adjustment process (CDCR Form 840).

For most inmates the preliminary classification score resulting from the intake assessment and cumulative reclassification provides the final classification score used to make a security recommendation and placement. However, some inmates qualify for a mandatory minimum point allocation. Mandatory minimum points are triggered by certain characteristics of the sentence or of the offense. Table 1 provides a complete list of triggering characteristics for mandatory minimum placement along with the minimum-points threshold. Some of these factors are quite specific (for example, life-without-parole (LWOP) sentences). Others seem to in practice afford a fair degree of discretion to

[10] Occasionally, inmates are reviewed after 1 period (6 months instead of 1 year).

[11] It is important to note that inmates are only eligible for downward point adjustment if there is no misconduct during the review period; if there is misconduct, then presence of the characteristics that would otherwise adjust the point value downwards is irrelevant.

override the basic preliminary score. For example, "public interest cases" and even "r-suffix" cases for sex offenses can be applied with a degree of flexibility.[12]

An inmate's final placement score is equal to the maximum of the preliminary score calculated via the intake and reclassification process and the mandatory minimum-points restrictions listed in Table 1. This placement score generally determines an inmate's housing security level. Table 2 lists the four security levels in California state prisons, the placement points range corresponding to each security level, and a very general description of the institutions within each level. As is evident, higher levels are considerably more restrictive in terms of inmate housing, internal movements, and the degree of supervision (often armed supervision) by correctional officers.

Placement scores generally determine an inmate's housing security level, although there are many inmates who are housed outside of their designated levels. This can happen for a number of reasons. First, upon admission and before classification, inmates are held at reception centers waiting for processing and placement. Second, the reclassification process often results in a change in one's designated security level (note, in many cases well behaved inmates can experience declines in their placement score of up to 8 points[13] within a year). While upward and downward moves generally occur within a few months (the median is 76 days for those moving down and 115 days for those moving to higher security levels), at any given time there are thousands of inmates who are housed outside of their designated security level and awaiting a transfer. Third, some inmates may be housed outside of their designated levels for reasons pertaining to their safety (for example, CDCR staff make a concerted effort

[12] In informal conversation with corrections counselors we were told that R-suffix can be applied for behavior while incarcerated and even the content of mail sent to and from inmates from outside the prison.

[13] Technically the classification process allows for inmates to decline 16 points in a given year. However, eight of those points come from being "continuous minimum custody" which is a designation only afforded to inmates in Level I prisons. As a result, most inmates are not eligible for a 16 point reduction. Any inmate housed above Level I is eligible for up to 8 points.

not to house rival gang members in proximity to one another), medical conditions, or other such considerations that may constrain the placement process.[14]

Fourth, in addition to security classification placement scores, inmates also receive what are known as "custody designations." The custody designation governs the level of supervision an inmate will receive within a given institution, and can determine such factors as the type of housing allowed, the amount of time in cell, whether and when an inmate can work and participate in other programs and qualifications for jobs. Custody designations are not empirically determined or empirically based. Many of the factors determining custody designation are similar to the factors determining security classification, though the overlap is not perfect. Moreover, inmates who have a particularly stringent custody designation (for example, due to notoriety) may not be placed in lower level facilities, as these facilities are not equipped to meet the required level of supervision. Finally, some inmates are placed outside of their designated security levels due to capacity constraints on custody designations. For example, inmates who are Close B custody must be housed in cells. Most Level II (medium) security facilities house inmates in dormitories, inmates who are Close B custody cannot be housed in Level II facilities unless celled housing is available. The time period studied here is one when the system was particularly overcrowded (over 200 percent of rated capacity) with the most severe capacity problems in the higher security facilities.

B. Description of the Data

The data that we analyze includes all males housed in a CDCR institution for all of FY08/09 who are not on death row and for whom we can observe a complete review period between classification hearings. In total, we have observations on roughly 79,000 individuals. For each inmate, the data set includes information on all serious rules violation reports (our primary measure of institutional misconduct/offending) acquired during the review period, demographic information about each inmate,

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[14] CDCR facilities are heavily capacity constrained; classification officers do not have very much flexibility to override the classification system for discretionary purposes.

information regarding sentencing and controlling offense, information on housing and security level, and information on several other personal and institutional characteristics.

Key variables in our empirical analysis are the preliminary and placement scores for each inmate. We observe three sets of consecutive scores. The first are the scores for each inmate one day prior to the beginning of the observed review period. Hence, if a hypothetical inmate's review period runs from July 1, 2008 through June 30, 2009, the initial set of scores apply to this inmate on June 30, 2008 and should determine housing placement up to and at the beginning of the review period. We also observe new preliminary and placement scores at the beginning of the review period (after the initial July 1, 2008 classification hearing for our hypothetical inmate) as well as the scores at the end of the review period.

Figure 3 presents the empirical distribution of the preliminary score (with censoring for scores over 100) at the beginning of the review period while Figure 4 presents the empirical distribution of changes in the preliminary score over the observed review period. There is a notable mass of inmates with zero points. Moreover, the change distribution in Figure 4 reveals that 60% of inmates experience a decline in points and 80% experience either no change or a decrease. Table 3 presents key percentiles of the distribution of our three observed preliminary scores. The figures reveal a pattern consistent with the change distribution, with an increasing proportion of inmates with zero points and declines in the percentile values across these three consecutively measured preliminary scores.

Figure 5 presents the empirical distribution of placement scores at the beginning of the review period. Again, the placement score is equal to the preliminary score for inmates with no mandatory minimum and the maximum of the preliminary score and any mandatory minimums that apply for inmates with triggering characteristics. The mandatory minimums create spikes in the placement score distribution at the cutoff points placing individuals in levels II, III, and IV (at 19, 28, and 52 points, respectively). The largest spike occurs at the level II threshold, as the mandatory minimums that provide for 19 points are most broadly applicable to the inmate population.[15]

Given the broad, leftward shift in the point distribution with each review, the proportion of inmates in our observed cohort with housing placements constrained by mandatory minimums increases over time (Figure 6). Using the preliminary and placements scores coming into the review period, at the beginning of the review period, and the end of the review period, the figure displays the proportion of inmates that have binding mandatory minimums at 19, 28 and 52 points. Across the three sets of scores (encompassing the results of two reclassification hearings corresponding roughly to a two-year period) the proportion whose placement is constrained by the mandatory minimum increases from 24 to 31.1 percent, with a 6.2 percentage points increase for those constrained to level II and roughly a one percentage point increase in those constrained to either levels III or IV.

Our theoretical model highlights the tradeoff associated with the use of mandatory minimums. By design the system will up-classify inmates with relatively low observed risk scores, presumably due to the information revealed by the triggering characteristics (in particular, the value of the triggered characteristic in predicting future offending). Figure 7 documents the degree to which the mandatory minimums open a difference in the risk score between inmates without mandatory minimums who are just above the security thresholds and inmates with triggering mandatory minimum characteristics. The figure presents a scatter plot of average preliminary scores against average placement scores for inmates without binding mandatory minimums (solid points) and for inmates with binding mandatory minimums (the three *x*'s). Here we use the preliminary and placement scores coming into the beginning of the period, although the figure using the alternative scores pairing are nearly identical. The average preliminary scores of constrained inmates are indeed low relative to unconstrained inmates with the

[15] The security classification system is designed to minimize the risk of both institutional misconduct and also escape. The most dramatic difference between the facility security levels is that Level I facilities do not have secure perimeters and the mandatory minimums at 19 points are mostly designed to prevent qualifying inmates from being housed in facilities without secure perimeters.

comparable placements scores. To be specific, inmates with binding minimum placement scores of 19, 28, and 52 points have average preliminary scores of 5.29, 4.55, and 17.56 points. Interestingly, all three averages would place those inmates below the level I/II cutoff.

In our principal empirical analysis, we restrict the sample to inmates who are conventionally housed in levels I through IV, effectively dropping inmates in reception centers, inmates in secured housing units, and inmates in specialized housing associated with medical or security concerns. Imposing these restrictions shrinks our sample from 79,555 observations to 65,500. Our key outcome variables are indicators of having acquired a rules violation report (RVR) over the course of the review period. RVRs mark both serious as well as non-serious (or in the language of CDCR, administrative) violations. We focus on the subset of violations deemed serious. Inmates found guilty of these violations in addition to having points added to their preliminary scores may also lose earned good time credits and be referred to the local district attorney for further prosecution.

Table 4 shows the incidence of types A1/A2, BCD, and EF serious rules violations for inmates housed in levels I through IV. The table also provides examples of actual actions that would fall into each category. As is evident from the examples, these types of violations are indeed quite serious and often constitute felonious acts, though they are not always formally prosecuted by the state. While institutional misconduct rates are lower in level II relative to level I, most likely due to the greater restrictions placed on level II inmates and the strict separation from the outside world,[16] misconduct rates are generally higher in higher security institutions. For all security levels, the most serious offenses are also the least likely to occur.

As a final set of descriptive statistics, Table 5 presents some key characteristics of inmates housed in each level. There are two indicators of mental health issues, being in the Correctional Clinical

[16] All Level II, III, and IV facilities have secure perimeters with armed coverage by corrections officers in towers. Nearly all Level III and IV facilities are surrounded by triple fencing with the center fence electrified with a lethal charge. Level I facilities are surrounded by chain link fencing, they are relatively lightly monitored. Level I inmates can easily have contact with outsiders, both planned and otherwise.

Case Management System (CCCMS) and being in the Enhanced Outpatient Program (EOP). Both statuses are indicative of serious mental health problems (with EOP inmates more acutely symptomatic than CCCMS inmates), yet both are outpatient programs for inmates housed in the general population.[17] The proportion of inmates in outpatient mental health programs increases monotonically with security level. Inmates tend to be younger in the higher security level institutions and are considerably more likely to be identified gang members by CDCR. In addition, the distributions of inmates across conviction offense differ greatly across security levels. Higher security institutions tend to house those convicted of serious violent crime. Lower security institutions are more likely to house those convicted of drug offenses and relatively less serious property crimes.

C. Empirical Strategy

Our empirical strategy is twofold. First, we use the administrative data on inmate risk scores, security assignment, and institutional misconduct to estimate the elements of the expected value of offending function presented in Figure 2. In particular, we wish to assess whether the offending levels of inmates that are constrained to higher security levels by a mandatory minimum placement score departs from the offending-placement score profile observed for inmates with mandatory minimums. As derived from our theoretical model, a negative departure (in particular, offending levels that falls short of those unconstrained inmates with comparable placement scores) would be evidence of allocative inefficiency. We test for efficiency by simply estimating the difference in offending levels between constrained inmates and unconstrained inmates with placement scores that place them right at the level II, III, and IV placement thresholds, with an without controls for covariates.

In addition, given the relatively small number of observations of unconstrained inmates with exactly 19, 28, and 52 points, we also estimate the offending-placement score profile over a broader range of points allowing for discontinuous breaks at the points threshold among the unconstrained,

[17] See the CDCR Mental Health Program Guide, http://www.cdcr.ca.gov/dchcs/docs/mental%20health%20program%20guide.pdf accessed on January 29, 2015.

differential quadratic functions on either side of the points cutoffs, and a differential intercept for inmates with binding mandatory minimum scores. Specifically, we define $\min52_i$ as an indicator variable for an inmate with a binding mandatory minimum placement score of 52 points. If we restrict the sample to inmates with placement scores between 29 and 70 points (a point range surrounding the level III/IV cutoff) and to inmates with either binding 52 point mandatory minimums or those without mandatory minimums, the functions in Figure 2 can be estimated by the equation

(15) $$O_i = \alpha_o + \alpha_1 S_i + \alpha_2 S_i^{\ 2} + \beta_0 above_i + \beta_1 above_i S_i + \beta_2 above_i S_i^{\ 2} + \delta \min 52_i + \lambda X_i + \varepsilon_i$$

where S_i is the placement score, $above_i$ is a dummy variable equal to one for inmates at or above the level IV threshold, X_i is a vector of covariates to be discussed with the presentation of the results, and ε_I is a mean-zero error term. The estimate of the coefficient δ presents our test for efficiency. A significant negative value would be indicative of inefficiency in the use of high security beds. We estimate equation (15) for each security cutoff for each of the following outcomes: acquiring any rules violation report (RVR) over the period, acquiring and A1A2 violation, acquiring a BCD violation, and acquiring an EF violation.

We also wish to assess whether the use of mandatory minimums, if not first best, leads to an improvement in terms of the degree to which the placement process identifies and properly classifies the highest risk inmates. Equation (14) in our theoretical model identified the conditions under which this would be true. For ease of exposition, we reproduce this equation here

(14R) $$\Delta_{swap} = (1-\gamma)[\beta\{E(S_i \mid i < N - J') - E(S_i \mid N - J \le i < N - J')\} + \delta].$$

Ignoring the incapacitation term (1-γ) for the moment, enhanced efficiency would require that the effect of a triggering characteristic on offending, δ, must exceed in absolute value the first term within brackets on the right hand side. This term gives the effect of additional points on offending in the low security level multiplied by the difference in expected value of S between constrained inmates and displaced inmates. Since the first conditional expectation is less than the second, this first term is negative and should be thought of as the offending that one is not partially incapacitating as a result of displacement due to the mandatory minimums.

We empirically evaluate this condition in the following manner. We restrict the sample to inmates housed in specific security levels who are unconstrained by a mandatory minimum. Note this can include both inmates with and without a triggering characteristic. For example, restricting the sample to inmates in level IV with placement scores above 52 will retain observations without a mandatory minimum 52 points as well as those with a mandatory minimum whose placement is not constrained due to the fact that their preliminary score exceeds 52. We then use this restricted sample to estimate δ by regressing the misconduct outcomes on a dummy for having a mandatory minimum score that may eventually constrain one to their current security level. We also include controls in these models for one's placement score as well as custody level and outpatient mental health status as the additional constraints/services associated with these values may confound the effect of the triggering characteristics. The coefficient on placement score would then provide an estimate of β that is specific to the security level of the sub-sample.

We repeat this for inmates in level III and level II to generate security level-specific estimate of δ and β. Finally, restricting the sample to level I inmates and regressing the misconduct outcomes on placement score and other covariates would provide an estimate of β for level I.[18]

To estimate the differences in the conditional expectation of S, we hypothetically re-rank inmates based on preliminary scores to identify who would be moved up and who be moved down if the use of mandatory minimums was discontinued (the details of this re-ranking are discussed in greater

[18] Note, for this level there will be no inmates with binding mandatory minimums.

detail below with the presentation of the results). We then use these two groups of individuals to estimate the conditional expectations $E(S_i|i<N-J')$ and $E(S_i|N-J\leq i<N-J')$. With estimates of δ, β, and the two conditional expectations of preliminary scores, we can evaluate the sign of equation (14R).

Before proceeding to the empirical results, we must briefly discuss which placement scores we use to characterize the inmates in our sample. Recall, we observe three sets of placement scores: (1) those coming into the observed review period, (2) those following the reclassification at the beginning of the observed review period, and (3) those pertaining to the reclassification hearing at the end of the observed review period. The second set provides the formal security classification that is closest to the variable S in our theoretical model, as this is the system's risk assessment pertaining to the period for which we observe behavior. However, one's housing assignment is more closely aligned with the first placement score. This is demonstrated in Figures 8 and 9. Figure 8 presents the proportions housed in levels I through IV by placement score measured prior to the beginning of the review period while Figure 9 presents simile scatter plots using placement score after the first observed reclassification hearing. As is readily observable, the proportion placed out of their designated security level is higher after the reclassification, a fact that is subsequently remedied by inmates being moved between security levels. We believe that beginning placement scores are the appropriate scores as these are the scores reflecting the prison system's ordering of inmates over the period for which we observe inmate behavior. In our empirical work below, we address misaligned security placement by controlling for the proportion of the review period housed in each security level (we can observe moves, move dates, and origin and destination security level for all inmate in the sample). We should note however that the results presented below are not sensitive to which placement score is used to rank the inmates.

4. Empirical Results

A. Testing for optimality

We begin by presenting the raw empirical relationship between offending rates and placement scores for inmates without binding mandatory minimums and inmates who are constrained by the mandatory minimum. Figure 10 presents offending levels for inmates with placement scores ranging from 29 to 100 points. Offending rates (the proportion with a specific RVR) for inmates without a 52-point mandatory minimum are indicated with small dots, while the offending rate for inmates with a binding 52 point mandatory minimum is given by the large dot.[19] For any RVR, for BCD violations and EF violations, constrained inmates are considerably less likely to offend than all unconstrained inmates depicted in the figure, inclusive of all inmates with lower placement scores. For the most serious violations (A1A2), offending among the constrained appears slightly below the expected value of offending-placement score profile, yet the departure is not as stark as that observed for the other offense categories. Figure 11 reveals nearly identical patterns around the level II/III cutoff for all offenses, even A1A2. Figure 12 shows notable downward departures for constrained inmates for any RVR, BCD offenses, and EF offenses, while the level of offending for A1A2 offenses does not deviate.

Table 6 formally tests whether these deviations are statistically significant. Panel A presents the results from linear probability regressions of observing a specific type of violation on a dummy variable indicating a mandatory minimum of 52 points with the sample restricted to inmates that have exactly 52 points. Specification (1) presented a simple bivariate estimate. Specification (2) adds three controls for the proportion of the review period housed in level II, III and IV, as well as dummy variables for custody level,[20] whether one is an EOP or CCCMS inmate, and a control for the length in days of the review period. For any RVR, BCD violations, and EF violations, we find large negative effects of mandatory

[19] Note, inmates with mandatory minimums of 52 with placement scores above 52 are not included in the construction of this figure.

[20] Custody designation categories indicate the required level of supervision within security level. In order of stringency, the designations range from Max, close A, close B, medium A, medium B, minimum A, and minimum B. There are no maximum custody inmates in our sample, as secure housing unit (SHU) individuals are not included in the data set. In specification (2) we simply add dummy variable for each custody level.

minimum designation on the likelihood of offending over the review period. Adding controls for custody designation, security housing level, and other factors does not alter the estimates.

To assess why the constrained inmates offend at a discretely lower level, specifications (3) and (4) consecutively add the inmate's preliminary score (which will equal 52 for unconstrained inmate but be less than 52 and vary across constrained inmates) as well as age. There are several notable findings here. First, controlling for preliminary score greatly diminishes the residual difference between inmates with binding mandatory minimum and inmates without. Second, in nearly all models underlying preliminary score is a significant predictor of offending. Finally, we find a consistent, negative, and highly significant effect of age on institutional misconduct.

These results basically lead us to reject the hypothesis that the use of mandatory minimum assignment to level IV is optimal. The lower level of offending among constrained inmates is largely explained by their lower preliminary scores. Moreover, even though the scoring process takes into account age and assigns lower points to older inmates, the independent significant effect of age suggests that the current scoring system does not make optimal use of age as a predictor of risk of institutional misconduct.

Panel B present comparable analysis for inmates with exactly 28 points (the level II/III threshold) while panel C presents comparable analysis for inmates with exactly 19 points (the level I/II cutoff). The results are comparable and basically confirm the findings demonstrated graphically in figures 11 and 12. For inmates with exactly 28 points, offending levels are discretely and significantly lower for inmates with binding mandatory minimums of 28 points for all offense categories. Similarly, these differences are entirely attributable to observed differences in underlying preliminary scores and differences in age. The results in panel C for inmate with exactly 19 points are comparable, though there are some notable differences relative to the results in panels A and B. We find significantly lower offending rates among inmates with binding mandatory minimums for any RVR, a BCD violation, and an EF violation in the bivariate regressions presented in specification (1). Here, however, adding controls for the proportion of time spent in each security level attenuates these differences considerably. This is driven largely by the fact that inmates with 19 points who do not have binding mandatory minimums are considerably more likely to spend some time in level I housing and level II appears to incapacitate this sub-sample of inmates relative to level I. Nonetheless, even after accounting for security and custody level variables in specification (2) we still find significantly lower offending levels among those with binding minimums. Similar to our estimates for the higher level cutoffs, controlling for preliminary score and age explains the entire residual differential for each outcome.

Table 7 presents estimates of the deviation in offending rates of constrained inmates from the overall offending-placement score profile over the points range bracketing the thresholds. The regression results correspond to the coefficient on the binding dummy in equation (15) above. Specification (1) includes a quadratic in placement score, a dummy for being at or above the thresholds, interaction terms between this dummy and the quadratic placement score variables, and a dummy for having a constraining minimum placement score. Specification (2) adds custody level controls, housing level controls, dummies for EOP, CCCMS, and a control for length of the review period. Finally, specification (3) adds age and preliminary score. Recall, the sample here is limited to inmates in the noted point range who do not have a mandatory minimum at the encompassed cutoff or who have a binding mandatory minimum. For the level IV analysis, we truncate the sample from above at 70 points to focus on the neighborhood about the cutoff. The results are not sensitive to this choice.

The table only presents the dummy on having a binding mandatory minimum to conserve space. The results are basically consistent with what we find in Table 6. Constrained inmates are generally much less likely to offend relative to unconstrained inmates with comparable placement scores. While the estimates are slightly lower than those observed in Table 6, the magnitudes, significance levels, and cross-violation patterns are quite similar. Moreover, the observed differences are almost entirely attributable to the mean differences between unconstrained and constrained inmates in average preliminary score and age.

Collectively, the findings in Figures 10 through 12 and Tables 6 and 7 quite decisively reject the hypothesis that the use of mandatory minimums is leading to the optimal assignment rule. In fact, the results suggest that this particular prison system is disregarding valuable information that is predicted by their scoring system by using mandatory minimums to assign inmates to security levels.

B. Are the mandatory minimums efficiency enhancing?

In our theoretical model, we derived the conditions under which the use of mandatory minimums may enhance efficiency. In a general sense, this would occur when the underlying risk score does not incorporate all information about the offender in making the risk assessment, or perhaps does not adequately model the relationship between observed and included factors and the risk being predicted. We have seen above that the partial correlation between age and offending is consistently significant holding constant preliminary score as well as other institutional covariates. This fact alone strongly suggests that the preliminary score is certainly imperfect and can be improved upon. With this in mind, in this section we empirically assess whether the use of mandatory minimums in inmate assignment leads to lower overall levels of institutional misconduct.

We derived a condition under which this would be true based on the hypothetical exercise of randomly selecting an inmate with a binding mandatory minimum and swapping his placement with a randomly chosen inmate who is displaced to a lower security level by the use of mandatory minimums in conjunction with the resource constraint. We showed that the effect of the triggering characteristic on the likelihood of offending would have to be larger than the difference in offending between the two swapped inmates in the lower security level based on the preliminary score alone (equation 14 above). Here we derive these two components and assess their relative size.

The main empirical results here are based on sub-samples with the following restrictions. First we restrict the sub-sample to inmates housed in a specific security level (level IV for example) for the entire observed review period. Next, we restrict the sample to inmates with placement points exceeding the security level's lower point cutoff. Hence, for level IV we would restrict the sample to inmates with 53 or more points. Note, this subsample will contain both inmates without a mandatory minimum of 52 points as well as inmates with such mandatory minimums that have yet to become binding.

We use these sub-samples to estimate two key parameters: (1) the difference in offending levels between those with the triggering characteristics and those without (the parameter δ in our theoretical model), and (2) the marginal effect of an additional placement point on the likelihood of offending. Table 8 presents estimates of the first parameter. Panel A presents results for inmates housed in level IV with points ranging from 53 to 100. The first column presents the results from a bivariate regression of an indicator of institutional misconduct on a dummy variable measuring having a mandatory minimum of 52 points. The second specification presents the comparable coefficient holding constant placement score, custody level dummies, mental health program status, and length of review period; panels B and C present similar estimates for inmates in levels III and II (providing effect sizes on offending of having binding mandatory minimums of 28 and 19 points, respectively). Remarkably, nearly every coefficient in the table is negative and many are statistically significant, the very opposite of what would be needed for these practices to be efficiency enhancing. Among level IV inmates, there is a small positive and significant effect of being a mandatory-minimum inmate on A1A2 offenses in the bivariate regression. However, once basic controls are added to the specification, this coefficient goes to zero and becomes statistically insignificant.

Table 9 presents estimates of the marginal effect of an additional placement point on the likelihood of committing each type of offense over the review period. The coefficients for Levels II, III, and IV come from specification (2) in Table 8 in Panels C, B, and A respectively. For Level I, we estimate a separate model for all inmates with placements scores below 19 housed in a Level I facility. To the extent that the marginal effects of a placement point on offending is lower in higher security levels, swapping the placements of a constrained high security inmate with a relatively low placement score for a low security inmate with a relatively high placement score would reduce overall offending, ignoring the impact of the triggering characteristic. For Levels II, III, and IV we do indeed find that the marginal effect of an additional placement point on having any RVR declines as we move up security levels. This holds for the any RVR outcome, for BCD violations and for EF violations. For the most serious A1A2 violations, the marginal effect is positive and comparable in Levels III and IV and negative for the lower levels. In addition, the models for Level I reveal a relatively modest offending-placement score profile.

Table 10 provides the final factors needed to evaluate whether the use of mandatory minimums within the context of the California state prison enhances efficiency. Specifically, the table presents the number of inmates with binding mandatory minimums at each security level, the number of lower security inmates who are displaced downward by the use of binding mandatory minimums (and by extension, the number who would be moved up if inmates were ranked on preliminary score alone), the average preliminary scores of displaced inmates, and the average preliminary scores of the inmates who basically displace them.[21] The results in the final two columns indicate that the average preliminary

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[21] We identify displaced inmates and inmates who would be moved down if the use of mandatory minimums were abandoned in the following manner. We will use Level IV inmates to illustrate. First, we tabulate the number of inmates with mandatory minimums of 52 points who have preliminary scores less than 52 points. Next, we take all inmates without a binding minimum of 52 points that have preliminary scores below 52, add the inmates with a binding mandatory minimum, and rank the joint set of observations according to their preliminary score. Next, we hypothetically assign the X inmates with highest preliminary scores to Level IV and everyone else to Level III, where X equals the count of inmates with binding mandatory minimums. The set of X inmates will include both inmates with binding mandatory minimums with very high preliminary scores as well as inmates who are not constrained but who are hypothetically moved up. The frequency count of the second group is presented in the second column of the table. Finally, we calculate the average preliminary score of those who would be moved up as well as the average preliminary score of those who be moved down. For the Level I/II thresholds, the number with binding minimums is large enough to dip into the population of inmates with zero points. To address this issue, we first

score of those who would be moved up if mandatory minimums where abandoned greatly exceeds the average preliminary score of inmates who would be moved down.

The analysis in Tables 8 through 10 can be summarized as follows. Table 8 demonstrates that the characteristics triggering a mandatory minimum do no predict higher offending levels. If anything, inmates with these characteristics appear to offend at slightly lower rates in many of the specifications. Table 9 demonstrates evidence consistent with the proposition that the higher security levels are better able to mitigate the effect of higher risk on overall offending levels, though the comparisons for Levels I and II may mitigate this conclusion somewhat. Finally, Table 10 demonstrates very large average differences in placement scores between those inmates who are displaced to lower security levels by mandatory minimums and those who are moved up as a result, with average preliminary scores considerably larger for the former group. In conjunction and based on the reasoning embodied in equation (15R), these patterns suggest that the use of mandatory minimums actually reduces the efficiency of the inmate allocation process.

5. Conclusion

The findings in this study are several. First, as predicted by our simple theoretical model, the use of mandatory minimums for placement in more extreme conditions of confinement opens up wide gaps in average risk scores between inmates constrained by a mandatory minimum to high security placement and inmates assigned to high security placement due to observed risk factors. In our case study, we find that constrained inmates are often much lower risk as measured by the formal assessment than many inmates placed in lower security facilities. Second, we find that those that are

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assign all inmates with positive points to the higher security level and then randomly assign inmates with zero points until the 16,727 spots in Level II are filled. The average preliminary scores in the final two columns are estimates of the average preliminary scores for inmates who would be moved up from the lower security level and inmates who would be moved down from the higher security level if mandatory minimums were abandoned.

placed in high security facilities due to a mandatory minimum are considerably better behaved on average than inmates placed in high security settings due to risk factors. Finally, even among inmates with comparable risk scores that place them above the threshold for high security placement, those with a triggering characteristic for a mandatory minimum are no more likely to offend (and in many instances less likely to offend) than inmates without. These findings strongly suggest that at least in the context studied here, the use of mandatory minimums creates inefficiency in the use of prison resources. That is to say, allocation based on risk scores alone (imperfect as they are) would likely yield lower overall offending and greater criminal incapacitation.

While we have focused specifically on the context of inmate assignment, the findings here raise several questions pertaining to the use of mandatory minimums in sentencing. Long mandatory prison sentences for specific offenses with constraints placed on early release necessarily limits the ability to individualize sentencing and ultimate time served for inmates convicted for statutorily comparable offenses. To the extent that the mandatory minimums reflect legislative intent to be tough on a specific type of offender, it is likely to be the case that the average recidivism risk of those receiving the mandatory minimum and those serving similar prison spells but not sentenced under a mandatory minimum will differ, with the latter being higher risk. In capacity constrained systems, inmates serving long mandatory minimum sentences may displace higher risk inmates and create inefficiency in the use of prison space. Alternatively, systems may simply become overcrowded, leading to deteriorating conditions of confinement, and great expenditure on the incarceration of inmates who would be unlikely (or perhaps less likely) to offend in the community.

To be sure, large general deterrence effects may offset the efficiency loss caused by limiting the ability of judges and parole boards to individualize. To the extent that general deterrence effects are large, it may be the case that on net crime rates are lower with more structured severe sentencing than without. However, there is little evidence to suggest that this is the case. Even in settings with demonstrable general deterrent effects, the additional incarceration costs may outweigh the benefits in terms of crime reduction (see for example the cost-benefit analysis of three-strikes in Helland and Tabarrok 2007). Moreover, in the presence of modest deterrence, there may be more cost-effective interventions for reducing street crime (see for example the analysis in Chalfin and McCrary, *forthcoming*).

There is much need for more research on the effectiveness of mandatory minimums in controlling crime. In the present context we focused on the use of these tools in inmate assignment as we are able to observe official offense records for all inmates within a single system. However, one can imagine several strategies for testing for allocative inefficiency associated with sentencing, given the appropriate data. For example, one could compare the risk profiles of inmates with and without a mandatory minimum sentenced to comparable prison terms (for example, inmates sentenced to five years in the federal system). A test for inefficiency may involve assessing whether the inmates receiving the mandatory five year sentence have less extensive criminal histories than inmates who received five years due to the deliberation of a judge. Alternatively, one could test for an effect of having served a mandatory minimum on recidivism among prison releases holding constant time served. If mandatory minimums over-incarcerate low-risk individuals, we should see lower recidivism rates for these individuals upon release.

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Figure 1: Depiction of the Expected Value of Offending-Risk Profile Assuming Optimal Assignment of the Highest Risk Inmates to High Security Beds

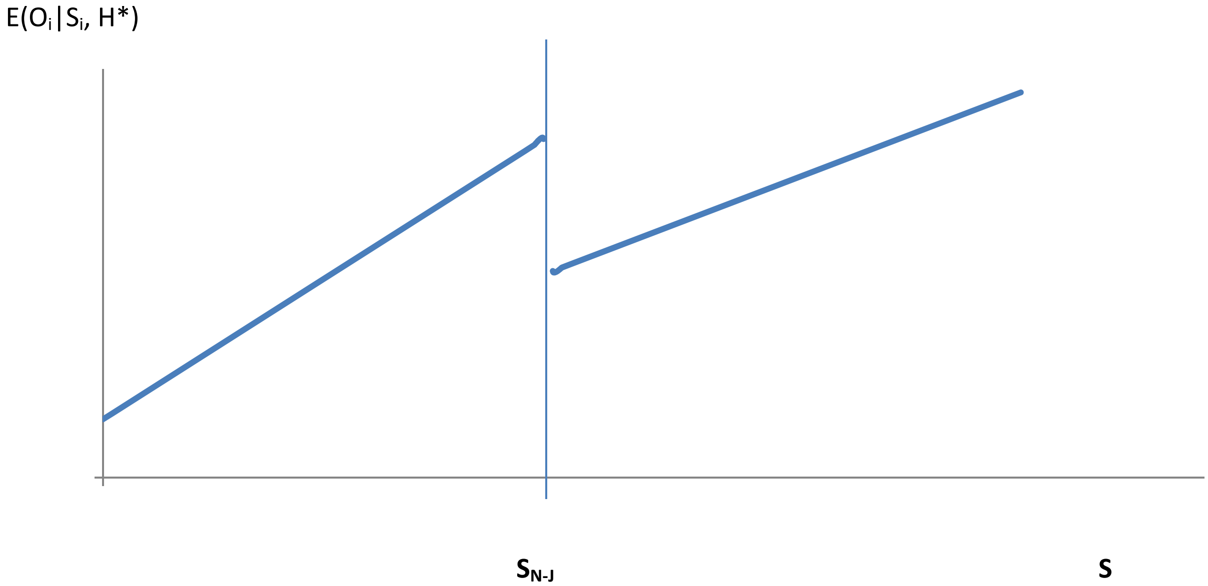


Figure 2: Depiction of the Expected Value of Offending-Risk Profile Assuming H^c=H**

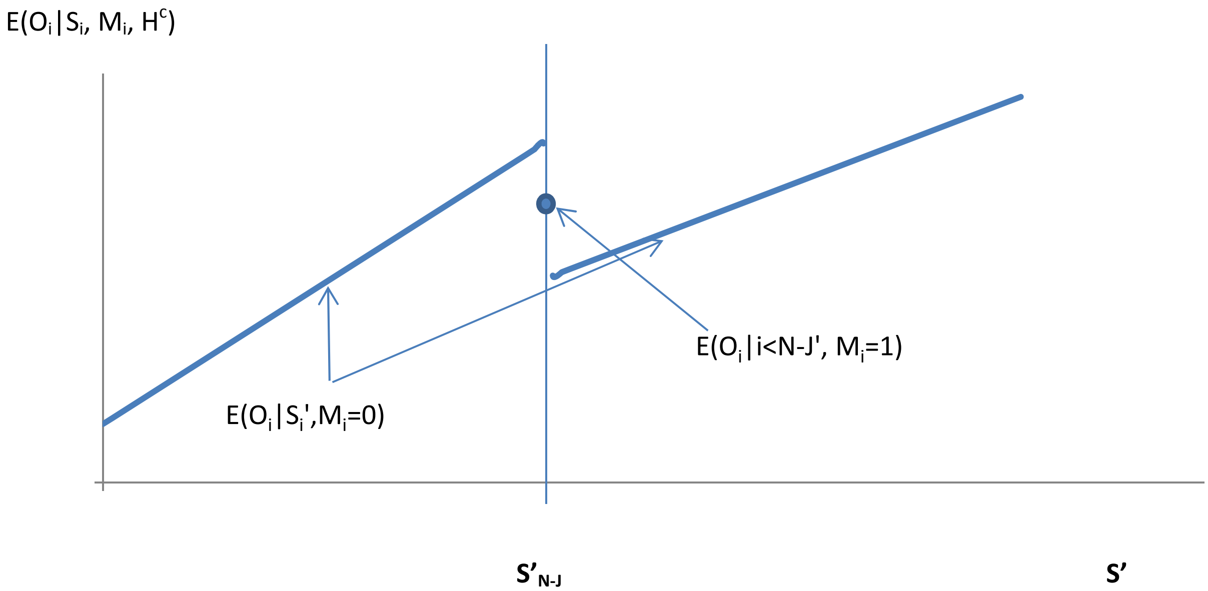


Figure 3: Histogram of Preliminary Scores at the Beginning of the Observed Review Period

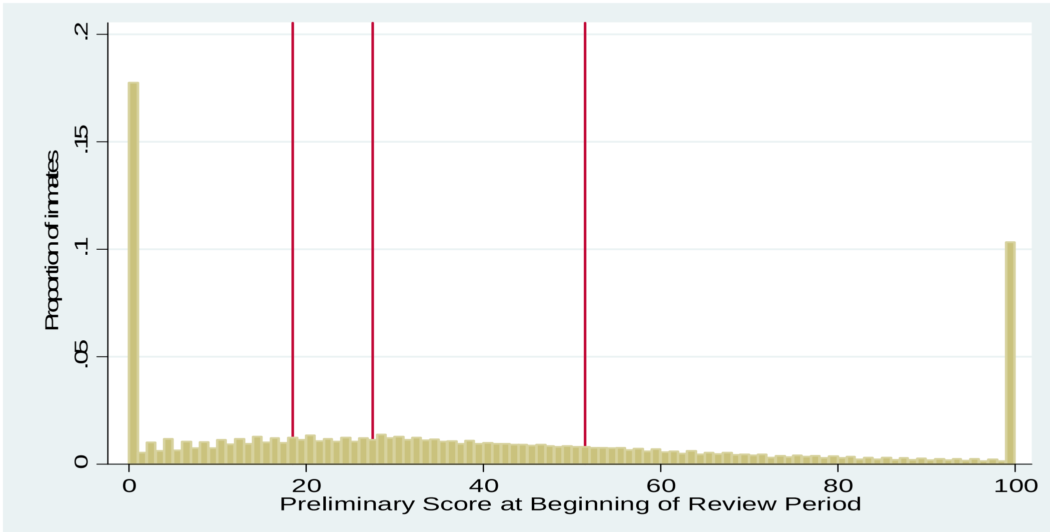


Figure 4: Histogram of Change in Preliminary Score Over the Course of the Observed Review Period

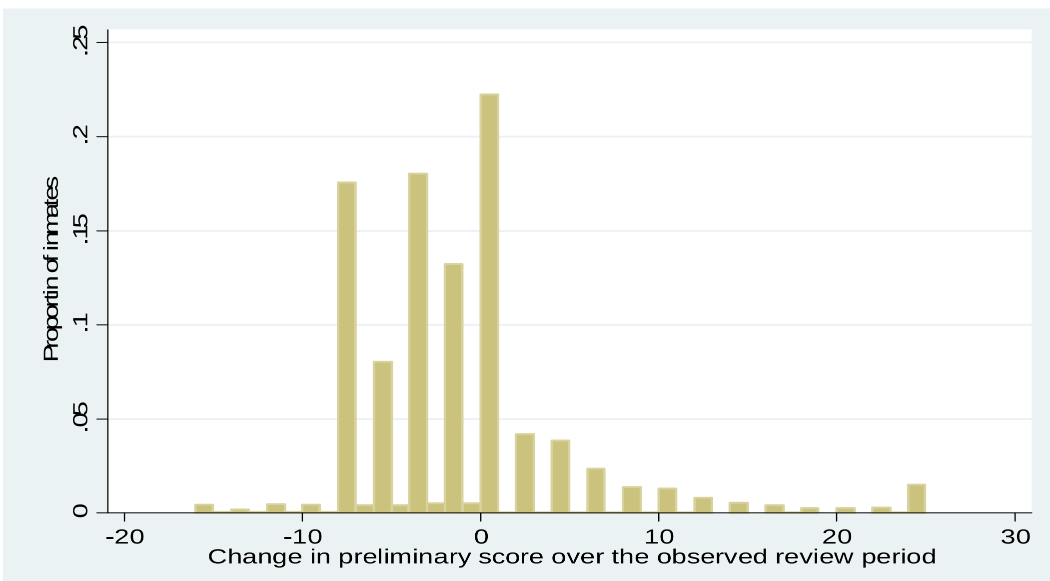


Figure 5: Histogram of Placement Scores at the Beginning of the Review Period

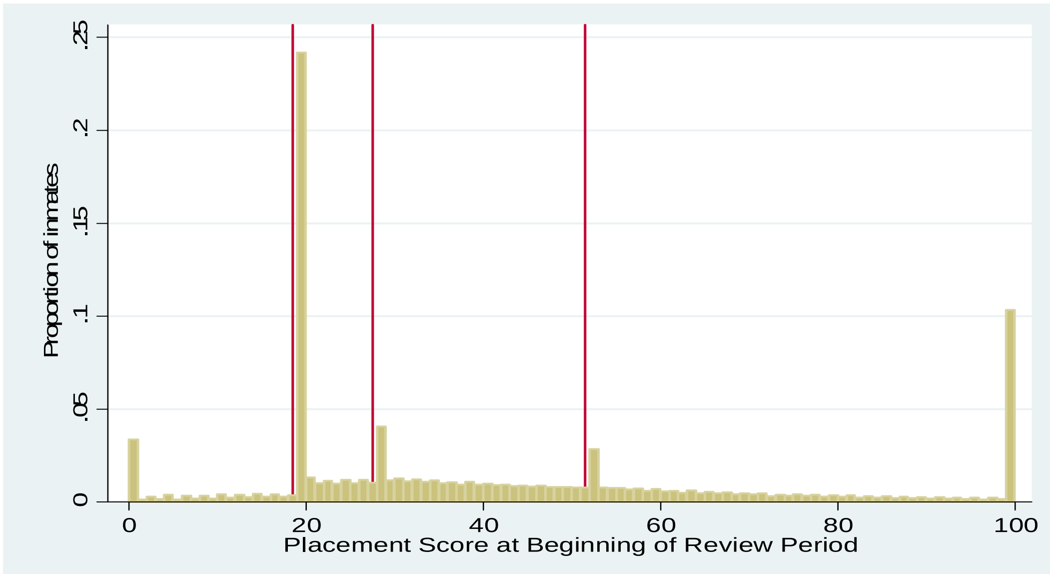


Figure 6: Proportion of the Sample with a Binding Mandatory Minimum Security Placement

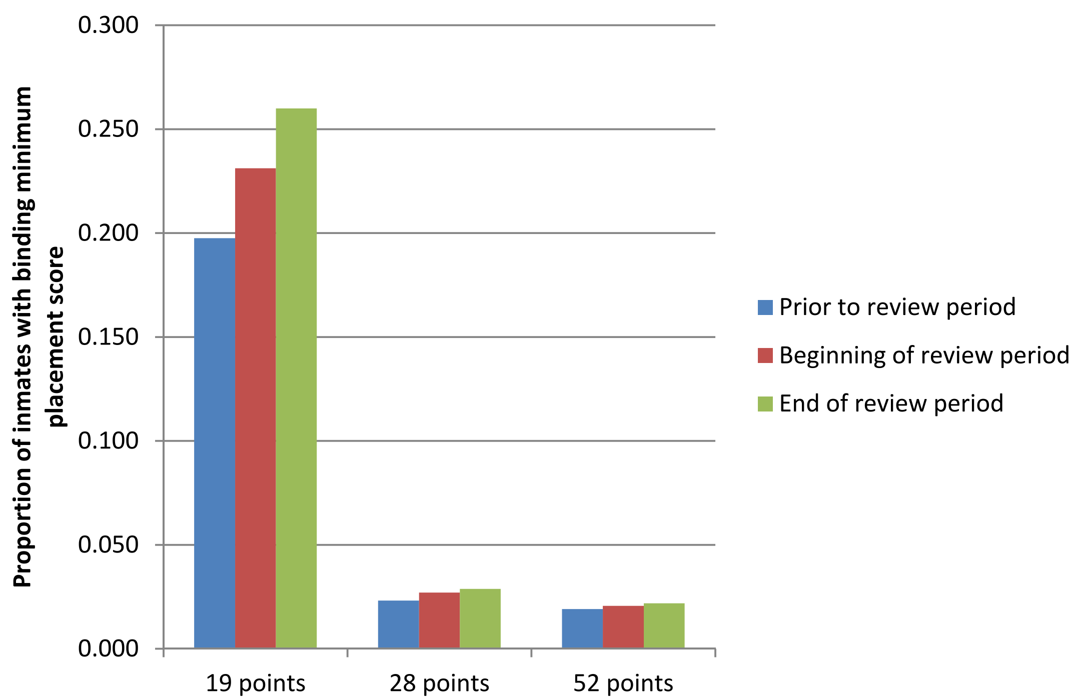


Figure 7: Relationship Between Average Preliminary Score and Average Placement Score for Inmates with Placement Unconstrained by a Mandatory Minimum (solid dots) and Inmates Constrained by a Mandatory Minimum (x's) Based on Score Prior to Beginning of the Review Period

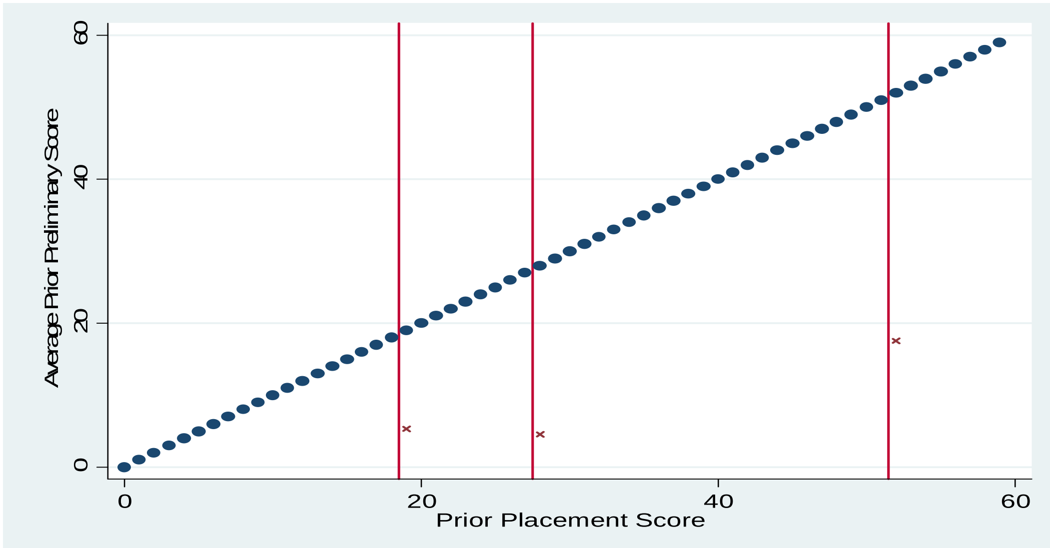


Figure 8: Proportion Housed in Each Security Level by Placement Score Just Prior to the Start of the Review Period

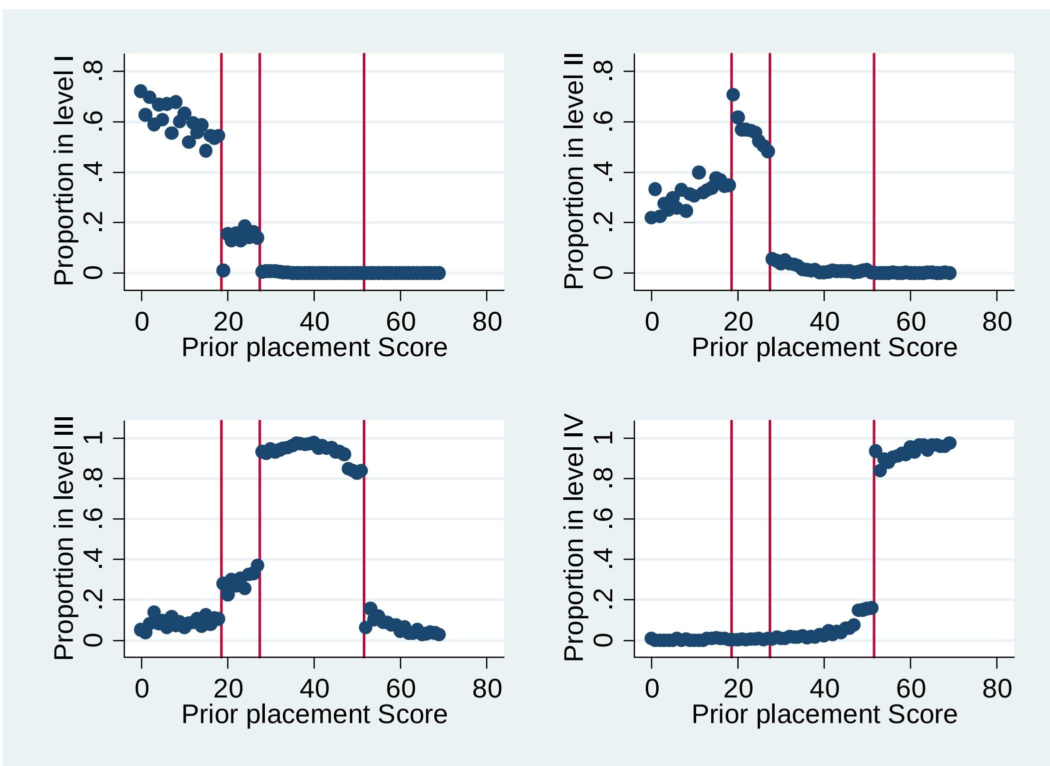


Figure 9: Proportion Housed in Each Security Level by Placement Score Measured at the Start of the Review Period

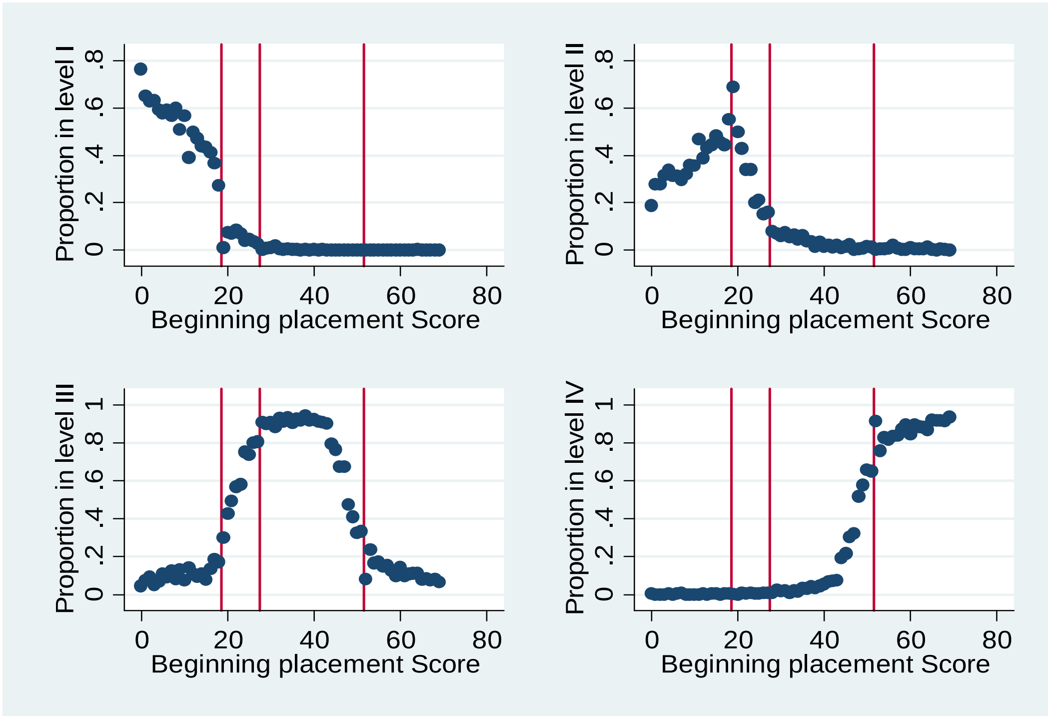


Figure 10: Offending Rates for Inmates Without Binding Mandatory Minimums and Those With (Large Red Dot) Around the Level III/LEVEL IV Cutoff

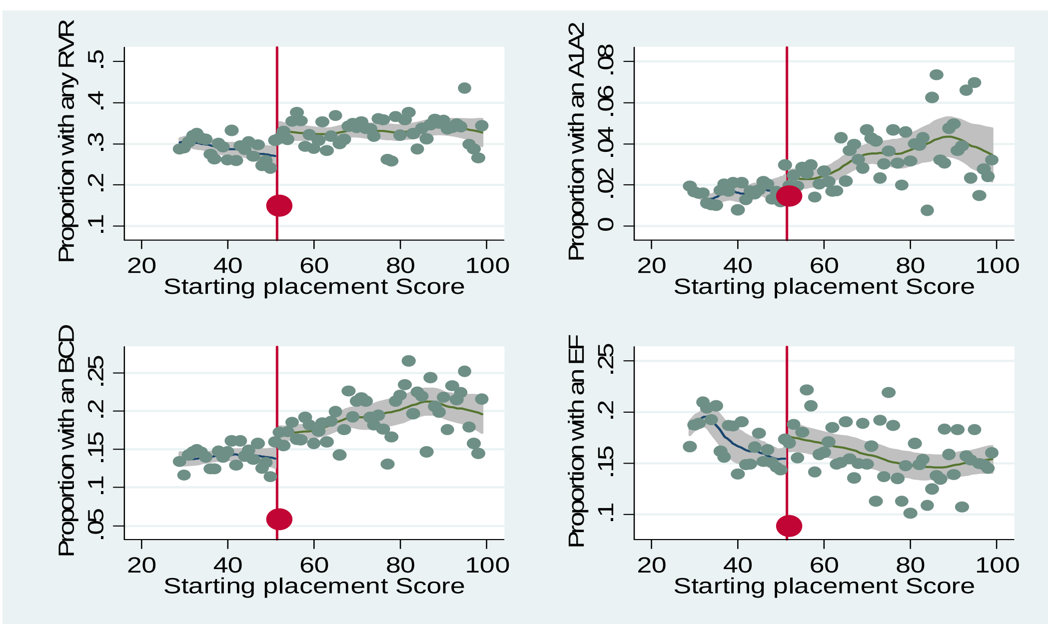


Figure 11: Offending Rates for Inmates Without Binding Mandatory Minimums and Those With (Large Red Dot) Around the Level II/LEVEL III Cutoff

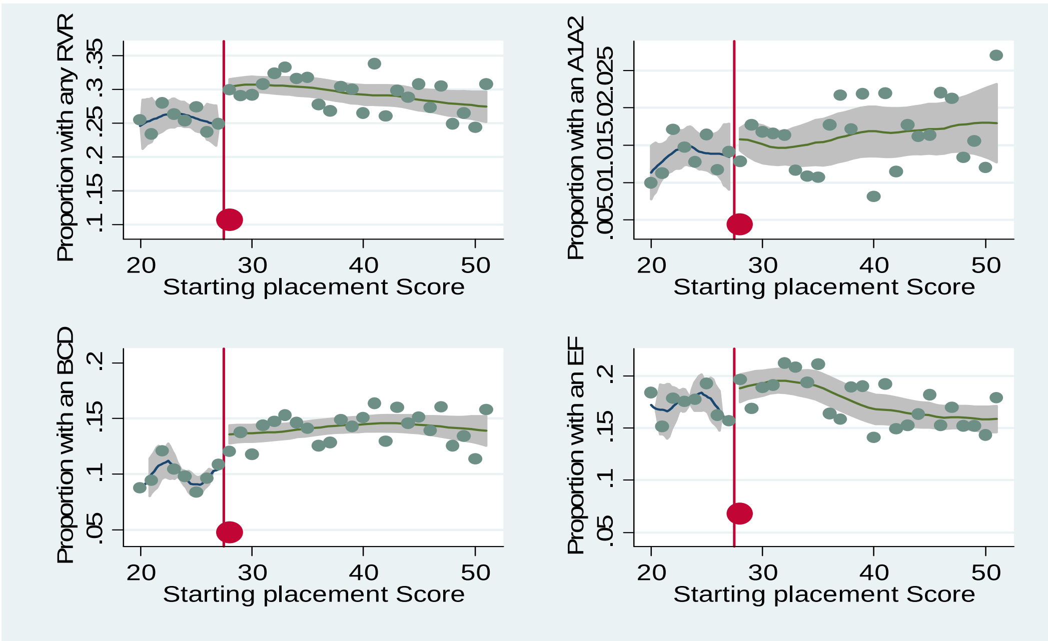


Figure 12: Offending Rates for Inmates Without Binding Mandatory Minimums and Those With (Large Red Dot) Around the Level I/LEVEL II Cutoff

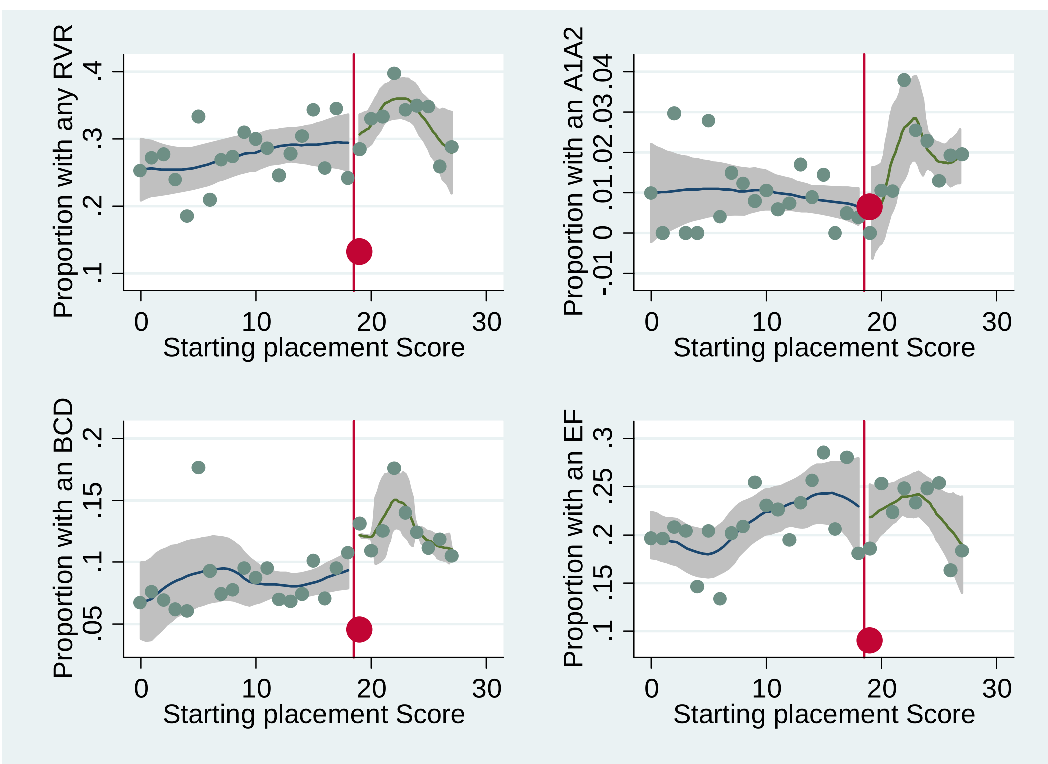


Table 1
Inmate Characteristics that Trigger Mandatory Minimum Points Allocation Along with the Required Minimum Points Level

Triggering Characteristics	Minimum Points
Condemned	52
Life Without Parole (LWOP)	52
CCR 3375.2(a)(7) Life Inmate	28
History of Escape	19
Warrants “R” Suffix (Sex Offender)	19
Violence exclusion	19
Public interest case	19
Other violence	19

Source: CDCR (2011) Table 1.

Table 2
Placement Score Point Ranges By Housing Security Level Along with a Physical Description of the Institutions Circa 2009

Security Level	Placement Point Range	Facility Characteristics
Level I	0 to 18	• Low Security Perimeter like chain link fence • Housing consists of mostly open dormitory facilities and camps
Level II	19 to 27	• Secure perimeter, which may include armed coverage • Housing consists primarily of open dormitories • Average 15 custody staff per 100 inmates • Average 5 violent disciplinary reports per 100 inmates • Average 2 lockdowns per month
Level III	28 to 51	• Secure perimeter with armed coverage • Predominately celled housing, cells may be adjacent to exterior walls • Celled housing units are either 180 or 270 degrees, which refers to the line of sight from a central elevated control booth • Average 18 custody staff per 100 inmates • Average 11.25 violent disciplinary reports per 100 inmates • Average 2 lockdowns per month
Level IV	52 and over	• Secure perimeter with internal and external armed coverage • Cell block housing with cells non-adjacent to exterior walls • Celled housing units are either 180 or 270 degrees, which refers to the line of sight from a central elevated control booth • Average 22 custody staff per 100 inmates • Average 25.8 violent disciplinary reports per 100 inmates • Average 5 lockdowns per month

Note: Features of CDCR facility levels and corresponding placement score values from California Code of Regulations, Title 15. Custody staff averages from COMPSTAT data referenced in Lerman (2013).

Table 3
Key Percentiles of the Preliminary Security Scores Prior to the Observed Review Period, at the Start of the Reserved Review Period, and at the End of the Observed Review Period

	Scores prior to the review period	Scores at the beginning of the review period	Scores at the end of the review period
Proportion zero	0.140	0.177	0.224
Percentiles			
10th	0	0	0
25th	14	9	4
50th	33	31	28
75th	59	58	57
90th	98	100	100
N	79,532	79,555	79,555

Figures are based on all inmates incarcerated for a complete year during FY 2008/2009. We observe the preliminary scores prior to the beginning of the observed review period, the preliminary score resulting from the recertification hearing at the start of the period, and the preliminary score from the recertification hearing those closes the review period.

Table 4
Incidence of Severe Rules Violations Among Regularly Housed Inmates by Institution Security Level

	Example of violation type	Incidence of rules violations			
		Level I	Level II	Level III	Level IV
Any serious rules violation	-	0.309	0.166	0.241	0.308
Type A1/A2 violations	Murder, rape, hostage taking, arson, escape	0.010	0.008	0.013	0.030
Type BCD violations	Battery of an officer, theft>$400, extortion, bribery, poss/manu. of liquor/narcotics, indecent exposure	0.085	0.059	0.111	0.174
Type EF violations	Minor theft, possession, consensual sex, gambling, refusal to work	0.246	0.117	0.147	0.150

Figures pertain to the 65,500 inmates housed in Levels 1 through IV. Inmates in reception centers or other specialty housing are dropped. Examples of violations falling into each category come from §3323 of Title 15 of California Code of Regulations: Crime Prevention and Corrections.

Table 5
Characteristics of Inmates Regularly Housed by Institutional Security Level

	Level I	Level II	Level III	Level IV
Mental health designation				
EOP	0.015	0.019	0.074	0.073
CCCMS	0.042	0.151	0.207	0.231
Age	38.147	43.278	39.067	35.807
Gang member	0.086	0.045	0.172	0.209
First stay	0.313	0.594	0.546	0.575
Offense dist.				
Murder/man	0.013	0.288	0.240	0.429
Robbery	0.212	0.091	0.182	0.198
Assault	0.096	0.131	0.151	0.142
Sex Assault	0.002	0.201	0.152	0.074
Kidnapping	0.001	0.037	0.032	0.029
Burglary	0.128	0.059	0.072	0.047
Larceny	0.069	0.024	0.023	0.011
Vehicle theft	0.045	0.012	0.012	0.008
Forgery/fraud	0.018	0.007	0.005	0.001
Other property	0.007	0.002	0.002	0.001
Drug offense	0.324	0.108	0.092	0.035
Escape	0.000	0.000	0.001	0.001
DUI	0.036	0.009	0.005	0.002
Arson	0.001	0.003	0.003	0.002
Weapons	0.029	0.015	0.020	0.013
Other	0.020	0.015	0.017	0.008
Sentence percentiles (months)				
10^{th}	44	48	60	96
25^{th}	48	72	84	144
50^{th}	72	96	144	204
75^{th}	108	148	192	288
90^{th}	148	228	280	396

Figures pertain to the 65,500 inmates housed in Levels 1 through IV. Inmates in reception centers or other specialty housing are dropped.

Table 6
Estimated Offending Differentials Between Inmates with Constraining Mandatory Minimums and Non-Constrained Inmates with Similar Beginning Placement Scores

Panel A: Inmates with placement scores of 52

Outcome	Explanatory variables	(1)	(2)	(3)	(4)
Any RVR	Min52	-0.161 (0.021)[a]	-0.165 (0.023)[a]	-0.030 (0.029)	-0.016 (0.029)
	Prelim. Score	-	-	0.004 (0.0006)[a]	0.003 (0.0006)[a]
	Age	-	-	-	-0.005 (0.001)[a]
A1A2	Min52	-0.005 (0.006)	-0.002 (0.007)	0.017 (0.009)[c]	0.019 (0.009)[b]
	Prelim. Score	-	-	0.0006 (0.0001)[a]	0.0005 (0.0002)[b]
	Age	-	-	-	-0.0005 (0.0003)[c]
BCD	Min52	-0.113 (0.015)[a]	-0.111 (0.016)[a]	-0.047 (0.021)[b]	-0.042 (0.021)[b]
	Prelim. Score	-	-	0.002 (0.0004)[a]	0.002 (0.0005)[a]
	Age	-	-	-	-0.002 (0.0006)[b]
EF	Min52	-0.081 (0.016)[a]	-0.086 (0.018)[a]	-0.013 (0.024)	-0.004 (0.023)
	Prelim. Score	-	-	0.002 (0.0004)[a]	0.002 (0.0005)[a]
	Age	-	-	-	-0.003 (0.0007)[a]

Panel B: Inmates with placement scores of 28

Outcome	Explanatory variables	(1)	(2)	(3)	(4)
Any RVR	Min28	-0.192 (0.015)[a]	-0.193 (0.015)[a]	-0.044 (0.025)[c]	-0.028 (0.026)
	Prelim. Score	-	-	0.007 (0.001)[a]	0.006 (0.001)[a]
	Age	-	-	-	-0.003 (0.0006)[a]
A1A2	Min28	-0.009 (0.003)[b]	-0.009 (0.004)[a]	0.006 (0.006)	0.006 (0.006)
	Prelim. Score	-	-	0.0007 (0.0002)[a]	0.0007 (0.0002)[a]
	Age	-	-	-	-0.000 (0.000)
BCD	Min28	-0.073 (0.010)[a]	-0.071 (0.010)[a]	-0.007 (0.018)	0.0002 (0.018)
	Prelim. Score	-	-	0.003 (0.0007)[a]	0.002 (0.0007)[a]
	Age	-	-	-	-0.001 (0.0004)[a]
EF	Min28	-0.128 (0.012)[a]	-0.130 (0.013)[a]	-0.044 (0.022)[b]	-0.034 (0.022)
	Prelim. Score	-	-	0.004 (0.0007)[a]	0.003 (0.0008)[a]
	Age	-	-	-	-0.002 (0.0005)[a]

Table 6 Continued

Panel C: Inmates with placement scores of 19

Outcome	Explanatory variables	(1)	(2)	(3)	(4)
Any RVR	Min19	-0.151 (0.023)[a]	-0.071 (0.026)[a]	-0.0004 (0.026)	0.018 (0.026)
	Prelim. Score	-	-	0.006 (0.0004)[a]	0.004 (0.004)[a]
	Age	-	-	-	-0.004 (0.0002)[a]
A1A2	Min19	0.006 (0.005)	0.024 (0.006)[a]	0.026 (0.006)[a]	0.027 (0.006)[a]
	Prelim. Score	-	-	0.0002 (0.0001)[b]	0.0001 (0.0001)
	Age	-	-	-	-0.0002 (0.0001)[a]
BCD	Min19	-0.086 (0.014)[a]	-0.035 (0.016)[b]	-0.006 (0.016)	0.000 (0.016)
	Prelim. Score	-	-	0.002 (0.0002)[a]	0.002 (0.0002)[a]
	Age	-	-	-	-0.001 (0.0001)[a]
EF	Min19	-0.094 (0.019)[a]	-0.048 (0.022)[b]	0.002 (0.022)	0.015 (0.022)
	Prelim. Score	-	-	0.004 (0.0003)[a]	0.003 (0.0003)[a]
	Age	-	-	-	-.003 (0.0002)[a]

Standard errors are in parentheses. Specification (1) is a simple bivariate regression of the violation dummy on a dummy variable indicating a mandatory minimum constraint. Specification (2) adds dummy variables for custody designation, three variable measuring the proportion of the review period in level II, III, and IV institutions, dummies for EOP and CCCMS inmates, and a variable measuring the length in the days of the person specific review period. Specification (3) adds the beginning preliminary score to that of specification (2). Specification (4) adds age.

a. Statistically significant at the one percent level of confidence.

b. Statistically significant at the five percent level of confidence.

c. Statistically significant at the ten percent level of confidence.

Table 7
Estimated Deviation of Offending Levels from the Offending-Placement Score Profile for Inmates With Constraining Mandatory Minimums

Panel A: Inmates with placement scores ranging from 29 to 70			
Outcome Variable	(1)	(2)	(3)
Any RVR	-0.128 (0.016)[a]	-0.128 (0.017)[a]	0.019 (0.027)
A1A2	-0.007 (0.004)	-0.004 (0.004)	0.014 (0.008)[c]
BCD	-0.084 (0.013)[a]	-0.082 (0.013)[a]	-0.007 (0.021)
EF	-0.065 (0.013)[a]	-0.066 (0.014)[a]	0.010 (0.022)
Panel B: Inmates with placement scores ranging from 20 to 51			
Outcome Variable	(1)	(2)	(3)
Any RVR	-0.169 (0.016)[a]	-0.164 (0.015)[a]	0.027 (0.029)
A1A2	-0.008 (0.004)[c]	-0.006 (0.004)	0.009 (0.008)
BCD	-0.065 (0.011)[a]	-0.061 (0.011)[a]	0.022 (0.022)
EF	-0.114 (0.013)	-0.111 (0.013)[a]	0.008 (0.025)
Panel C: Inmates with placement scores ranging from 0 to 27			
Outcome Variable	(1)	(2)	(3)
Any RVR	-0.156 (0.014)[a]	-0.093 (0.015)[a]	-0.007 (0.015)
A1A2	0.003 (0.003)	0.007 (0.004)[b]	0.011 (0.003)[b]
BCD	-0.053 (0.009)[a]	-0.041 (0.009)[a]	-0.007 (0.010)
EF	-0.133 (0.013)[a]	-0.077 (0.013)[a]	-0.014 (0.014)

Standard errors are in parentheses. Figures in the table are the coefficient on the dummy variable indicating a binding mandatory minimum. The basic specification (1) corresponds to equation (15) in the text with no covariate vector X. To reiterate, the basic specification includes a quadratic polynomial of the placement score, a dummy variable for a score over the relevant thresholds, an interaction between the quadratic functions and the threshold, and the dummy indicating an inmate with a binding mandatory minimum. Specification (2) adds three variables for the proportion of review period in each housing security level, dummy variables for custody levels, dummies for EOP and CCCMS inmates, and a control for the length of the review period in days. Specification (3) adds preliminary score and age to specification (2). All models are estimated on samples restricted to the point range indicated in the table, and to inmates who either are not constrained by mandatory minimum in this range, or who are and who have preliminary scores no greater than the dictated mandatory minimum.

a. Statistically significant at the one percent level of confidence.

b. Statistically significant at the five percent level of confidence.

c. Statistically significant t the ten percent level of confidence.

Table 8
Estimates of the Difference in Offending Rates Between Inmates with Non-Binding Mandatory Minimum Designations and Inmates Without Within Housing Security Levels

Panel A: Level IV inmates with 53 to 100 placement points. Figures in panel are estimates of the coefficient on non-binding minimum placement score of 52

	(1)	(2)
Any RVR	-0.030 (0.017)[c]	-0.018 (0.017)
A1A2	0.012 (0.006)[c]	0.005 (0.007)
BCD	-0.012 (0.014)	-0.001 (0.014)
EF	-0.034 (0.013)[a]	-0.024 (0.013)[c]

Panel B: Level III inmates with 29 to 51 placement points. Figures in panel are estimates of the coefficient on non-binding minimum placement score of 28

	(1)	(2)
Any RVR	-0.121 (0.024)[a]	-0.084 (0.023)[a]
A1A2	-0.006 (0.007)	-0.002 (0.007)
BCD	-0.057 (0.018)[a]	-0.041 (0.018)[b]
EF	-0.086 (0.020)[a]	-0.060 (0.02)[a]

Panel C: Level II inmates with 20 to 27 placement points. Figures in panel are estimates of the coefficient on non-binding minimum placement score of 19

	(1)	(2)
Any RVR	-0.059 (0.027)[b]	-0.062 (0.028)[b]
A1A2	-0.019 (0.006)[a]	-0.021 (0.006)[a]
BCD	-0.029 (0.019)	-0.027 (0.020)
EF	-0.053 (0.023)[b]	-0.053 (0.025)[b]

Standard errors are in parentheses. Figures in the table are estimates of the difference in offending between inmates with a non-binding mandatory minimum and inmates without housed in the same security levels. Specification (1) presents results from a simple bivariate regression. Specification (2) adds dummy variables for custody levels, dummies for EOP and CCCMS inmates, a control for the length of the review period in days, and a control for the starting placement score.

a. Statistically significant at the one percent level of confidence.

b. Statistically significant at the five percent level of confidence.

c. Statistically significant at the one percent level of confidence.

Table 9
Marginal Effect of Placement Score on Institutional Misconduct by Housing Security Level from Within-Level Analysis

	Marginal Effect of Placement Score on			
	Any RVR	A1A2	BCD	EF
Level I	0.0048 (0.0014)[a]	-0.0003 (0.0003)	0.0012 (0.0007)[c]	0.0046 (0.0013) [a]
Level II	0.0191 (0.0056)[a]	-0.0022 (0.0012)[c]	0.0083 (0.0040)[b]	0.0185 (0.0049)[a]
Level III	0.0018 (0.0007)[a]	0.0005 (0.0002)[b]	0.0016 (0.0005)[a]	0.0007 (00006)
Level IV	0.0001 (0.0003)	0.0005 (0.0001)[a]	0.0009 (0.0003)[a]	-0.0009 (0.0002)[a]

Standard errors are in parentheses. The coefficients in the table are the coefficients on placement score from the models in specification (2) of Table 8.

a. Statistically significant at the one percent level of confidence.

b. Statistically significant at the five percent level of confidence.

c. Statistically significant at the ten percent level of confidence.

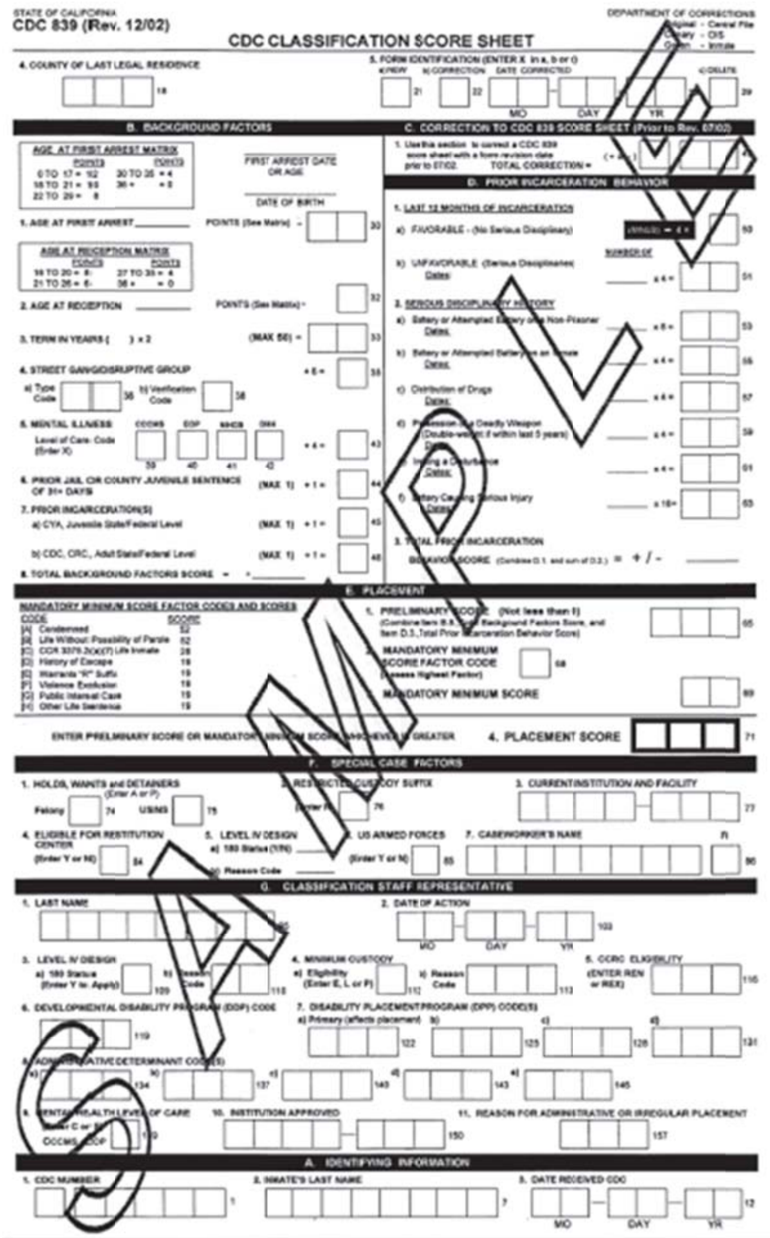
Table 10
Numbers of Inmates with Binding Mandatory Minimums, Number of Inmates Displaced to Lower Security Levels, and Average Preliminary Scores of Inmates Displaced to Lower Security Levels and Inmates Who would be Assigned to Lower Security Levels Absent a Mandatory Minimum

Threshold	# with binding mandatory minimums	# displaced downward by mandatory minimums	Average preliminary score among those displaced downwards	Average preliminary score among those who would be assigned to lower security levels absent mandatory minimums
52 points	1,481	1,394	50.09	14.55
28 points	2,037	1,960	26.11	3.89
19 points	16,727	4,856	8.01	0.00

The numbers with binding mandatory minimums is the number of inmates with placement scores equal to the threshold value and preliminary scores less than the threshold value. The number displaced is the number of inmates in lower security levels who would be moved up a security level if mandatory minimums were abandoned. We calculated this figure by sorting all inmates with preliminary scores below the threshold value and assigning to high security levels the X inmates with the highest preliminary scores, where X equals the number with binding mandatory minimums in reported in the first column. The number displaced is less than the number with binding minimums since some of the inmates with binding minimums and high placement score values would be assigned to the higher security levels even without the mandatory minimums. For the level I/II thresholds, the number with binding minimums is large enough to dip into the population of inmates with zero points. To address this issue, we first assign all inmates with positive points to the higher security level and then randomly assign inmates with zero to the point where the 16,727 spots in level II are filled. The average preliminary scores in the final two columns are estimates of the average preliminary scores for inmates who would be moved up from the lower security level and inmates who would be moved down from the higher security level if mandatory minimums were abandoned.

Appendix A. Sample CDCR Classification Forms

CDCR Form 839 – Sample Inmate Intake Classification Form



STATE OF CALIFORNIA
CDC 839 (Rev. 12/02)
DEPARTMENT OF CORRECTIONS

CDC CLASSIFICATION SCORE SHEET

4. COUNTY OF LAST LEGAL RESIDENCE

5. FORM IDENTIFICATION (ENTER X in a, b or c)

B. BACKGROUND FACTORS

AGE AT FIRST ARREST MATRIX

FIRST ARREST DATE OR AGE

DATE OF BIRTH

1. AGE AT FIRST ARREST

AGE AT RECEPTION MATRIX

2. AGE AT RECEPTION

3. TERM IN YEARS

4. STREET GANG/DISRUPTIVE GROUP

5. MENTAL ILLNESS

6. PRIOR JAIL OR COUNTY JUVENILE SENTENCE OF 31+ DAYS

7. PRIOR INCARCERATION(S)

a) CYA, Juvenile State/Federal Level

b) CDC, CRC, Adult State/Federal Level

8. TOTAL BACKGROUND FACTORS SCORE

C. CORRECTION TO CDC 839 SCORE SHEET (Prior to Rev. 07/02)

TOTAL CORRECTION =

D. PRIOR INCARCERATION BEHAVIOR

1. LAST 12 MONTHS OF INCARCERATION

a) FAVORABLE - (No Serious Disciplinary)

b) UNFAVORABLE (Serious Disciplinaries)

2. SERIOUS DISCIPLINARY HISTORY

a) Battery or Attempted Battery on a Non-Prisoner

b) Battery or Attempted Battery on an Inmate

c) Distribution of Drugs

d) Possession of a Deadly Weapon

f) Battery Causing Serious Injury

3. TOTAL PRIOR INCARCERATION BEHAVIOR SCORE

E. PLACEMENT

MANDATORY MINIMUM SCORE FACTOR CODES AND SCORES

1. PRELIMINARY SCORE (Not less than 1)

MANDATORY MINIMUM SCORE FACTOR CODE

MANDATORY MINIMUM SCORE

ENTER PRELIMINARY SCORE OR MANDATORY MINIMUM SCORE WHICHEVER IS GREATER

4. PLACEMENT SCORE

F. SPECIAL CASE FACTORS

1. HOLDS, WANTS and DETAINERS

3. CURRENT INSTITUTION AND FACILITY

4. ELIGIBLE FOR RESTITUTION CENTER

5. LEVEL IV DESIGN

US ARMED FORCES

7. CASEWORKER'S NAME

G. CLASSIFICATION STAFF REPRESENTATIVE

1. LAST NAME

2. DATE OF ACTION

3. LEVEL IV DESIGN

4. MINIMUM CUSTODY

5. CCRC ELIGIBILITY

6. DEVELOPMENTAL DISABILITY PROGRAM (DDP) CODE

7. DISABILITY PLACEMENT PROGRAM (DPP) CODE(S)

8. ADMINISTRATIVE DETERMINANT CODE(S)

9. MENTAL HEALTH LEVEL OF CARE

10. INSTITUTION APPROVED

11. REASON FOR ADMINISTRATIVE OR IRREGULAR PLACEMENT

A. IDENTIFYING INFORMATION

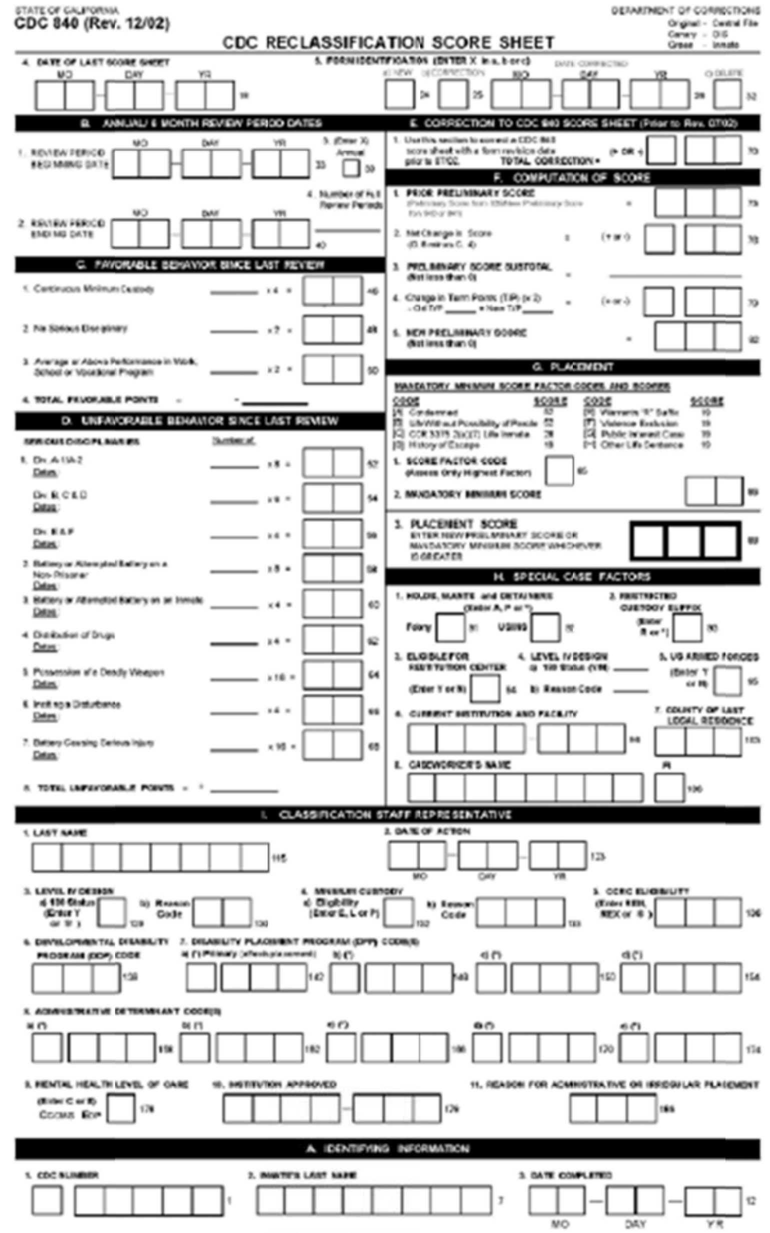
1. CDC NUMBER

2. INMATE'S LAST NAME

3. DATE RECEIVED CDC

SAMPLE

CDCR Form 840 – Sample Inmate Re-classification Form



STATE OF CALIFORNIA
CDC 840 (Rev. 12/02)
DEPARTMENT OF CORRECTIONS

CDC RECLASSIFICATION SCORE SHEET

4. DATE OF LAST SCORE SHEET MO DAY YR
5. FORM IDENTIFICATION (ENTER X in a, b or c) a) NEW b) CORRECTION DATE CORRECTED MO DAY YR c) DELETE

B. ANNUAL/ 6 MONTH REVIEW PERIOD DATES

1. REVIEW PERIOD BEGINNING DATE MO DAY YR
2. REVIEW PERIOD ENDING DATE MO DAY YR
3. (Enter X) Annual
4. Number of Full Review Periods

C. FAVORABLE BEHAVIOR SINCE LAST REVIEW

1. Continuous Minimum Custody
2. No Serious Disciplinary
3. Average or Above Performance in Work, School or Vocational Program
4. TOTAL FAVORABLE POINTS

D. UNFAVORABLE BEHAVIOR SINCE LAST REVIEW

SERIOUS DISCIPLINARIES Number of
1. Div. A-1/A-2 Dates:
Div. B, C & D Dates:
Div. E & F Dates:
2. Battery or Attempted Battery on a Non-Prisoner Dates:
3. Battery or Attempted Battery on an Inmate Dates:
4. Distribution of Drugs Dates:
5. Possession of a Deadly Weapon Dates:
6. Inciting a Disturbance Dates:
7. Battery Causing Serious Injury Dates:
8. TOTAL UNFAVORABLE POINTS

E. CORRECTION TO CDC 840 SCORE SHEET

TOTAL CORRECTION

F. COMPUTATION OF SCORE

1. PRIOR PRELIMINARY SCORE
2. Net Change in Score
3. PRELIMINARY SCORE SUBTOTAL (Not less than 0)
4. Change in Term Points (TIP)
5. NEW PRELIMINARY SCORE (Not less than 0)

G. PLACEMENT

MANDATORY MINIMUM SCORE FACTOR CODES AND SCORES

1. SCORE FACTOR CODE (Assess Only Highest Factor)
2. MANDATORY MINIMUM SCORE
3. PLACEMENT SCORE ENTER NEW PRELIMINARY SCORE OR MANDATORY MINIMUM SCORE WHICHEVER IS GREATER

H. SPECIAL CASE FACTORS

1. HOLDS, WANTS and DETAINERS
2. RESTRICTED CUSTODY SUFFIX
3. ELIGIBLE FOR RESTITUTION CENTER
4. LEVEL IV DESIGN
5. US ARMED FORCES
6. CURRENT INSTITUTION AND FACILITY
7. COUNTY OF LAST LEGAL RESIDENCE
8. CASEWORKER'S NAME

I. CLASSIFICATION STAFF REPRESENTATIVE

1. LAST NAME
2. DATE OF ACTION MO DAY YR
3. LEVEL IV DESIGN
4. MINIMUM CUSTODY
5. CCRC ELIGIBILITY
6. DEVELOPMENTAL DISABILITY PROGRAM (DDP) CODE
7. DISABILITY PLACEMENT PROGRAM (DPP) CODE(S)
8. ADMINISTRATIVE DETERMINANT CODE(S)
9. MENTAL HEALTH LEVEL OF CARE
10. INSTITUTION APPROVED
11. REASON FOR ADMINISTRATIVE OR IRREGULAR PLACEMENT

A. IDENTIFYING INFORMATION

1. CDC NUMBER
2. INMATE'S LAST NAME
3. DATE COMPLETED MO DAY YR