REDUCING INCARCEARTION WHILE MAINTAINING PUBLIC SAFETY

How Do We Reduce Incarceration Rates While Maintaining Public Safety?

Steven Raphael
University of California, Berkeley

The heavy reliance on incarceration in the United States is unusual relative to U.S. history and relative to the use of incarceration in other nations. By now, the facts are common knowledge. We incarcerate our citizens at a rate that exceeds every other nation and that is multiple times (on the order of five to seven) the rates of other high-income countries. Moreover, since the mid-1970s, our incarceration rate has more than quadrupled. Several recent comprehensive studies of the rise of mass incarceration have concluded that nearly all of the growth in U.S. incarceration rates over recent decades can be attributed to changes in sentencing policy that have resulted in a higher propensity to apply prison as punishment and longer effective prison sentences (Raphael and Stoll, 2013; Travis and Western, 2014).

Tonry (2014, this issue) offers a road map for the sentencing reforms that states and the federal government must pursue in some combination to affect substantial declines in the U.S. incarceration rate. The overall proposal is to the point, frank, and enumerates the sentencing practices specifically that drive mass incarceration. In terms of general principles, Tonry argues for a greater degree of proportionality between offense severity and sentence length, the greater individualization of sentencing, and a more systematic approach to sentencing that incorporates capacity constraints and social scientific knowledge on the determinants of offending and reoffending.

Tonry's (2014) proposal calls for the elimination or moderation of sentencing practices that tend to create long sentences for repeat and serious offenders, for example, three-strikes laws, truth-in-sentencing restrictions, life-without-parole sentences, and various mandatory minimums that govern sentencing at the state and federal levels. Such changes in conjunction with the establishment of sentencing commissions shielded from political influence would

Direct correspondence to Steven Raphael, Goldman School of Public Policy, University of California, Berkeley, 2607 Hearst Avenue, Berkeley, CA 94720–7320 (e-mail: stevenraphael@berkeley.edu).

DOI:10.1111/1745-9133.12100

ensure transparent yet practical sentencing that addresses concerns for public safety while achieving retributive goals.

Tonry's (2014) detailed proposal raises several questions pertaining to consequences and political feasibility. Although I will not comment in any detail on the latter issue, I will note that most activists, criminal justice professionals, and informed observers of U.S. corrections policy sense a profound political change and the opening of a policy window where fundamental reform is a real possibility.[1] Setting aside the issue of political feasibility, I will focus my comments on three practical issues raised by Tonry's (2014) road map. First, are the types of sentencing reforms proposed by Tonry the only way to achieve incarceration reductions of the order of magnitude called for by the author? For example, could we achieve such declines by relying solely on reforming drug sentencing, parole policy, or parole revocation practices (reforms that would focus on sentencing practices for less serious offenders)? Similarly, would it be possible to reduce incarceration through additional declines in the crime rate?

Second, Tonry (2014) argues that the effects of such a change on crime would be minimal as research on deterrence and criminal incapacitation finds little evidence of any impact of incarceration on crime. I disagree with this characterization of this body of research yet agree with the contention that a careful selective reduction in incarceration can be achieved with little impact on crime, and that the room for doing so is especially high in the United States.

Finally, although I firmly believe that achieving significant reductions in incarceration requires fundamental sentencing reform, I also believe that the manner in which prison is financed and the decentralization of the process leading to prison admissions and lengthy sentences contributes greatly to over-incarceration in the United States. Hence, I will offer some thoughts on how changing incentives with an eye on increasing the marginal costs of incarceration to counties can be used to bolster the reforms proposed by Tonry (2014) and to incentivize local criminal justice actors to be more deliberating in deciding who to send to state prison.

Model of the U.S. Incarceration Rate

The size of a nation's prison population depends fundamentally on two different sets of rates, or more precisely, transition probabilities. The first is the rate at which we admit

1. Recent years have witnessed several moderations to federal sentencing practices as well as the public pronouncement by U.S. Attorney General Eric Holder that we are over-incarcerating drug offenders in federal prisons. Several states have on their own initiative reduced their prison populations through sentencing, parole, and probation reforms (Raphael and Stoll, 2014), whereas an additional 17 states are in the process of scaling back the use of incarceration through participation in the federal Justice Reinvestment Initiative (LaVigne et al., 2014). Even in California, the state with one of the earliest and harshest three-strikes law enacted through a direct-democracy ballot initiative, voters recently moderated the scope of the law to ensure that offenders do not receive life sentences for less serious offenses.

individuals into state prisons. This prison admissions rate is a function of both individual behavior (in particular, the propensity of the nonincarcerated to commit crime) as well as policing and sentencing policy (the likelihood of being arrested and charged conditional on committing a crime, the probability of being prosecuted, found guilty, and sentenced to prison conditional on a conviction).

The second rate is the rate at which we release the incarcerated from prison. The prison release rate is inversely related to time served. As a rough rule of thumb, the average time served is equal to the reciprocal of the release rate. For example, if half of those doing time for burglary are released each year, then the typical inmate serving time for this offense serves 2 years. Although individual behavior could ultimately impact time served especially for those serving indeterminate sentences, time served and by extension prison release rates are largely a function of sentencing policies and parole practices. For example, mandatory minimums requiring lengthy sentences, repeat offenders statutes that prescribe long prison terms, and truth-in-sentencing laws requiring that inmates serve a minimum amount of their sentences will all increase time served, lower prison release rates, and contribute to higher incarceration rates.

To be sure, there are many prison admission rates and many prison release rates that depend on the offense type and the criminal justice status of the offender. For example, one might distinguish prison admission rates by offense committed for those without an active criminal justice state from the comparable admission rates for offenders on probation or parole. In addition, there are multiple prison release rates that reflect differences in effective sentences associated with offense specifics and the offender's criminal history. Collectively, a given set of admission and release rates are associated with a steady-state incarceration rate. In other words, given sufficient time and stability in the various rates at which we admit and release people to prison, a nation's incarceration rate will eventually settle at a steady and stable rate.

This underlying framework is particularly useful for thinking about (as well as projecting) the effects of policy reforms on incarceration rates. Any policy changes that *permanently* reduce prison admission rates or permanently increase prison release rates (i.e., shorten time served) will decrease the steady-state incarceration rates. Temporary changes in these rates will have only transitory effects on the prison population. For example, the numerous collective pardons and clemencies implemented in Italy since the end of World War II effectively created one-time transitory increases in the prison release rate that predictably led to temporary reductions in the nation's incarceration rate followed by a return to the pre-pardon steady-state levels (Barbarino and Mastrobuoni, 2014; Buonanno and Raphael, 2013).

This framework is useful for thinking about Tonry's (2014) proposal as well as about alternatives to his proposal. Tonry's suggested sentencing reforms focus to a large degree on the release rates (or, equivalently, sentence lengths) for offenders convicted of relatively serious crimes and serving relatively long sentences. One might alternatively target reform

efforts on less serious offenders, such as those convicted of drug offenses or returned to custody for parole violations. Alternatively, one could focus on trying to reduce incarceration by further reducing crime rates (note, higher crime rates directly impact prison populations holding all else constant through the admissions probability). Would such alternative achieve a halving of the U.S. incarceration rate?

Perhaps the least plausible of these alternatives would be to achieve incarceration reductions in the current policy environment through reductions in crime. Crime rates as conventionally measured by the Uniform Crime Report (UCR) data are currently at historical lows, and achieving further reductions could be difficult. Moreover, while there certainly are communities throughout the country with high crime rates, even substantial reductions in overall crime would not have an impact on incarceration of the order of magnitude proposed by Tonry (2014). My colleague Michael Stoll and I performed some simple simulations of the nation's steady-state incarceration rate for 2005 using actual figures for prison admission rates, parole failure rates, and prison release rates for that year to explore this possibility (Raphael and Stoll, 2014). Our simulations suggest that the nation's steady-state incarceration rate was 553 per 100,000 for this year (above the actual rate, but suggesting that absent any policy change incarceration rates should have increase in the subsequent year). To simulate the effects of a 10% and 20% decline in the crime rates, we reduced the prison admission rates for new commitments by 10% and 20% and recalculated the steady-state incarceration rates.[2] A 10% reduction in the crime rate generates a decline in the steady-state incarceration rate for this year to 526 per 100,000. A 20% reduction in crime rates reduces the steady-state incarceration rate to 499. While these declines in incarceration are indeed substantial, they are small relative to the scale of incarceration in the United States.

How about focusing reform on drug offenses and technical parole violations? Certainly, tougher sentences for drug offenders have contributed to growth in the U.S. incarceration rate over the past three decades, especially in the federal prison system. However, tougher drug sentencing, although important, explains a relatively small share of growth in state prison populations. Michael Stoll and I estimated that between 1984 and 2004, tougher drug sentences accounted for approximately one fifth of state prison growth and nearly one half of growth in the federal prison incarceration rate (Raphael and Stoll, 2013).[3] As federal prisoners account for only 13% of the U.S. prison population, the maximum effect

2. Because the prison admission rate equals the crime rate times the likelihood of being admitted conditional on committing a crime, a 10% reduction in crime would lead to a 10% reduction in prison admissions holding all else equal.

3. The simulations behind this calculation roll back admissions rates conditional on arrest and time served to 1984 levels for drug offenders and then simulate the counterfactual overall national steady-state incarceration rate. To be sure, if one were also to roll back drug arrest rates to 1984, the relative importance of drug policy would be larger, perhaps as high as one third. In our analysis, we were interested in particularly placing an upper bound on the possible contribution of higher offending to incarceration and growth, and thus we built in to the simulation exercises assumptions that would bias

of broad drug sentencing reform on the nation's incarceration rate would ultimately be closer to the figures for the state systems than for the federal system. Our estimates suggest that completely rolling back sentencing practices for drug offenders to those of the early 1980s in states throughout the country and in the federal system would reduce the prison population only by approximately 16%. Although this would certainly be a substantial reduction, it falls short of the magnitude of the change advocated by Tonry (2014) and suggests that responsibility for the lion's share of incarceration growth in the United States lies elsewhere. The potential to reduce the nation's incarceration rate through parole reform is even smaller.[4]

By contrast, tougher sentences for violent offenders explain a much larger share of incarceration growth during the prison boom (roughly one half of growth for the population of state prisons). These offenders are targeted by truth-in-sentencing laws and repeat offenders statutes, and perhaps they were most directly impacted by the conversion from indeterminate to determinate sentencing and the subsequent application of outdated statutory maximum sentences, as hypothesized by Tonry (2014). Also, the relative importance of sentencing for violent offenders is readily apparent in cross-state comparisons of high and low incarceration states. For example, Figure 1 presents empirical distribution of offense-specific incarceration rates for 2005 for the 22 states with available data.[5] Although there is substantial variation across states in all of the offense-specific rates, it is clear that the violent crime incarceration rate distribution has the highest mean and variance, and it accounts for an unusually large share of variation in cross-state incarceration rates.[6]

against the overwhelming evidence that changes in sentencing policy explain nearly all of the growth in the U.S. incarceration rate. Because one cannot decompose drug arrest rates into a crime rate and an arrest rate conditional on offending (a decomposition that can be performed for UCR part 1 offenses), we conservatively attribute the entire increase in drug arrest rates to a change in criminal behavior.

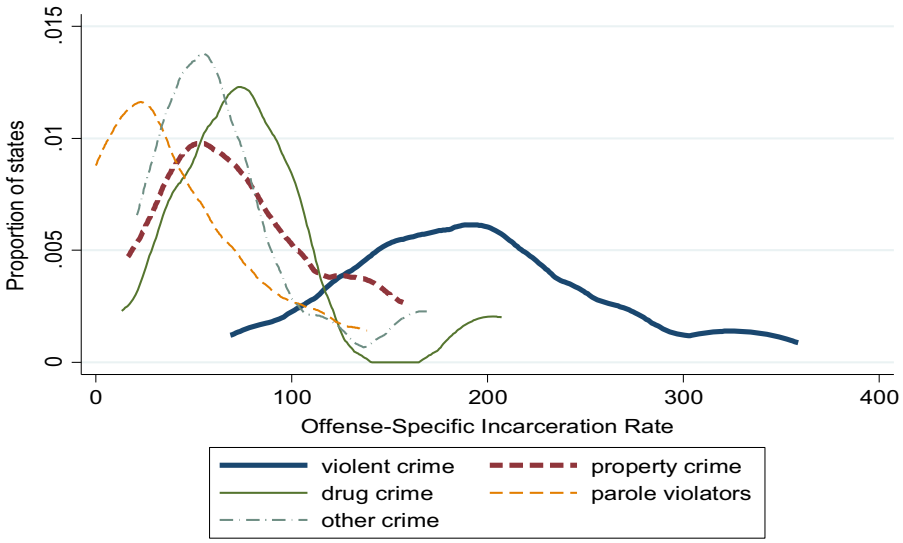
4. Higher parole failure rates and changes in time served for parole violations explain very little of state incarceration growth, and we estimated that rolling back practices to the early 1980s would reduce the overall incarceration by less than 5%. Of course, in some states, parole reform might have substantial impacts on the prison population. Recent reforms in California are a case in point, where a change in parole policy explains much of the recent 17% decline in the state's prison population. The California reforms will be discussed in greater detail in this essay.

5. This figure is based on population stock data by offenses reporting in the National Correctional Reporting Program data for this year. See Chapter 2 in Raphael and Stoll (2013) for a more detailed discussion of cross-state differences in incarceration rates.

6. In Raphael and Stoll (2013), we provided a formal variance decomposition of these cross-state incarceration rates. We found that variability in violent incarceration rates accounts for one fifth of the overall cross-state variance, whereas variation in property crime incarceration, drug crime incarceration, and incarceration for technical parole violations account for 7%, 9%, and 6% of the overall variance, respectively. Interestingly, approximately half of the variance in incarceration rates across states is explained by the positive covariance between incarceration rates for different offenses. In other words, states with tough sentencing policy for one type of crime tend to have tough sentencing practices for all crimes; this uniformity across crime types explains approximately half of the variation across states.

FIGURE 1

Empirical Distributions of the 2005 Offense-Specific Incarceration Rates for the 22 States Reporting Data in the 2005 NCRP



Source. Raphael and Stoll (2013: 55, Figure 2.7).

Tonry's (2013) blueprint for reform is certainly ambitious and focuses largely on offenders who serve long sentences. The truth is that if one wants to reduce prison population substantially, this is where the money is. Offenders that serve long sentences contribute disproportionately to the overall incarceration rate. These offenders tend to be those who have committed more serious crimes and for whom the political obstacles to reducing effective sentence lengths are likely to be the greatest.

Likely Effect of a Substantial Reduction in Incarceration on U.S. Crime Rates

A key issue surrounding all discussions of sentencing reform and reducing prison populations concerns the effect of incarceration on crime. The use of incarceration might impact crime rates through several mechanisms. Removing one from society incapacitates, suppressing criminal activity while incarcerated. The threat of incarceration might deter some from committing crime in the first place. Finally, the experience of incarceration might specifically deter future crime or have a criminogenic impact on prior offenders. One cannot predict a priori which of these effects will dominate and, thus, what the sign of the net effect of marginal changes in incarceration on crime will be. Moreover, considerable evidence suggests that the magnitude and perhaps sign of this net effect changes as the incarceration rate increases.

In my assessment, it is clear that the use of incarceration on average reduces crime. That is to say, the increase in the U.S. prison incarceration rate from roughly 110 to 500 per 100,000 certainly reduced crime rates, and abolishing prisons would certainly increase crime rates. That being said, I believe that strong evidence indicates that the crime-fighting effects of incarceration on the margin are low currently, perhaps even negative, and that there is substantial room to selectively reduce the use of incarceration without having a large impact on crime rates. That is to say, while reducing the incarceration rate back to 1970 levels would likely lead to a substantial increase in crime, reducing incarceration by one fifth, one third, even one half might have limited impacts on crime, especially if resources are reinvested in alternative crime control efforts.

My conclusions are based on two general findings from the research on the incarceration–crime relationship. First, most of the effect of incarceration operates through incapacitation rather than through general deterrence. Second, incapacitation effects decline sharply with increases in incarceration rates, with empirical evidence from the United States and other nations suggesting that diminishing returns begin to set in at very low levels (less than 200 per 100,000).

The first inference follows from the general close correspondence between estimates of the prison–crime relationship based on state panel data analysis and estimates of pure incapacitation effects using alternative research methods.[7] State panel data estimates by design estimate the net effects of changes in state incarceration rates on crime operating through the three mechanisms described previously. As estimates of this net impact often correspond closely with estimates of pure incapacitation effects, this research indicates that most of the impact of incarceration on crime operates through incapacitation.[8]

The second inference follows from panel data research and other studies that assess how the prison–crime effect varies with the incarceration rate. My analysis of state panel data with Rucker Johnson (Johnson and Raphael, 2012), as well as the update of this analysis in Raphael and Stoll (2013), found strong evidence that increases in the prison population in most recent years have generated considerably less crime reduction than increases in years

7. One also might argue that the sharp increase in incarceration caused by tougher sentencing provides evidence of relatively weak general deterrence. A sizable general deterrence effect of tougher sentences could in theory lead to lower incarceration rates if the behavioral response on crime were overwhelmingly large. This clearly has not happened, indicating that despite the much longer prison sentences, people still commit crime.

8. Spelman's (1994, 2000) reviews of early incapacitation research suggested that each incarcerated offender during the 1970s and 1980s prevented 10 to 20 index felony crimes per year. This figure is close to estimates from panel data studies of the overall joint effects of general deterrence and incapacitation associated with changes in incarceration over this period (see Johnson and Raphael, 2012). Owens (2009) provided a more recent estimate of pure incapacitation, suggesting that this effect has declined considerably in more recent years (to one to two property crimes for the marginal offender per year of incarceration). Again, this is comparable in magnitude with more recent estimates from panel data of the joint incapacitation/deterrence effect of prison (Johnson and Raphael, 2012; Liedka, Piehl, and Useem, 2006).

past, with the increase occurring since 1990 being particular ineffective. In the updated analysis, we estimate separate panel data models for three periods: 1977 to 1988, 1989 to 1999, and 2000 to 2010. During the earliest time period, the average state incarceration rate stood at 171 per 100,000. The comparable figures for the latter two time periods are 349 per 100,000 and 449 per 100,000, respectively. To the extent that the crime-fighting effects of incarceration diminish with scale, one would expect weaker impacts of incarceration on crime during the latter periods relative to the earliest period we studied.[9]

The estimates in Raphael and Stoll (2013) indicate that during the late 1970s and early 1980s, each one-person increase in the nation's incarceration rate reduced the annual violent crime rate by between 1.2 and 2 incidents per 100,000 and the annual property crime rate by 9 to 18 incidents per 100,000. In contrast, our estimates of the effects of prison increases on crime during the 1990s and the 2000s are much smaller by comparison. Our research indicates that each one person increase in the incarceration rate lowers the property crime rate between 1.2 and 2 incidents per 100,000. We found little evidence of an effect on violent crime post-1990.

These results are consistent with the analysis presented by Liedka et al. (2006). Using state-level data on crime and incarceration, Liedka et al. analyzed how the overall effect of incarceration on crime varies with the scale of incarceration. Similar to other research on this topic, the authors found significant negative effects of incarceration on crime at low incarceration rates that are substantial in magnitude. However, these effects diminish rapidly with scale. Liedka et al. estimated that somewhere between an incarceration rate of 325 and 425 per 100,000 the effect of incarceration on crime might actually turn positive.

Evidence of diminishing returns can also be found in a comparison of the evaluation results of two recent large exogenous declines in the incarceration rates of Italy and California. On July 31, 2006, the Italian Parliament passed legislation that reduced the sentences of a large proportion of Italian prison inmates convicted prior to May of that year by 3 years effective August 1, 2006, an act principally motivated by the need to address prison overcrowding. The act caused an immediate decline from one month to the next in Italy's incarceration rate from roughly 105 to 66 per 100,000. Over the subsequent 3 years, the incarceration rate returned to the pre-clemency level. The sharp decline in the incarceration rate coincided with a sharp increase in the crime rate. Moreover, the gradual return of the incarceration rate to pre-clemency levels was matched by a gradual decline in crime rates to pre-clemency levels. The magnitude of the increase in crime coinciding

9. The models adjust for bias created by reverse causality via an instrumental variables strategy. Specifically, we use the disparity between actual state incarceration rates and the steady-state rate implied by current admissions and release rates as an instrument for future changes in incarceration. Johnson and Raphael (2012) presented a model and thorough discussion of the conditions under which the proposed instrument identifies exogenous variation in state incarceration rates.

with the mass prisoner release suggests that on average each released inmate generates 14 reported felony crimes per year (Buonanno and Raphael, 2013).[10]

Italy's experience with the 2006 Collective Clemency Bill contrasts sharply with the recent experience of California. Under pressure from a federal court to relieve prison overcrowding, California passed legislation under the banner of corrections realignment in April 2011 with implementation beginning on October 1, 2011. The legislation halted the practice of revoking parolees back to prison for technical violations and diverted many nonserious, nonviolent, nonsexual offenders to jail sentences and sentences to be served via some form of community corrections.

The effect of these reforms on the California prison population did not occur as suddenly as was observed in Italy. However, realignment did result in a relatively quick reduction in the California prison population that was larger in magnitude than that experienced in Italy (in terms of both the numeric reduction in the prison population as well as the decline in the state's incarceration rate). By the end of 2011 (3 months into the implementation of reforms), the prison population declined by approximately 13,000 (an 8% decline). By May 2013, the prison population declined by nearly 28,000 relative to September 2011 (a 17% decline). In terms of incarceration rates, by the end of 2012, California's prison incarceration rate stood at 354 per 100,000, a rate comparable with what existed in 1992 prior to the passage of the state's tough "three-strikes" sentencing reform. This is in comparison to an incarceration rate on the eve of realignment's implementation of 426 per 100,000. The reduction in the state's prison population was partially offset by an increase in the population of county jails of approximately 8,600 inmates (Lofstrom and Raphael, 2013a). However, even accounting for this factor, there were approximately 20,000 additional individuals in noninstitutionalized society who prior to the reform would have been incarcerated.

Magnus Lofstrom and I evaluated the effects of the realignment reforms on California crime rates by comparing crime rate patterns across counties that were differentially impacted by the reforms and by comparing California crime rates with those of states that exhibited similar crime trends to California in the past (Lofstrom and Raphael, 2013b). We found no evidence of an effect of realignment on violent crime and evidence of a modest effect on property crime operating entirely through auto vehicle theft. We estimated that each prison year not served as a result of the reform results in 1.2 additional auto thefts.

I strongly suspect that the contrast in findings between Italy and California is driven entirely by diminishing crime-fighting returns to incarceration. Italy uses incarceration with great parsimony relative to California (compare Italy's pre-pardon incarceration rate of

10. Barbarino and Mastrobuoni (2014) found similar size effects for earlier Italian collective pardons using province-level panel data methods.

105 per 100,000 with California's combined prison-jail incarceration rate[11] of 625 per 100,000 on the eve of realignment's implementation). With such sparing use of incarceration, one would expect the impacts on crime of reducing the incarceration rate in Italy to be much larger than the per-inmate impacts in California, where the criminal justice systems dips much further into the population of convicted offenders. Interestingly, the evaluation of the 2006 Collective Clemency on its own strongly suggests that the incapacitation effect declines rapidly as the incarceration rate increases. In a province-level analysis of the impact of the Collective Clemency act, Paolo Buonanno and I found that provinces with higher pre-pardon incarceration rates experienced small increases in crime associated with the prisoner release, whereas provinces with low incarceration rates experience large increases per inmate released (Buonanno and Raphael, 2013). This is particularly interesting as "high-incarceration" provinces in Italy have incarceration rates below 200 per 100,000.

Hence, although I disagree with Tonry's (2014) characterization of the research on the prison–crime relationship, I generally agree with the proposition that a sizable reduction in the U.S. incarceration rate could be achieved with relatively modest impacts on crime. This, however, is perhaps the wrong way to think about the trade-offs that we face as a society. The preceding discussion suggests that the crime increases of an incarceration reduction would be modest, and if we could cost-out the resultant increase in crime and compare these costs with the benefits from reduced incarceration, the benefits of such a change likely outweigh the costs in terms of higher crime. In other words, some version of Tonry's proposal might pass a cost–benefit test, holding all else constant. However, given the current amount of resources devoted to corrections in the United States, one might alternatively think about the use of prison to control crime in terms of its relative cost-effectiveness.[12]

To be specific, suppose that society wishes to maintain crime rates at a specified level and has at its disposal several policy options for doing so—for example, hiring police, investing in early childhood education, and incarcerating people. Presumably, we would like to achieve our objective (a given low crime rate) in the most efficient manner possible. That is to say, we would strive to employ that mixture of policy interventions that delivers our desired low crime rate at the lowest possible cost, where costs are defined broadly to include both the budgetary outlays as well as the social costs of our policy choices. Let's assume that for each possible policy tool, the marginal benefits of expanding the use of any one tool diminishes with scale. For example, the benefits from hiring additional police officers decline as the police force grows, or as I discussed previously, the crime-preventing benefits of increasing the prison population diminish as the incarceration rate increases.

11. This comparison is appropriate as Italy's incarceration rate includes both the sentenced as well as pretrial incarceration rates.

12. The discussion that follows draws heavily from Raphael and Stoll (2013).

The efficient, or lowest cost, policy strategy would be that for which our various policy tools are employed to the point where the marginal benefit in terms of crimes prevented for each additional dollar spent was equal across all possible interventions. In other words, our policy mixture is efficient when a dollar spent on policing generates the same benefit as an additional dollar spent on prisons or early childhood interventions. To understand why this describes the efficient strategy, suppose that our current policy strategy is inefficient by our definition. Specifically, at our current mixture of policing levels and incarceration expenditures, suppose that the benefit–cost ratio (the "bang-per-buck") associated with additional spending on police is higher than the comparable benefit–cost ratio for additional prison expenditures. Under this scenario, if we were to reduce the prison population and reinvest the savings in more police, then the crime reduction from the additional policing levels would exceed the crime increase caused by the reduction in prison population. On net, crime would decline with the same level of expenditures. Of course, reallocating spending in this manner would push us further down the diminishing-returns path for policing and increase the benefits on the margin from additional prison spending (because by reducing the incarceration rate, the benefits on the margin of additional incarceration spending would increase). In other words, the resource reallocation described earlier would narrow the difference in the benefit–cost ratios of these two interventions. Ideally, we would continue to reallocate resources in this manner until the benefits-per-dollar spent is equalized across these two interventions.

This line of reasoning for thinking about the optimal use of prisons has several implications. First, if the bang-per-buck is not equal across interventions, then we could reallocate expenditures in a manner that would reduce crime without increasing expenditures. Equivalently, when the "bang-per-buck" differs across our alternative interventions, we could achieve the same crime rates at a lower social cost. Our preceding discussion illustrated that we are currently at a point where the benefits on the margin derived from our current high incarceration rate in terms of crime reduction likely fall short of the costs in terms of explicit outlays and difficult-to-price collateral consequences. Hence, one could likely justify a move toward lower incarceration rates even if crime were to increase as a result. However, there is no reason why our public choice should be framed in this manner. We can address crime in ways other than state and federal prisons. To the extent that the bang-per-buck of these alternatives is higher than that associated with recent increases in incarceration, we could reduce incarceration rates, reallocate the freed resources toward other more effective interventions, and have lower incarceration rates without higher crime.[13]

13. Strong evidence shows that the bang-per-buck of additional police spending is high (on the order of $1.60 in reduced crime costs for each additional dollar spent) (see Chalfin and McCrary, 2013). Lofstrom and Raphael (2013b) estimated that the bang-per-buck for prison spending in California is currently much less than one.

Another implication of this line of reasoning is that even if incarceration reduces crime on the margin, it still might be socially desirable to reduce the use of incarceration if this particular policy intervention is not cost-effective relative to other crime control strategies. To illustrate this point, consider the one study that presented compelling evidence of a general deterrent effect of state three-strikes laws. Eric Helland and Alexander Tabarrok (2007) provided a convincing empirical assessment suggestive of enhanced general deterrence resulting from the California law. The authors analyzed the postrelease arrest outcomes of individuals released from California state prisons that vary in terms of the number of prior strikes on their criminal history records as well as the sentences that they face should they reoffend. The authors of the study compared those who have two prior strikes with those who have one prior strike, were charged and tried for a second-strike offense, but were convicted of a less serious felony the second time around that did not result in an increase in the offender's strike count. Helland and Tabarrok (2007) found that within 3 years of release, 40% of those with two strikes on their criminal history record were rearrested compared with 48% of those in the comparison group. This eight-percentage-point differential is highly statistically significant.

If we take as truth the deterrent effects estimated in this study, one can then ask whether controlling crime via three-strikes laws given the magnitude of the general deterrent effect is the optimal strategy to pursue. Helland and Tabarrok (2007) estimated that California's three-strikes law generates costs of $148,000 for each crime prevented. The authors estimated that reallocating the additional expenditures from three-strikes toward policing would have a far larger effect on crime rates than the resultant increase in crime from lighter sentences. Thus, even with a demonstrable deterrent effect, the policy is not particularly cost-effective as we could have greater crime reductions by spending the money elsewhere.

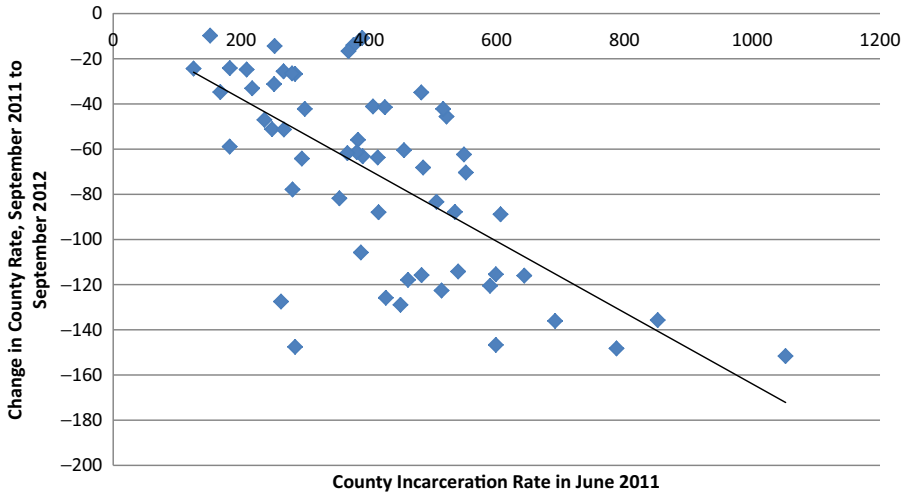
Applying optimization theory to a formal analysis of mass incarceration highlights the importance of alternative crime control strategies and the need to think about reinvesting criminal justice resources toward interventions with higher returns per dollar spent. This reasoning also highlights how even if prisons reduce crime rates on the margin, it might still be optimal to reduce the use of incarceration if more cost-effective alternatives exist.

Changing Incentives Pertaining to the Use of Incarceration

The state of California was recently forced into sentencing reform under the threat of a federal court order to relieve overcrowding in its state prisons. Through greatly curtailing the practice of returning parolees to custody for technical violations and through diversion of nonserious, nonsexual, nonviolent ("triple nons") offenders to local jail or community corrections, the state reduced its prison population by nearly 17% in 1 year. Within California, the realignment reforms shed new light on the great degree to which California's

FIGURE 2

Scatterplot of the Pre–Post Realignment Change in County-Level Prison Incarceration Rates in California Against California County-Level Prison Incarceration Rate in June 2011



Source. Lofstrom and Raphael (2013b, Figure 4).

58 counties varied in their use of the state prison system. Figure 2 presents a scatterplot of the change in county-specific prison incarceration rates over the first year of realignment's implementation (September 2011 to September 2012) against the county's pre-realignment prison incarceration rate (measured as of June 2011).[14] Several patterns stand out in this figure. First, note the great disparities in pre-realignment incarceration rates with the rates across the counties varying from slightly less than 200 per 100,000 to greater than 1,000 per 100,000. Second, note the very large declines in county-level incarceration rates, with a weighted average of roughly 60 per 100,000 across counties but declines as high as 150 in some. Finally, note that those counties with the highest pre-realignment incarceration rates clearly experienced the largest per-capita declines as a result of the reform.

Why were some counties incarcerating residents at five times the rates of other counties? This disparity is in part a result of differences in crime rates. Magnus Lofstrom and I (Lofstrom and Raphael, 2013c) showed that counties in the bottom third of the pre-reform incarceration distribution have violent and property crime rates that are approximately 75% of those for counties in the top third of the incarceration distribution. Counties with

14. The county incarceration rates are measured as the number of county residents per 100,000 incarcerated in any of the state's adult correctional facilities regardless of prison location.

TABLE 1

Cross-County Regression Examining the Correlates of the Pre-Realignment County-Specific Prison Incarceration Rate

Explanatory Variable	Regression Coefficients	25th Percentile of Explanatory Variable	75th Percentile of the Explanatory Variable	Effect on Incarceration Rate of a Variation Equal to the Interquartile Range
Poverty rate, 2006 to 2010	18.24*	10.9	17.5	120.4
	(5.34)			
Percent voting for Proposition 36	−7.11*	60.7	70.9	−72.5
	(2.58)			
Property crime rate 2011	−0.023	1,134.2	1,782.3	−14.9
	(0.050)			
Violent crime rate 2011	0.168	258.2	479.1	37.1
	(0.155)			
R^2	0.463	–	–	–
N	57	–	–	–

Note. Standard errors are in parentheses. The regression is based on 57 of California's 58 counties. We drop Alpine county in Southern California because Alpine does not maintain its own local jail system. Data on county poverty rates come from the Census Bureau American Community Survey. The percentage of county voters supporting proposition 36 comes from the California Secretary of State. Data on property and violent crime for 2011 come from agency level crime counts provided by the California State Attorney General's office.

Source. Lofstrom and Raphael (2013c, Table 2).

*$p < .01$.

higher incarceration rates also have substantially higher poverty rates and likely have a lower per-capita tax base than counties with lower incarceration rates. Finally, counties with high incarceration rates tend to be more conservative and are less supportive of criminal justice reforms that moderate sentencing.

These patterns are summarized with a simple multivariate regression in Table 1. The table reports the coefficient from a regression of pre-realignment incarceration rates on county poverty rates, crime rates, and a variable measuring the proportion of voters supporting the 2012 state Proposition 36, an ultimately successful proposal that limits the scope of third-strike, 25-to-life indeterminate sentences to serious felony crimes. The table also reports the value of each explanatory variable at the 25th and 75th percentile as well as the implied size of the effect of such a variation (the inter-quartile difference) on county prison incarceration rates. Of course, this is clearly a descriptive exercise and there are likely numerous omitted variables in this analysis. Nonetheless, the basic patterns are interesting and revealing. First, once poverty is controlled for, there is no measurable effect of violent and property crime rates. My best guess would be that the poverty rate captures both the underlying criminogenic fundamentals of the county as well as the tax base of the county and the resources available to handle offenders within the community. Second, there is a

strong correlation between the voting behavior of local residents and the pre-realignment incarceration rate, with more conservative counties (those less supportive of Proposition 36) having substantially higher incarceration rates.

These simple patterns suggest that many considerations beyond local criminogenic conditions and even beyond state penal code determine the local use of state prisons. The patterns in Figure 2 suggest that a fair share of the cross-county variation is explained by a differential propensity to incarcerate low-level offenders, as the reforms targeted less serious offenders and incarceration declines the most in counties with high incarceration rates. The patterns in Table 1 suggest that to a substantial degree, county incarceration rates reflect local political preferences and perhaps insufficient resources to deal with low-level offenders locally. What is most fascinating is the fact that these patterns emerge across counties that are essentially operating within the same state penal code.

These patterns for California suggest that many of the sentencing reforms laid out in Tonry's (2014) blueprint could be circumvented at the local level by criminal justice officials responding to the political demands of their offices or perhaps responding to the incentive to pass the cost of such offenders onto the state. The fact that local political preferences result in such large differences in the use of state prisons within the same sentencing structures suggests that there is great discretion and variation in the application of a common penal code, and that localities that lean toward tougher sentencing might continue past practices absent some strong incentive to behave otherwise.

Sentencing reforms targeted at more selective and hopefully efficient use of prison beds would be bolstered by policy changes that better align the incentives faced by counties with the interests of the average taxpayer.[15] Currently, there is a fundamental disconnect between the incentives faced by counties across the country (the main administrative unit that generates prison admissions) and the incentives faced by state governments (the level of government that pays the bill for state prison systems). At the county level, a criminal offender is a nuisance local resident that when convicted and sent off to state prison becomes someone else's problem. The marginal cost of committing an additional inmate is effectively zero, whereas the marginal benefit in terms of criminal incapacitation and savings in policing and monitoring resources can only be positive. Although the prison spell might generate substantial costs for the family and intimates of the convicted offender, and perhaps additional costs for the county when the individual is released from prison, these costs are effectively off the current year's budget. Moreover, these costs likely receive less weight in the decision making of local elected officials. I believe that this incentive structure facilitates the use of sentencing toward political ends and leads to the overincarceration of less serious offenders.

15. The reminder of this section draws heavily from the reforms proposals presented by Raphael and Stoll (2014).

If counties were made to face some portion of the marginal costs generated by each prison admission, then one might expect local officials to be more selective about who is sent to prison and for how long. Indeed, evidence shows that counties can be responsive to both fiscal carrots and sticks. Reform to the California state juvenile justice system provides a vivid example of the latter. In 1996, the state legislature passed a bill that greatly increased the monthly costs for juvenile admissions to the California Youth Authority (CYA), the state agency that at the time ran state juvenile corrections facilities. Prior to this legislation, counties paid $25 per month per CYA ward. Starting in 1997, the monthly payment increased to $150 per month for serious offenders (with severity defined in terms of the commitment offenses). For less serious offenders, counties were required to pay anywhere from 50% to 100% of the custody costs to the state. Subsequent legislation passed in 1998 capped the maximum annual per-ward payment from the counties to $31,200. Nonetheless, for all juvenile commitments, and especially for less serious offenders, the increases in costs to counties created by the reform were substantial. This change caused an immediate and sustained decrease in admissions to CYA beginning in 1997 (Ouss, 2014).

Evidence of responsiveness of counties to positive incentives can be found in the evaluation of the California Community Corrections Performance Incentives Act of 2009 (Administrative Office of the Courts, 2012). The act creates a mechanism by which the state shares with the county any cost savings associated with reductions in incarceration driven by lower rates of probation failures. The county probation department must employ evidence-based community supervision practices and decrease probation failure rates and admission to prison below a benchmark rate measured for the 3-year period preceding the legislation's passage. In the 3 years since implementation, the probation failure rates have declined by 33%.

These policy examples suggest a reform option for reducing incarceration and fostering efficiency in the use of existing prison capacity. A change in policy that ensures that counties have some "skin in the game" is likely to unleash efforts at the local level to be more sparing in the use of incarceration, especially for relatively low-risk offenders. Of course, one would not want to punish poorer counties with an intergovernmental finance structure that charges higher fees to areas with demographics and other local conditions that lead to higher crime rates. However, some creative thinking could certainly generate schemes that better target incentives regarding marginal cases and perhaps combines an implicit tax on counties with a corresponding transfer that leaves county budgets whole while discouraging excessive admissions to the state prisons.

For example, the CYA fee structure in the preceding example nominally increased the cost for the most serious offenders—in other words, the state still paid for those committing the most serious offenses for which diversion to an alternative nonincarceration punishment was simply out of the question. One could imagine a scheme that levied differential tax rates that (a) increased as offense severity (and perhaps the severity of an offender's criminal

history) decreases and (b) increases for offenses in which there is the greatest degree of cross-jurisdiction heterogeneity in the proportion of offenders sent to prison.

Alternatively, one could imagine a block grant combined with an incarceration tax. A state could transfer to each county a fixed amount of state funds for the purposes of criminal justice and safety expenditures to be allocated across potential uses at the locality's discretion. The amount of the block grant could be conditioned on local population, crime rates, and demographics. Pairing the block grant with a per-head annual tax for each person admitted from the county to the state prison system would create an incentive to use prison sparingly. In addition, the block grant structure does not alter the marginal cost of jail admission (i.e., the marginal cost of a local jail inmate would still be positive), as the intergovernmental grant is decoupled from the size of the local correctional population. Moreover, the additional resources in the block grant and the higher relative price of using prison admissions would create incentives for local officials to seek alternative policies that control crime while reducing prison admissions.

An alternative strategy might assign a target incarceration rate to each county based on existing state prison capacity, past crime rates, age structure, and whatever other demographic characteristics are deemed important and legally and ethically appropriate, and it would permit use of the state prison system free of cost within some narrow band around the target. Counties that come in sufficiently below the target could be rewarded with a grant for criminal justice expenditures that increases in the gap relative to the target, whereas counties whose county-specific incarceration rates exceed their targets can be symmetrically taxed. Such a strategy could be particularly effective at identifying the marginal low-risk offenders as counties that overuse the prison system the most relative to a defined benchmark would face the largest tax bill. In other words, achieved reduction in incarceration would be generated largely by reductions in incarceration for outlier counties with unusually high incarceration rates.

This solution has much room for policy experimentation. Currently, incentives are designed to generate too many admissions to prison. Moreover, local officials are sensitive to cost incentives. This should be harnessed in fostering a more humane and cost-effective crime control policy.

Conclusion

Tonry (2014) clearly and succinctly identifies the sentencing practices that must change if we wish to bring down the nation's incarceration rate. Many of these changes, although likely reducing time served during the period when the offenders have aged out of crime, would impact individuals who have committed serious offenses. The political challenges to such changes are likely to be considerable. Nonetheless, reforms that incorporate formal risk assessment and careful deliberation might be able to overcome these challenges.

Although many people in prison would be offending if they were on the street, our high incarceration rate creates room for a selective retreat from mass incarceration that

would not compromise public safety. Moreover, given the amount of resources devoted to corrections across the country, the savings from reducing the extensive and intensive use of prisons could be reallocated toward other policy levers designed to fight crime. Our current policy mixture is not optimal, and fairly strong empirical evidence suggests that the benefit–cost ratio of marginal investments in alternative nonincarceration policy tools (policing and human capital investments, in particular) exceeds the benefit–cost ratio of subsequent increases in the prison population.

Finally, sentencing reforms are much needed. However, policy attention should also focus on incentives in the criminal justice system and ensure that the current structure generating admissions to prison and long sentences is not encouraged via parochial cost incentives toward overusing this costly social institution.

References

Administrative Office of the Courts. 2012. *SB 678 Year 2 Report: Implementation of the California Community Corrections Performance Incentives Act of 2009*. San Francisco, CA: Author.

Barbarino, Alessandro and Giovanni Mastrobuoni. 2014. The incapacitation effect of incarceration: Evidence from several Italian collective pardons. *American Economic Journal: Economic Policy*, 6: 1–37.

Buonanno, Paolo and Steven Raphael. 2013. Incarceration and incapacitation: Evidence from the 2006 Italian Collective Pardon. *American Economic Review*, 103(6): 2437–2465.

Chalfin, Aaron and Justin McCrary. 2013. *Are U.S. Cities Under-Policed? Theory and Evidence*. Working paper, University of California, Berkeley.

Helland, Eric and Alexander Tabarrok. 2007. Does three strikes deter? A nonparametric estimation. *Journal of Human Resources*, 42: 300–330.

Johnson, Rucker and Steven Raphael. 2012. How much crime reduction does the marginal prisoner buy? *Journal of Law and Economics*, 55: 275–310.

LaVigne, Nancy, Samuel Bieler, Lindsey Cramer, Helen Ho, Cybele Kotonias, Deborah Mayer, et al. 2014. *Justice Reinvestment Initiative State Assessment Report*. Washington, DC: The Urban Institute.

Liedka, Raymond, Anne Morrison Piehl, and Bert Useem. 2006. The crime control effect of incarceration: Does scale matter? *Criminology & Public Policy*, 5: 245–275.

Lofstrom, Magnus and Steven Raphael. 2013a. *Impact of Realignment on California Jail Populations*. San Francisco: Public Policy Institute of California.

Lofstrom, Magnus and Steven Raphael. 2013b. *Public Safety Realignment and Crime Rates in California*. San Francisco: Public Policy Institute of California.

Lofstrom, Magnus and Steven Raphael. 2013c. *Incarceration and Crime: Evidence from California's Public Safety Realignment*. IZA Working Paper #7838.

Ouss, Aurélie. 2014. *Incentive Structure and Criminal Justice*. Working paper, University of Chicago, Chicago, IL.

Owens, Emily G. 2009. More time, less crime? Estimating the incapacitative effects of sentence enhancements. *Journal of Law & Economics*, 52: 551–579.

Raphael, Steven and Michael Stoll. 2013. *Why Are So Many Americans in Prison*? New York: Russell Sage Foundation.

Raphael, Steven and Michael Stoll. 2014. *A New Approach to Reducing Incarceration While Maintaining Low Rates of Crime*. Washington, DC: The Brookings Institution.

Spelman, William. 1994. *Criminal Incapacitation*. New York: Plenum Press.

Spelman, William. 2000. The limited importance of prison expansion. In (Alfred Blumstein and Joel Wallman, eds.), *The Crime Drop in America*. Cambridge, U.K.: Cambridge University Press.

Tonry, Michael. 2014. Remodeling American sentencing: A ten-step blueprint for moving past incarceration. *Criminology & Public Policy*, 13:503–533.

Travis, Jeremy and Bruce Western. 2014. *The Growth of Incarceration in the United States: Exploring Causes and Consequences*. Washington, DC: National Academies Press.

Steven Raphael is professor of public policy at the Goldman School of Public Policy at the University of California Berkeley.