



INCARCERATION AND CRIME: LESSONS FROM CALIFORNIA'S PUBLIC SAFETY REALIGNMENT REFORM

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Introduction

The use of incarceration as a tool to protect public safety varies substantially across countries. While in most European countries the incarceration rate is below 150 per 100,000 residents, and well below 100 in countries like Germany, the Netherlands and Sweden; the US, with roughly 2.2 million people currently in the nation's prisons or jails, incarcerate more people than any other country. With dramatic growth over the last three decades, the US incarceration rate now stands at more than 700 per 100,000 residents. A key question for policy-makers in the US and elsewhere is; what is the crime preventive effect of incarceration?

The relationship between incarceration and crime is driven by three primary causal channels: firstly, prisons incapacitate the criminally active; secondly, the threat of prison may deter criminal activity; and finally, prison may be transformative, either through rehabilitation or through a hardening of prison inmates, factors likely to alter future offending by former prison inmates. While the first two factors theoretically induce a contemporaneous negative relationship between criminal offending and incarceration levels, the latter channel probably induces a distributed lagged effect of incarceration on crime that can be either positive or negative.

In this paper, we present recent findings based on perhaps the largest exogenous decline in a state's incarceration rate in US history on local crime rates.³ We

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³ For a more detailed discussion of the findings presented here, see Lofstrom and Raphael (2013b), available at <http://www.ppic.org/main/publication.asp?i=1075>.

present and discuss the effects of a recent reform in California that caused a sharp and permanent reduction in the state's incarceration rate. These findings can be described as approximating the causal incapacitation effect of incarceration on crime. We also put the findings in the context of the existing literature and present some basic cost benefit analysis of incarceration.

California's public safety realignment reform

The 2011 legislation commonly referred to as public safety realignment (or AB 109) caused a substantial reduction in the population of California's overcrowded and expensive prison system. The reforms were forced by a federal court order to reduce the prison population; an order challenged by the state and upheld by the US Supreme Court in May 2011. With prison expenditure consuming ten percent of the state budget (more than doubling since the mid-1980s), and severe declines in state revenues caused by the Great Recession, the state was in no position to relieve overcrowding through new prison construction.

Realignment sought to reduce the prison population by reducing the rate at which parolees return to state custody and by sentencing lower-level offenders to county jails, rather than prison. The legislation transferred substantial responsibilities for monitoring paroled inmates and punishing lower-level offenders, from the state to its 58 counties. These new responsibilities also came with additional funding from the state and greater discretion for localities to decide how to implement realignment. The reforms went into effect on October 1, 2011 and quickly decreased the prison incarceration rate to a level not seen since the early 1990s. Although county jails absorbed many of the offenders affected by the legislation, recent analysis quite clearly shows that realignment markedly decreased the overall reliance on incarceration in California. Lofstrom and Raphael (2013a) show that on average, a county's jail population increases by one for every three felons no longer assigned to state prison. As realignment has caused a decline in the prison population of roughly 27,000, this translates into approximately 18,000 additional individuals in non-in-

stitutionalized settings who, in previous years, would have been either in prison or a local jail.

This large increase in “street-time” among former prison inmates raises obvious concerns over whether realignment has caused an increase in state crime rates. There are multiple avenues through which such a crime effect may occur. To the extent that prison incapacitates the criminally active by limiting “street-time”, reducing the prison population may increase crime through reversing this incapacitation effect. Moreover, to the extent that potential offenders perceive a reduction in the severity of the punishment that they would receive if caught, the deterrent effect associated with the threat of prison may have been diminished. Moreover, this diminishing of the deterrence effect may be larger in localities where incarceration rates drop the most.

There are reasons to believe, however, that the effects of realignment on crime are likely to be small. Firstly, prior research on criminal incapacitation, or reduced “street-time”, has shown that this effect varies considerably from inmate to inmate. Moreover, with the large increase in incarceration rates in the United States over the past three decades (with California charting pretty close to the national average), the average incapacitation effect has declined considerably as we incarcerate older and less serious offenders – that is to say, the crime-reducing benefits of incarceration are subject to diminishing returns to scale. Prior research on criminal incapacitation finds that diminishing crime-fighting returns set in at quite low levels of incarceration, with very small effects at the levels currently characterizing most US states, including California. As realignment was targeted at reducing the use of state prison for less serious felonies and for less serious violations (specifically, parole violations not involving a new felony), one may predict that the reverse incapacitation effect is likely to be modest.

Using California’s reform to estimate crime effects

Any empirical study of the effects of the reform must be able to rule out the potential impacts of confounding factors that may be coincidentally impacting crime rates in California and other states, yet have nothing to do with the realignment reforms. Our empirical strategy makes use of the fact that the impact of realignment on county-specific incarceration rates varies considerably across counties. To be specific, counties that had very high pre-realignment incarceration rates (defined as the

number of county residents in a state prison per 100,000 county residents) experienced the largest decreases in county-specific incarceration rates, and by extension, increases in the number of former inmates in their communities (Lofstrom and Raphael 2013a). Our empirical strategy essentially assesses whether crime rates increase more in counties that experience relatively large decreases in their county incarceration rates.

More specifically, using county level data on crime rates, prison incarceration rates, and jail incarceration rates, we measure changes in these three factors relative to the pre-realignment period for each month from October 2011 through September 2012 (effectively, the first twelve months following the reform). We adjust these change measures for county-specific seasonal patterns in crime and incarceration to make sure that cross-county differences in crime-seasonality that happen to coincide with the geographic distribution of realigned inmates are not biasing our results. Our estimates exploit the fact that there is substantial variation both within and between counties in the effects of realignment on the rates at which county residents are incarcerated. Hence, we can assess whether crime rates increase within a county as the number of realigned offenders residing within the county increases. We can also assess whether crime rates increase by relatively larger amounts in counties that experience relatively large increases in the number of former inmates residing in their communities.

Our preferred empirical estimates statistically control for three broad factors. Firstly, all of our estimates control at the county level for changes in the jail incarceration rate. As we ultimately seek to estimate the increase in crime rates for each one-person decrease in the rate at which county residents are incarcerated, we must be sure to control for any re-incarceration occurring at the county level through the jail systems.

Secondly, we adjust for broad county-specific trends coinciding with the implementation of realignment. There are a number of factors that may influence crime rates differentially across counties that may coincide with the number of realigned offenders, yet have nothing to do with the reform. One such potential factor is changes in the number of police officers. Many police departments have seen cuts to their staff in recent years, potentially exerting an upward pressure on crime trends. If the decline in the number of police officers coincides with the changes in incarceration, such a factor may lead to biased estimates of the crime effects of realignment.

Alternatively, the speed of the economic recovery may vary across counties, with counties experiencing slower recoveries perhaps having larger increases in crime in 2012. Allowing for county-specific trends in changes in crime and incarceration allows us to control for many such possibilities.

Thirdly, we control for the overall statewide trends in crime and incarceration rates. Since we observe substantial variation within counties over the course of the first post-realignment year, we are able to see whether counties that experience declines in their incarceration rate in excess of what happens on average, for a given month, also experience increases in crime that are in excess of what is observed on average for a given month. A look at cross-state trends reveals recent increases in crime, especially violent crime, in a number of other states throughout the country (Lofstrom and Raphael 2013b). This third set of control variables effectively adjusts for this broad trend.

One might contend that purging the data of the overall state-level trends may effectively throw out any general deterrent effects caused by realignment that are impacting crime statewide. To the extent that this is the case, our estimates controlling for state trends may be underestimating the effects of realigned offenders on crime. However, prior research on the prison-crime relationship has found that nearly all of the contemporaneous impact of prison on crime operates through incapacitation (see in particular, the discussion in Buonanno and Raphael 2013 and Raphael and Stoll 2013). Moreover, the violent crime trends in neighboring states strongly suggest the need for such controls. Finally, the estimated crime effects for the offense for which we see the strongest evidence of an effect of realignment (motor vehicle theft) exhibits little sensitivity to this control, suggesting that true realignment-induced impacts survive this statistical trend adjustment.

Our preferred estimates are those that adjust for all three factors discussed here. However, see Lofstrom and Raphael (2013b) for results from alternative empirical strategies which allow readers to view the sensitivity of the results to various specification choices.

We should note from the outset that the approach described above provides an estimate of the effect of realignment-induced changes in incarceration on crime rates, and that these estimates may differ from what one might expect from similar-sized reductions in other states or countries. There is a large body of research as-

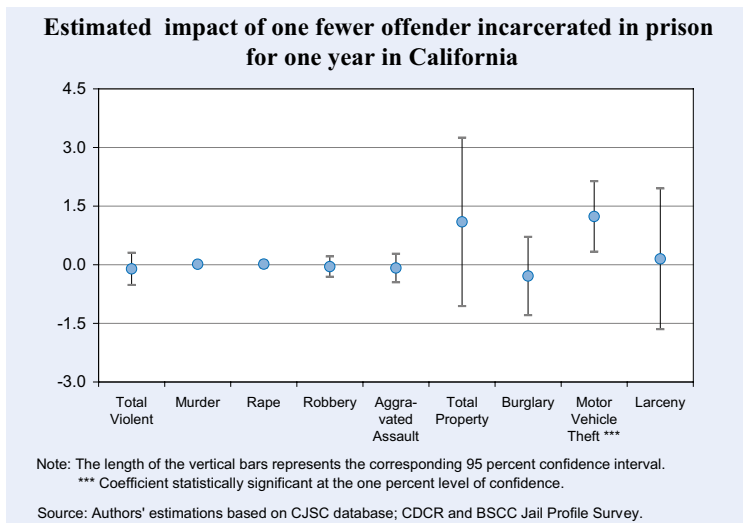
sessing the effects of changes in incarceration on crime that tends to find that incarcerating a convicted criminal offender does, on average, reduce crime through incapacitation (essentially reduced “street-time”) and deterrence, with the lion’s share of the reduction operating through incapacitation. However, this research also documents a decreasing crime-prison effect as incarceration rates increase (what economists refer to as a “diminishing returns to scale”) at quite low levels of incarceration, and very small crime effects at the incarceration rates that currently characterize most US states, including California. Hence, the results presented here should be interpreted as the effects of a change in the incarceration rate on crime for a system with a pre-change rate hovering around 425 per 100,000 (roughly speaking, California’s rate prior to September 2011).

California’s reform had limited and modest effects on crime

The estimates generated using our preferred model specification can easily be summarized in Figure 1, which is to be interpreted as follows. For each crime, the blue dot provides our estimate of the amount of crime committed by the average realigned inmate over the course of a year, or alternatively stated, the amount of crime prevented by incarcerating the person for a full year. The black bars extending upwards and downwards span the margin of error of our estimate. When the bars cross the zero line along the vertical axis, this indicates that the estimate is not statistically significant (that is to say, a value of zero is within our margin of error). On the other hand, when the range of the bars lies above the zero value measured on the vertical axis, the estimate is statistically significant.

These estimates reveal no evidence of an impact of realignment on violent crime. All of the estimates are near zero, quite precisely estimated and statistically insignificant. The estimates for property crime suggest a crime effect of 1.1 incidents per year of incarceration. When property crime is broken down into larceny theft, burglary and auto theft, the results show no statistically significant effect on the two former categories of property crime. However, the estimate for motor vehicle theft is statistically significant. One year of prison incarceration prevents approximately 1.2 motor vehicle thefts. In other words, in the context of California’s reform, incarceration has a limited crime preventive effect and only an increase in auto thefts can be attributed to the large scale reform. These findings are corroborated in an

Figure 1



analysis of statewide crime trends to determine whether California's post-reform changes in crime rates stand out compared to states with similar pre-reform crime trends (Lofstrom and Raphael 2013b).

Putting the findings in relevant contexts

As discussed above, we find little evidence that the reductions in the state's prison population caused by realignment increased violent crime. However, we find robust evidence of a modest effect on property crime, especially motor vehicle thefts. Specifically, we estimate an average increase of about 1.2 auto thefts for each realigned inmate per year of time not incarcerated in a state prison.

Is this effect on property crime large? There are a number of ways to answer this question. Firstly, we can compare our results to those from previous research. Secondly, we can ask whether the value of the crimes prevented justifies the expenses associated with incarcerating someone for a full year. Thirdly, we can explore whether there are other crime-control strategies that would yield crime reductions at lower costs.

The California estimates are consistent with existing research

Regarding results from previous research, the speed and size of the reduction in California's incarceration rate is unprecedented in the United States, and thus it is impossible to find a comparable evaluation conduct-

ed within the United States. There is, however, a relevant example from another country. On July 31, 2006, the Italian Parliament passed legislation that reduced the sentences of most Italian prison inmates by three years effective as of August 1, 2006. The clemency applied only to inmates convicted of a subset of felonies committed prior to May of that year. The passage of the Collective Clemency bill followed a six-year debate surrounding Italian prison conditions, spurred in large part by the activism of the Catholic Church and the personal involvement of Pope John Paul II. With Italian prisons filled to 130 percent of capacity, the one-time pardon was principally motivated by the need to address prison overcrowding.

The legislation caused an immediate and large reduction in the Italian prison population. Within one month of implementation, the Italian prison population declined by roughly 22,000 inmates, equivalent to a 36 percent decrease, with a corresponding decrease in the national incarceration rate from 103 to 66 inmates per 100,000. Buonanno and Raphael (2013) evaluated the effects of the massive prisoner release on crime using empirical methods quite similar to those employed here for California. The magnitude of the increase in crime coinciding with the mass prisoner release suggests that on average each released inmate generates 14 felony crime reports to the police per year. While most of the increase in Italian crime associated with the collective clemency is attributable to theft, there was also a notable and statistically significant increase in robbery, a crime classified in most nations as a violent felony.

Why was the effect on crime so much larger in Italy than in California? For one, these are two very different places with different demographics and systems of policing and criminal sentencing. Hence, the disparity may be due in part to differences in institutional and cultural factors. However, there are other key differences between the two case studies that are probably essential to understanding the difference in outcomes. Firstly, the pre-pardon incarceration rate in Italy stood at roughly 103 per 100,000 residents, quite close to the US incarceration rates that existed prior to 1980. In California, the pre-reform incarceration rate was between 425 and

430 per 100,000, more than four times that of Italy. If we add California's roughly 75,000 jail inmates (a more appropriate comparison to Italy since Italy has a unified prison and jail system) this rate increases to 625 per 100,000. Hence, one possible explanation is that California casts a much wider net in terms of who is sent to prison and for how long. Consequently, the average pre-reform inmate in California is perhaps less criminally prone than the average inmate in Italy, where prison is used more sparingly. Moreover, the Italian Collective Clemency impacted a broader base of prison inmates, while California's realignment reform was much more selectively focused on non-violent offenders and parole violators.

While there are no comparable single-state studies for the US, there are several empirical studies of the relationship between crime and incarceration that employ large data sets for all 50 states that track incarceration and crime over multiple years. These studies generate estimates of the number of crimes prevented per year of incarceration comparable to our estimate for California. This research generally finds significant effects of incarceration on crime through effects that appear to decline with the scale of incarceration. In other words, when the US incarceration rate was very low, small increases in incarceration tended to generate large reductions in crime. Conversely, when the US incarceration rate is high, small increases in incarceration generate very small reductions in crime. This is a textbook example of what economists refer to as diminishing returns to scale.

Levitt (1996) provides one of the most widely cited studies in this vein. Levitt (1996) analyzes data for US states covering the period 1971 through 1993, a period over which the average state in his sample had an incarceration rate of 166 per 100,000. The estimates in the study imply that each prison year served prevented approximately one violent offense and roughly seven property offenses. Raphael and Stoll (2013) provide a similar analysis, but for separate time-periods in the United States across which incarceration rates differ greatly. Specifically, Raphael and Stoll (2013) estimate the average number of crimes prevented for each prison year served for three time-periods: 1977 to 1988, 1989 to 1999, and 2000 to 2010. Average state incarceration rates during these three time-periods were 171, 349, and 449 respectively. The authors estimate that during the earliest period when incarceration rates were the lowest, each prison year served prevented around 1.2 violent felony offenses and 8.6 property offenses (roughly in line with Levitt's estimates). For the latter two periods with

higher incarceration rates, the average effect on violent crime falls to zero. The authors find effects on property crime of roughly 1.3 crimes per prison year served during the 1990s; and roughly two crimes per prison year served for the period from 2000 to 2010. Liedke, Piehl and Useem (2006) provide an additional analysis of state level crime and incarceration data, with an explicit focus on how the effect of incarceration on crime varies with the overall incarceration rate. The authors present strong evidence that the effectiveness of incarceration as a crime control device declines as the incarceration rate grows.

Our estimates for California line up quite closely with those from Raphael and Stoll (2013) for the US for more recent years, and are certainly in line with the results presented in Liedke, Piehl and Useem (2006). Moreover, when contrasted with the very large effects on crime related to the Italian mass prisoner release, the estimates presented in this report strongly reinforce the finding from prior research that the effectiveness of prison as a crime control device is subject to diminishing returns to scale.

Cost effectiveness and alternative crime-reducing strategies

There is a growing body of research that places a dollar value on the social costs of specific criminal offenses. Naturally, serious violent crimes carry larger social costs than less serious property offenses. With such costs estimates, one can estimate the benefits associated with incarcerating someone for a year and compare those benefits to the costs of incarceration. Levitt (1996) conducts such a cost-benefit analysis in his analysis of US states during the 1970s and 1980s, as do Buonanno and Raphael (2013) in their analysis of the 2006 Italian Collective Clemency bill. Levitt finds that the dollar value of the benefits in terms of crime reduction of higher incarceration during these early years outweigh the additional incarceration costs. Buonanno and Raphael (2013) find that the costs associated with higher crime caused by the 2006 prisoner release far outweighed the benefits in terms of prison spending.

With our estimates of the effect of realignment on crime, estimates of the costs of crime summarized in a 2010 RAND study by Heaton (2010), and estimates from the Legislative Analyst's Office (LAO) on the costs of incarceration in California, we can perform a similar analysis here. Our preferred empirical results suggest that each prison year served prevents 1.2 auto

thefts. Heaton's (2010) summary of the costs of crime literature implies that each auto theft costs on average USD 9,430. This suggests that each prison year served for those who, as a result of realignment, are no longer incarcerated prevents USD 11,316 in crime related costs. The LAO estimates that the annual cost of incarcerating a prison inmate in California is USD 51,889. Hence, unlike the analysis in Levitt (1996) and the analysis for the Italian prisoner release, here the benefits in terms of prison expenditure savings outweigh the costs in terms of slightly higher property crimes.

The simple cost-benefit analysis discussed above is useful for thinking about whether the social expenditure is justified on the margin. However, such analysis considers the effectiveness of a particular policy intervention in isolation, without considering what could be achieved by reallocating the saved resources towards other uses. For example, it may be the case that a reduction in incarceration, in the absence of some other policy intervention, may generate small increases in property crime. However, if the money saved from reduced prison expenditures was channeled into alternative, and perhaps more cost-effective crime control strategies, increases in crime need not be the end-result. Moreover, to the extent that alternative crime-control tools are at least as effective as incarceration, maintaining low crime rates would not require additional public expenditure.

Perhaps the most obvious policy tool with the strongest research base regarding its impact on crime concerns the expansion of local police forces. There is considerable empirical evidence of the general effectiveness of higher police staffing levels on crime. The research includes broad city-level analyses (Levitt 1996, 2002, Chalfin and McCrary forthcoming), studies that exploit temporary increases in policing (DiTella and Schargrodsky 2004), studies analyzing surges in hiring associated with federal policy (Evans and Owens 2007), as well as high frequency time series analysis (Corman and Mocan 2000). These studies consistently find relatively large effects of expanding city police forces on local crime rates. Heaton (2010) estimates that the benefits in terms of reduced crime of hiring an additional police officer exceed USD 300,000 per years in several cities; a figure substantially exceeding the annual cost of an additional officer. While part of the benefits from expanding police forces most certainly derive from apprehending and incapacitating highly criminally active individuals, a more consistent police presence is also likely to deter criminal activity, especially among those who may be transitionally passing through a high-of-

fending age range, when a future life in crime is certainly not a pre-ordained outcome.

Perhaps the most rigorous analysis of the effects of additional police on crime is provided in a recent study by Aaron Chalfin at the University of Cincinnati and Justin McCrary at the UC Berkeley Law School (2013). In an analysis of the period 1960 through 2010 of medium to large US cities, the authors find substantial and sizable effects of hiring additional police officers on crime rates, with notably statistically significant effects on very serious violent crimes. The empirical results in their analysis imply that each additional police officer reduces annual crime by 1.3 violent crimes and 4.2 property crimes. In an analysis of the costs and benefits of police expansion, the authors conclude that each dollar invested in additional policing generates USD 1.6 in crime savings. Based on these findings the authors conclude that the level of police staffing levels in the United States is too low. It is important to note that our cost-benefits analysis for prison suggests a dollar of additional incarceration generates only 23 cents in crime savings. In other words, the average benefit-cost ratio for incarcerating those who are now on the street as a result of realignment falls far short of one.

Conclusions

Taken together, the findings presented here paint a rather clear and consistent picture. Incarceration does prevent crime, but at high incarceration rates, such as those observed in the US today, the effects are limited and modest. The comparison of just one alternative strategy to incarceration, namely that of more police officers, suggests that there are probably other cost-effective policy interventions that can be deployed to combat crime in, from a world perspective, high incarceration places like California.

Of course, we have discussed only one possible alternative intervention (higher police staffing), but many alternative policy tools could and should be explored by researchers and policymakers. Such alternatives that may pay immediate returns include alternative systems of managing probationers and parolees, including swift-and-certain yet moderate alternative sanctions systems such as Hawaii's Opportunity Probation with Enforcement (HOPE), intervention, or high quality cognitive-behavioral therapy interventions for adult offenders. Interventions that may take a few years bear fruit, yet ultimately result in less crime and fewer offenders,

include early childhood human capital interventions and targeted interventions for high-risk youth. In sum, there are probably other policy interventions, including more police officers, that can be deployed to combat crime in many states in the US and that would not require high incarceration rates to maintain low crime rates.

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