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The Role of Policy in Prison Growth and Decline

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ABSTRACT

Between 1975 and 2008, the US incarceration rate increased by roughly 400 percent. Trends in crime rates, arrest rates per crime committed, conviction rates per arrest, and expected time-served in prison given conviction all influence trends in incarceration rates. Available data do not allow researchers to precisely measure the contribution of each of these factors to the US prison boom. However, increases in expected prison time-served among those arrested for many different offenses were the most important drivers of rising incarceration rates. We argue that changes in policies that govern sentencing and parole are the likely drivers of these increases. We also discuss potential reforms that may reduce expected time-served among convicted offenders while minimizing harm to public safety.

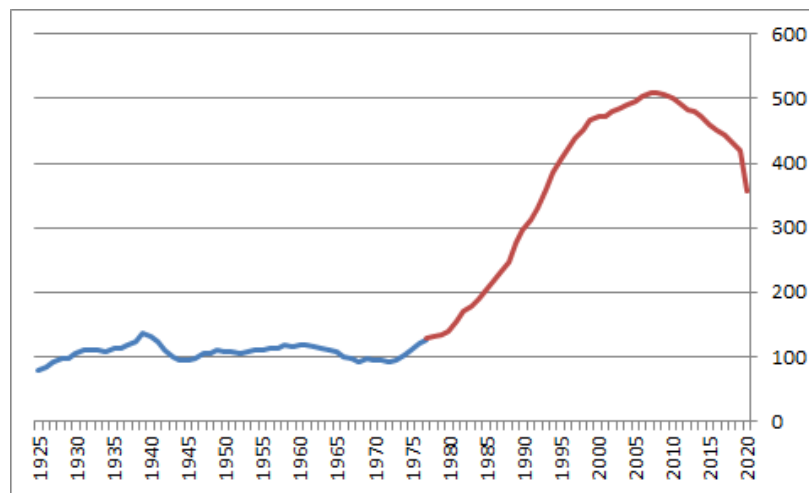
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Introduction

The federal government began publishing annual estimates of the nation's prison population in 1925, and over the half-century between 1925 and 1975, the incarceration rate in the United States was relatively constant. Figure 1 shows that, during almost the entire period, the rate was either just below or just above 100 prisoners per 100,000 persons. From 1975 to 1980, the incarceration rate rose at a modest rate, and then for almost two decades, the population of prisoners grew much faster than the rate of population growth. The incarceration rate continued growing at a slower rate from the late 1990s to roughly 2008 before declining at a modest rate until 2019. When the COVID pandemic began in 2020, public health officials urged corrections officials to reduce prison populations in order to mitigate the spread of COVID in prisons. In response, many states implemented early release programs. In addition, stay-at-home orders likely impacted the volume and type of law-violating behavior that came to the attention of law enforcement, and court hearings and proceedings got delayed. As a result, the national incarceration rate fell by roughly 15 percent in one year.

FIGURE 1

Sentenced Prisoners in State and Federal Prisons per 100,000 U.S. Residents, 1925-2020



Notes: Year-end prisoner count estimates are from the National Prisoner Statistics (NPS) program as reported in the BJS annual publication series “Prisoners” since 1980 and the BJS publication “State and Federal Prisoners, 1925-85.” Estimates are often revised in later publications as State departments of corrections and the Federal Bureau of Prisons submit updated or corrected reports. Therefore, we use the most recent estimate as of the 2020 publication wherever it is available. All publications are available on the BJS website (https://bjs.ojp.gov/library/publications/list?series_filter=Prisoners). Note that definitions of sentenced prison populations have slightly changed over time. Data for 1925-1939 include sentenced prisoners in State and Federal prisons and reformatories whether committed for felonies or misdemeanors. Data for 1940-70 include all adult felons serving sentences in State and Federal institutions. Data since 1971 include all juvenile and adult offenders sentenced to State or Federal correctional institutions whose maximum sentence is more than one year. Before 1977, only prisoners in the custody of State and Federal correctional systems were counted, whereas after 1977, all prisoners under the jurisdiction of State and Federal correctional systems were counted. U.S. population data for generating incarceration rates are from Census Bureau historical population estimates as available on <https://usafacts.org/data/topics/people-society/population-and-demographics/population-data/population/>.

This chapter reviews the research that explores why imprisonment rates in the United States increased by more than a factor of five in just over thirty years, i.e. 1975-2008. Further, we discuss more recent work on why prison populations have remained high by historical standards since 2008. For decades, many developed countries in Europe have typically reported incarceration rates of 130 or less.¹ However, the US rate remained above 400 from the mid 1990s until 2019, and it may well return to this level now that the pandemic appears to be over.

We focus much of our attention on the 1980s and 1990s. Most of the striking growth in incarceration rates took place in these two decades, and several of the key studies that we review rely on micro data on prison admissions and releases that were not available in the 1970s or earlier. We also focus on a set of specific policy questions: How much did changes in sentencing policies contribute to the dramatic growth of US prison populations from roughly 1980 to the start of the Great Recession in 2008? Further, how have policy changes contributed to the modest decline in prison populations after 2008, and what additional reforms could reduce prison populations further without significantly harming public safety?

Here, we define sentencing policies as rules and guidelines that govern the sentences that courts assign to convicted offenders as well as the parole policies that govern how specific sentences map into expected time-served in prison. Most empirical work on the consequences of changes in sentencing policies over time focuses on the relationships between arrests for different alleged offenses and actual or expected time spent in prison. Researchers who adopt this approach often assume that the likelihood of conviction given arrest is roughly constant over time. This approach primarily reflects the paucity of data sources that allow researchers to link arrests, convictions, and sentences within specific jurisdictions. Nonetheless, it is possible that the introduction of more punitive sentencing policies may increase conviction rates given arrest. Sentencing enhancements and provisions that require judges to assign prison rather than probation as punishment limit the power of judges to show leniency, and this may strengthen the hand of any prosecutor who is trying to convince a defendant to plead guilty and accept the terms of a plea bargain rather than go to trial.²

We conclude that prison populations grew rapidly in the US primarily because both state and federal governments adopted more punitive sentencing policies, but no one specific change in sentencing policy drove prison growth. Among different states, sentencing policies became more punitive in hundreds of different ways that impacted the punishment of persons convicted of a broad range of crimes.

After 2008, several reforms appear to have generated reductions in prison populations. Some of the most noteworthy and fruitful reform efforts were implemented in the state of California and in the federal justice system. Nonetheless, many of the policies that drove the prison boom in the 1980s and 1990s remain in effect.

In the next section, we provide a brief review of the history of sentencing reforms during the later twentieth century. We then review empirical work that employed event-study models to assess the impact of specific types of sentencing policy changes. After discussing the limitations of this approach, we explore methods that attempt to decompose the growth in prison populations into various factors that evolve over time.

¹Incarceration rates also first rose and then fell from 1990 to 2020 in many European countries, but these changes have been nowhere near as large as in the US. See <https://dataunodc.un.org/dp-intentional-homicide-victims> and <https://www.prisonstudies.org/world-prison-brief-data>.

²It is possible that, as political conditions change, both prosecutors and judges may choose to be more or less severe when dealing with defendants, even if laws and guidelines do not change. These shifts do not represent policy changes, but they may confound the attempts to isolate the impacts of shifts in policy.

These methods provide clear evidence that changes in sentencing policies were a key driver of the prison boom. After reviewing this evidence, we discuss recent attempts to shrink prison populations through reforms that make criminal justice policies less punitive. We conclude by assessing the potential for further reforms that could reduce prison populations without creating severe harm to public safety.

1 One New Policy After Another

In the 1970s, states began to move away from indeterminate sentencing regimes that gave judges and parole boards considerable discretion over the punishments assigned to individuals convicted of crimes. Prior to this time, judges typically enjoyed considerable discretion in assigning sentences, and this allowed judges to consider mitigating circumstances as well as prospects for rehabilitation when sentencing convicted offenders. However, actors from across the political spectrum supported the shift toward more determinate sentencing. Progressive activists argued that judicial discretion invited racial discrimination, while many of their political opponents argued that indeterminacy permitted forms of leniency that compromised public safety.³

States pursued more determinate and often more punitive sentencing using a variety of tools. During the final two decades of the twentieth century, roughly half of the states established independent sentencing commissions, and often these commissions created sentencing rules and guidelines that made sentences both more determinate and more punitive. Further, many states without formal sentencing commissions passed numerous laws that spell out presumptive sentences.⁴ Some laws spell out presumptive sentences for specific crimes. Others specify sentencing enhancements that assign more severe penalties to offenders with numerous prior convictions, especially those with prior convictions for violent crimes. The most famous law of this kind is the 1994 California statute AB 971, commonly known as “Three Strikes and You’re Out,” but many states passed similar laws.

Numerous states also restricted the capacity of parole authorities to grant early release for good behavior. California, Colorado, Illinois, Indiana, Maine, and New Mexico were among the first states to restrict discretionary releases by parole boards, but a number of other states followed suit in the 1980s and 1990s.

The most prominent effort to reduce the early release of persons sentenced to prison was The Violent Crime Control and Law Enforcement Act (1994). This federal statute established the Truth-in-Sentencing (TIS) Incentive Grants Program, which provided grants for prison construction and expansion. To qualify, states had to adopt laws that forced persons sentenced to prison to serve large fractions of their nominal sentences. Five states adopted TIS laws before 1994, and twenty two states quickly passed TIS laws that secured their access to federal funding for prison system expansions. Most states now have laws that force some or all prisoners to serve certain minimum fractions of their nominal sentences.⁵

The complexity of criminal justice systems at the state level as well as the complex interactions between state laws and federal programs create almost insurmountable problems for scholars who conduct empirical investigations that seek to establish concrete links between prison growth and specific features of state-level

³See [Raphael and Stoll \(2013\)](#) as well as [Stemen and Rengifo \(2011\)](#) for discussions of this literature. See [Dansky \(2008\)](#) for references specific to the debate in California.

⁴See [Stemen et al. \(2006\)](#), [Raphael and Stoll \(2013\)](#), and [Neal and Rick \(2014\)](#) for more details.

⁵See [Ditton and Wilson \(1999\)](#) for a Bureau of Justice Statistics report on the implementation of Truth in Sentencing laws during the 1990s. See [Neal and Rick \(2014\)](#) as well.

criminal justice systems that promote determinacy or severity. The presence of a specific “type” of law in a given state tells researchers little about the extent of legislative efforts to make corrections policies more punitive in that state. Groups of states often adopt new corrections laws that are nominally similar but still differ in important ways. Further, given the complexity of many sentencing laws, it is not obvious how one could construct a comprehensive index of punitiveness at the state level for even a single point in time, much less a set of indices that track the evolution of punitiveness within each state over time, and we have found no studies that even attempted these quixotic measurement tasks.⁶

Nonetheless, we argue below that researchers can build a strong case that changes in the policies that shape the sentencing of convicted offenders, the release of offenders from prison, and the return of parolees to prison must be key reasons that prison populations are so large now relative to those observed in the 1970s. This argument involves three steps. First, the mixed results among papers that examine the impacts of changes in sentencing laws using an event study approach do not constitute strong evidence that the numerous sentencing reforms implemented in the 1980s and 1990s had small impacts on the growth of prison populations. Over this period, most states introduced new sentencing rules that mandated prison time for some offenders. Some states adopted reforms that share common names or provisions but work quite differently in practice. Other states adopted reforms that involve different names or implementation details but have similar impacts on the severity of sentences assigned to convicted offenders. These realities pose challenges for event study methods that require clean definitions of treatment and control groups. Second, decomposition methods that try to isolate various sources of prison growth are more promising tools for identifying the contribution of sentencing reforms to prison growth. Third, although different decomposition methods have not produced identical results, these methods have produced clear evidence that the expected prison time facing arrested offenders in all crime categories rose during the 1980s and 1990s. These increases drove the prison boom. There is room to debate whether changes in sentencing policies account for 90 percent of the dramatic growth in US prison populations during the 1980s and 1990s or only 70 percent. However, there is no doubt that changes in sentencing policies are the key driver of the prison growth over this period.

Figure 2 presents arrest rates from 1980 to 2020 for three major crime categories: violent crimes, property crimes, and drug offenses. Let us compare the periods 1980-85 to 2000-05. Drug arrests are higher in the latter period, but arrest rates for violent crime are about the same, while arrests rates for property crimes are much lower in the 2000-05 period. In addition, arrests for all other crimes are about the same over these two periods. Nonetheless, Figure 3 shows that 2005 incarceration rates at both the state and federal level were more than double the corresponding rates for 1985. The vast majority of persons in prison are persons who were arrested in the previous five years,⁷ and in 1985, those arrested for drug offenses entered prison at low rates. Thus, as we spell out below, the differences in arrest rates between these two periods simply cannot account for the difference in 2005 and 1985 incarceration rates.

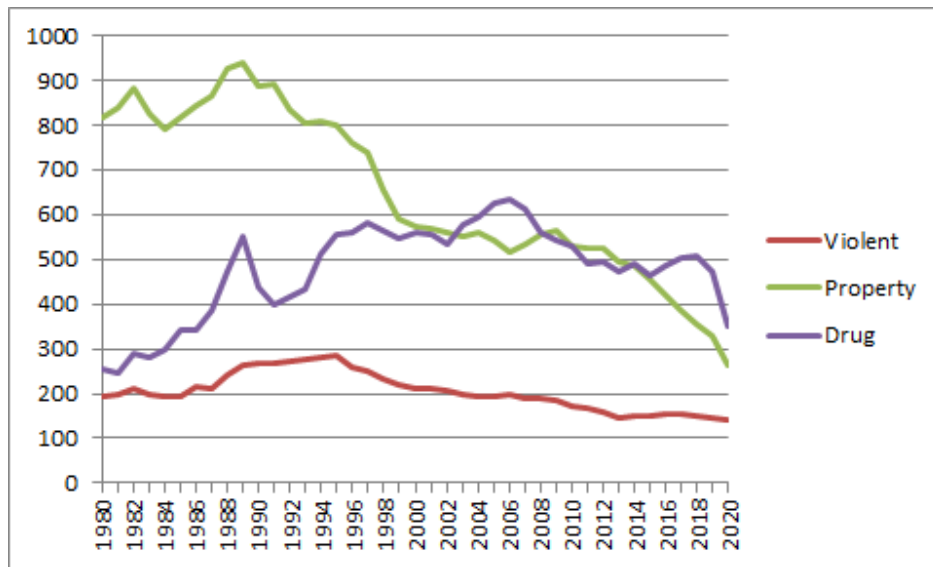
[Raphael and Stoll \(2013\)](#) present related and even more striking evidence. They present a graph of state incarceration rates in 2007 versus state incarceration rates in 1977. In every state but one, the rate more than doubled. Further, the overall incarceration rate in 2007 was more than three times the rate for 1977.

⁶Note that in order to create such an index, researchers would have to understand how a specific set of policies translated into a set of distributions of time-served that condition on conviction for specific offenses. Then, researchers would need to conduct simulations that generated sample distributions of simulated time-served for various populations of convicted offenders, and then collapse the information contained in these simulated distributions into a single index of punitiveness.

⁷For example, using publicly available data from the Illinois Department of Corrections from December of 2007, we calculate that roughly 75 percent of inmates in Illinois prisons had been admitted in the previous 4 years.

There is nothing in the arrest rate data for 1972-1976 versus 2002-2006 that could ever account for such a dramatic and widespread increase in prison populations.⁸ It is hard to imagine that one could fashion an explanation for the changes in state-level incarceration rates reported by Raphael and Stoll (2013) that does not involve a change over time in the distributions of punishments assigned to persons arrested for specific offenses. Changes in sentencing policy almost surely contributed to the stunning rise in incarceration rates during the final decades of the 20th century. Below, we review various efforts to pin down exactly how and by how much.

FIGURE 2
Annual Arrests per 100,000 U.S. Residents, 1980-2020

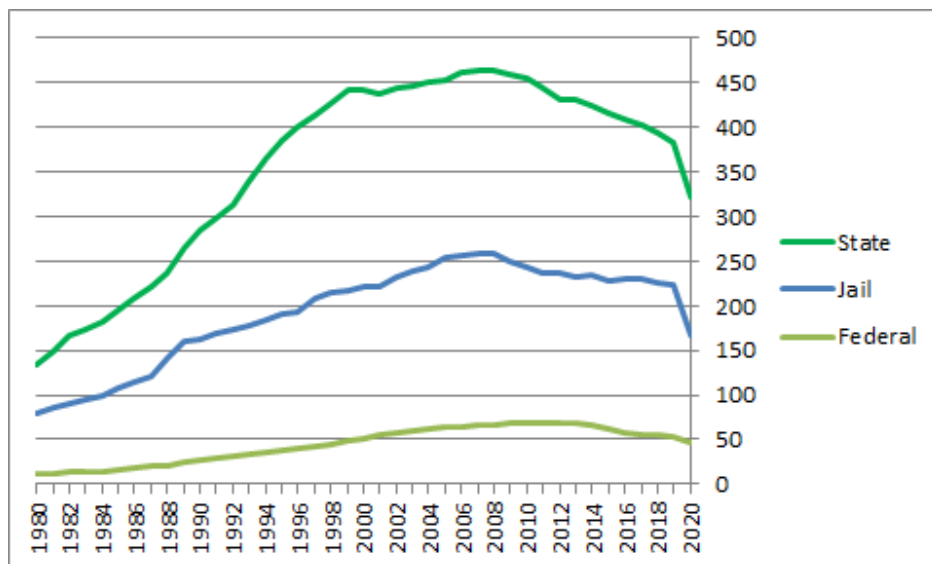


Notes: Arrest estimates for 1980-2014 were developed by the Bureau of Justice Statistics and disseminated through the “Arrest Data Analysis Tool,” available from the BJS website. Arrest estimates for 2015-2020 were developed by the National Center for Juvenile Justice based on the FBI’s annual Master Arrest Files of 12-month reporting departments available from the Crime Data Explorer (<https://crime-data-explorer.fr.cloud.gov/pages/downloads>). Arrest estimates for 2015-2019 were revised in June 2022. Note that beginning in 2013, the FBI broadened the definition of rape, removing the phrase ‘forcible’ from the offense name and description. Law enforcement agencies may submit data on rape arrests based on either the new or legacy definition of rape. Due to differences in agency reporting practices, national estimates for the offenses of ‘rape’ and ‘sex offenses’ are not available after 2012. Therefore, the “violent crimes” category reported here only includes the offenses of murder, robbery, and aggravated assault for all years 1980-2020, but not ‘rape’ and ‘sex offenses.’ In any given year prior to the change in the rape definition, these offenses accounted for more than 95 percent of arrests for Violent Crime Index offenses. All data are available for download at https://www.ojjdp.gov/ojstatbb/crime/ucr_trend.asp?table.in=2.

⁸The population of the US grew by roughly 40 percent between the early 1970s and the early 2000s. On a per-capita basis, arrests for violent crime were not that different in 1972-76 versus 2002-06, and arrests for property crime were lower. Drug arrest rates are much higher in the latter period, but a tiny fraction of drug arrests resulted in prison time before 1980. See Table 6 in Neal and Rick (2014) for more details.

FIGURE 3

Prisoners in Jail and under the Jurisdiction of State and Federal Institutions, per 100,000 U.S. Residents, 1980-2020



Notes: Data for State and Federal prison populations are from the National Prisoner Statistics (NPS) program as reported in the annual BJS publication series “Prisoners” and refer to year-end populations of all prisoners under jurisdiction, including those sentenced to less than one year. All publications are available on the BJS website (https://bjs.ojp.gov/library/publications/list?series_filter=Prisoners). Data for jail populations are mid-year estimates from the Census of Jails and the Annual Survey of Jails as reported in the annual BJS publication series “Correctional Populations in the United States.” (https://bjs.ojp.gov/library/publications/list?series_filter=Correctional+Populations+in+the+United+States). Estimates are often revised in later publications as reporting agencies submit updated or corrected reports. Therefore, we use the most recent estimate as of the 2020 publication wherever it is available. US population data for generating incarceration rates are from Census Bureau historical population estimates as available at <https://usafacts.org/data/topics/people-society/population-and-demographics/population-data/population/>.

Competing Hypotheses

Along the way, we address two competing ideas. To begin, Pfaff (2017a) argues that shifts in prosecutor behavior are the most important driver of growth in prison populations during the prison boom. We re-examine the evidence Pfaff cites and find little support for his argument. In addition, both King (2019) and Shen et al. (2020) note that the crime wave of the 1980s and 1990s created a large stock of potential offenders with significant criminal records. Since most state sentencing regimes have long assigned more severe punishment to recidivists, this shift in the composition of defendants likely contributed to the prison boom or at least helps explain why prison populations declined at such a slow pace after 2008. However, no national data or even data from multiple states permits a detailed analysis of how much this factor contributed to prison growth independently of the wave of sentencing reforms that assigned increasingly harsh punishments to repeat offenders. In addition, the one multi-state data set we found that tracks the criminal history of defendants shows that, before 2000, there were only modest shifts in the fraction of felony defendants with a prior felony conviction.

2 Empirical Literature on the Effects of Specific Laws

The literature contains a number of papers that attempt to isolate the effects of specific types of legal reforms on the growth of prison populations by applying panel regression methods to data sets that track variation in outcomes and policies among states and over time. For example, [Zhang et al. \(2009\)](#) regress admission rates, incarceration rates, and expected time served on six different measures of policies that influence the severity of punishment. They exploit policy variation among states and over time from 1973 to 1998. Their empirical proxies for policy are indicators for the presence of the following: (1) voluntary sentencing guidelines, (2) presumptive sentencing guidelines, (3) habitual offender laws, (4) abolition of discretionary release by parole boards, (5) requirements that sentencing guidelines consider prison capacity, and (6) truth-in-sentencing laws.

[Zhang et al. \(2009\)](#) report few statistically significant estimates of policy impacts on the three outcomes they consider, and some of their results imply that greater sentencing severity reduces prison populations. They argue that their results do not support the hypothesis that policies designed to make sentencing more determinate and more severe contributed much to prison growth over the 1970s and 1980s. In addition, [Stemen et al. \(2006\)](#) and [Stemen and Rengifo \(2011\)](#) develop similar empirical models of annual incarceration rates at the state level, and they too do not find strong statistical relationships between specific policies that are designed to enhance the severity of punishment and the growth of incarceration rates.

Two measurement issues plague these studies. First, some states have introduced policies that appear the same in terms of the statutory language used to describe their purpose and effect, but in practice, these laws have often been implemented quite differently and were never intended to accomplish the same objectives. For example, some states have abolished discretionary parole release in an effort to constrain current or future parole boards that may adopt lenient release standards, while other states have abolished discretionary release as part of efforts to make it easier for corrections authorities to forecast and manage future prison populations.⁹ Further, different states have adopted policies that have similar impacts on the punishments that offenders receive, but the statutory language that describes these policies can be quite different. For example, consider two states that both impose a mandatory sentence of four years in prison for a certain crime, and both give day-for-day credit for good-time-served, so these four-year sentences typically result in two years of time-served. One state raises the mandatory minimum to six years while the other state leaves the mandatory minimum at four years and introduces a rule that prisoners must now serve three days to get one day of time-served credit. These reforms are completely different with respect to statutory provisions, but both raise expected time-served from two to three years for defendants who receive the mandatory minimum.

Researchers who employ event study models to measure the impacts of criminal justice reforms must always worry that the jurisdictions in their treatment groups are not all implementing the same treatment and that their implied control groups are not valid control groups. Between 1975 and the early 2000s, all states adopted new mandatory minimum statutes, and it seems reasonable to conjecture that many also tightened

⁹[Zhang et al. \(2009\)](#) discuss how the details of laws that enhance sentences for habitual offenders differ greatly among states that adopted them. [Neal and Rick \(2014\)](#) review results from several studies that shows how the impacts of both sentencing guidelines and restrictions of parole board discretion appear to be quite different in states where these policies are seen as tools for better matching prison populations with prison system resources. See the discussion of [Stemen and Rengifo \(2011\)](#), [Zhang et al. \(2009\)](#), [Stemen et al. \(2006\)](#), [Frase \(2005\)](#), [Nicholson-Crotty \(2004\)](#), and [Marvell \(1995\)](#).

standards for parole revocation, applied more public scrutiny to parole board decisions, etc. in ways that may not be reflected in coding schemes that seek to capture the adoption of a specific type of statute.

Researchers are aware of these methodological concerns. [Stemen et al. \(2006\)](#) performed additional analyses in which they tried to code up variables that captured some of the variation over time and among states in mandatory sentencing practices. Given the enormous variation in mandatory sentencing rules among states at a point in time and within specific states over time, it is hard to imagine how researchers could create an accurate index that captured both geographic and temporal variation in mandatory minimum punitiveness, and the authors did not attempt to create such an index. Rather, they created counts of the different types of mandatory minimum statutes in several different categories: (i) weapons use (ii) serious harm to victims (iii) crimes committed under supervision or in custody and (iv) hate crimes.

With the exception of (ii), increases in the numbers of each of these statutes on the books are significantly correlated with growth in prison populations, and on average, when states add ten new mandatory minimum statutes, the expected incarceration rate increases by 23 (out of 100,000). However, the authors write, “we do not believe that the mandatory sentencing laws considered here are necessarily directly contributing to increases in incarceration rates; rather, they are used here as proxies for states’ general approaches to mandatory sentencing laws and, in this sense, indicate the states’ general use of mandatory sentencing policies.”

The terms “proxies” and “general use” in the quote above are important. The authors are conjecturing that in times and places where legislatures are devoting considerable energy to passing these particular types of statutes, state officials are also making other legislative and administrative rule changes to limit the capacity of judges and parole boards to show leniency.

This is a reasonable conjecture, but it also highlights the limits of panel regression methods as tools for discovering whether or not specific policy changes drove prison growth. When scholars code different policies as the same policy or omit controls for relevant but unmeasured policies that are changing contemporaneously with measured policies, they should not expect panel regressions to produce useful or even interpretable results.

Finally, as a rule, the panel regression studies that have attempted to measure the impacts of specific sentencing and parole reforms have not devoted enough attention to variation in the size and expected timing of the impacts of a new policy on different measures of incarceration outcomes. Imagine a homogenous change in sentencing policy adopted in a number of different states at varying times, and assume that this new policy took a simple form. Assume this new policy added three years to every sentence of at least two years that would have been given under previous law. This change would have no effect on admissions rates in any period because it would only apply to those who were going to serve at least two years anyway. The policy would have important effects on steady-state incarceration rates and expected time-served among admitted prisoners, but data on prison populations would provide no evidence of these impacts until at least two years after implementation. In this example, researchers who adopt event study methods to assess the impacts of such a policy change will produce misleading results if they do not map the details of the statute carefully into the design of the empirical study.

Also, note that, even given careful attention to timing, a key measurement error problem plagues regression models like those presented in [Zhang et al. \(2009\)](#). The authors use ratios of prison populations to admissions flows to estimate expected time-served. However, this approach only works when prison

populations are in steady-state, and the goal of the study is to measure the impact of policy changes on prison growth. Thus, given our hypothetical policy that adds three years to every sentence that would have been at least two years, such steady-state measures of expected time-served would be biased down for years following implementation, and this bias would create a correlation between any indicator variable for the existence of such a law in a given state in a given year and the measurement error in expected time-served for that state-year combination.

3 Decomposition Methods

Given the difficulty of using event study tools to assess the impacts of changes in sentencing policies, other researchers have employed statistical decomposition methods to gain insight into the sources of prison growth over time. Decomposition methods start with the observation that in steady state, incarceration rates are constant and thus, the fraction of persons who enter prison each period equals the fraction of persons who exit prison. The former is given by

$$(c - i) * \alpha * \gamma * \sum_{s=1}^S \rho_s$$

where

- c = the fraction of criminals in the population
- i = the fraction incarcerated in the population
- α = the probability of arrest given engagement in crime
- γ = the probability of conviction given arrest
- ρ_s = the probability of entering prison to serve a term of length s given conviction
- S = the maximum possible time-served in prison

The latter is

$$i \left(\frac{\rho_1}{\sum_{s=1}^S s\rho_s} + \frac{\rho_2}{\sum_{s=1}^S s\rho_s} \dots + \frac{\rho_S}{\sum_{s=1}^S s\rho_s} \right),$$

where the term in brackets is the fraction of inmates that exits prison each year.¹⁰ If we equate the flows in

¹⁰To see this, note that in steady-state, the fraction of inmates serving a term of n years is $\frac{n\rho_n}{\sum_{s=1}^S s\rho_s}$, and of those serving n years, a fraction $1/n$ exits each year (i.e., each period, all of the persons who entered last period to serve one-year terms exit; half of those serving a two-year terms exit; one third of those serving three-year terms exit, .. etc). Hence, the fraction of all inmates that exits after having served n years is simply $\frac{\rho_n}{\sum_{s=1}^S s\rho_s}$. Adding up over all $n = 1, 2, \dots, S$ to calculate the total fraction of inmates that exits prison each year yields the term in brackets.

and out of incarceration, we get the following steady state equation for i :¹¹

$$i = (c - i) * \alpha * \gamma * \sum_{s=1}^S s \rho_s \quad (1)$$

Neal and Rick (2016) do not impose steady-state conditions, but they do build their simulation models using the laws of motion that yield this description of steady-state relationships. Below, we discuss the Neal and Rick (2016) results and how we interpret them, but first we discuss a competing approach.

3.1 A Puzzling Interpretation of Decomposition Results

Several researchers employ this version of equation 1:

$$i = (c - i) * \alpha * \gamma * \sum_{s=1}^S \rho_s * \frac{\sum_{s=1}^S s \rho_s}{\sum_{s=1}^S \rho_s} \quad (2)$$

The two equations are simply alternative characterizations of the same steady-state condition, but we contend that a framework commonly used for interpreting the results from empirical models of the latter version often yields misleading claims.

In equation 2, the last term is the average sentence length among those who receive a prison sentence, and some researchers treat movements in this quantity as proxies for the impacts of policy changes that affect sentencing, e.g. mandatory minimum sentences, restrictions on early release, etc. For example, in a series of publications, John Pfaff argues that since admissions per arrest rose dramatically after 1980 while both average time-served (i.e. the last term) and the distribution of time-served given prison admission remained relatively constant, researchers should devote less attention to sentencing policies and more attention to *admissions practices* and *admissions policies*.¹²

Pfaff's argument puzzles us. Taken together, the combination of rising prison admission rates per arrest and a relatively fixed distribution of time-served among those admitted to prison should not shift our attention away from sentencing policy but focus our attention squarely on it.¹³ If the rate of prison admissions given arrest increases sharply while the distribution of time-served *given* admission remains fixed, it follows immediately that the probabilities of serving short, medium, and long prison terms given arrest also increase sharply, which guarantees that the expected time-served in prison given arrest also increases.

Shortly, we return to the possibility that ratios of convictions to arrests also changed during the prison boom, but for a moment, assume that the probability of conviction given arrest is fixed over time. In this scenario, the only way to increase the likelihoods, given arrest, of serving prison terms of all lengths is to

¹¹This equation is a starting point for building simulation models. The framework can and is often extended to include crime-specific sentencing weights. Also, researchers can and do extend this framework to include transitions in and out of parole.

¹²Pfaff (2011), Pfaff (2012), Pfaff (2017a). Neal and Rick (2014) provide a discussion of how the convention of using changes in time-served given prison entry as proxies for changes in sentencing severity impacts the discussion of results in other related studies.

¹³Neal and Rick (2016) provide specific examples of shifts to more punitive sentencing policies that raise admission rates while leaving the distribution of time-served given admission unchanged.

assign more punitive sentences to convicted offenders.¹⁴ Thus, more severe sentencing policies are obvious candidate explanations for observed trends in prison admissions per arrest and average time-served given prison admission during the prison boom.

Yet, Pfaff (2012) and Pfaff (2017a) correctly note that rates of convictions per arrest may not have been constant during the prison boom. Pfaff (2012) examines data on court filings from the National Center for State Courts (NCSC) over the period 1994-2008 and claims that these data document a sharp rise in the overall ratio of felony cases filed per arrest, which could clearly generate an increase in felony convictions per arrest. Based on these results, Pfaff (2012) and Pfaff (2017a) argue that prison populations grew primarily because prosecutors became more aggressive over time. Taken together, Pfaff's writings suggest that the stability of the distribution of time-served given admission to prison over time is evidence that judges never changed the way they sentenced convicted offenders, but prosecutors grew more aggressive over time and provided judges with many more opportunities to sentence convicted offenders.

Taken as a whole, available data on arrests, convictions, prison admissions, and time-served in prison do not support Pfaff's conjecture concerning why average-time served given admission changed little as admissions per arrest grew rapidly. In a review of Pfaff (2017a), Bellin (2017) argues that Pfaff exaggerates the capacity of prosecutors to turn marginal cases into convictions that result in prison sentences. Further, Bellin (2017) contends that improvements in data gathering procedures and not increases in actual filings per arrest drive the increase in NCSC filings over the 1994-2008 period. Bellin bases this conclusion on information gleaned from interviews of NCSC staff, and Bellin also notes that data from the Federal government, the state of California, and the State Court Processing Statistics (SCPS) published by the Bureau of Justice Statistics do not show a significant increase in felony filings per arrest after 1994.¹⁵

In his response to Bellin, Pfaff (2017b) reports that his communications with the NCSC staff give him confidence in the NCSC data, and he describes the SCPS data as "quirky." However, the debate between Pfaff and Bellin over the quality of the NCSC data is a debate about a data set that starts after the US incarceration rate per 100,000 people was already near 400. Further, these data do not break down filings by arrest or charge category, and therefore cannot speak to how the dramatic change in the composition of arrests during the period 1994-2008 may have contributed to prison growth.¹⁶

Pfaff (2017b) also calculates total convictions per arrest directly using data from the National Judicial Reporting Program (NJRP). He reports that the ratio of convictions to arrests in the NJRP data rose from just over .17 in 1990 to almost .24 in 2006, an increase of more than 40 percent. However, in footnote 39, he writes "In both *Locked In* and here, I focus on arrests for violent, property, and non-marijuana drug arrests, since so few marijuana cases end up in prison."

Pfaff's decision to exclude marijuana cases biases his results. King and Mauer (2006) report that "marijuana arrests increased by 113 percent between 1990 and 2002, while overall arrests decreased by 3 percent," and they add that, "of the 450,000 increase in drug arrests during the period 1990-2002, 82% of the growth was for marijuana, and 79% was for marijuana possession alone." Their results also imply that,

¹⁴Here, we are setting aside an important measurement question that Pfaff's taxonomy raises. Since sentencing policies constrain the decisions that prosecutors make when they file charges or negotiate plea bargains and sentencing policies changed rapidly during the prison boom, how can researchers isolate changes in prosecutor behavior that are independent of changes in sentencing policies? We know of no existing data sets that would allow researchers to tackle this identification challenge.

¹⁵See Raphael and Stoll (2013) for the analyses that show no evidence that California prosecutors became more aggressive over time.

¹⁶For example, arrests for drug offenses grew rapidly while arrest for property crime dropped sharply.

in 2000, 6 percent of marijuana arrests resulted in felony convictions, and 2 percent resulted in prison admissions. As points of comparison, [Neal and Rick \(2016\)](#) estimate that, in 2000, less than 4 percent of aggravated assault arrests resulted in prison time and just over 2 percent of theft arrests resulted in prison time.

We do not see how Pfaff can defend his choice to include arrests for aggravated assault and theft while excluding marijuana arrests. So, we use the NJRP data to calculate felony convictions per arrest for all crimes and within the violent, property, and drug categories over the period 1990-2006. Table 1 presents the results. We present two versions of the series for total convictions per arrest. The final column follows Pfaff and excludes arrests for crimes in the “Other” category. The penultimate column presents the ratio of all felony convictions to all arrests.

Table 1
Convictions Per Arrest: NJRP convictions over UCR Arrests

Year	Violent	Property	Drug	Other	Total	Total excl. "Other"
1990	22.2%	12.7%	25.2%	1.3%	5.9%	17.7%
1992	23.5%	13.9%	26.3%	1.5%	6.4%	19.0%
1994	22.2%	12.9%	20.3%	1.6%	6.1%	16.9%
1996	24.1%	14.6%	23.1%	1.7%	6.7%	19.2%
1998	25.5%	15.7%	20.2%	1.6%	6.5%	19.0%
2000	29.0%	16.2%	20.2%	1.7%	6.7%	19.9%
2002	33.3%	20.1%	22.1%	1.9%	7.7%	23.0%
2004	34.7%	18.9%	20.8%	2.1%	7.8%	22.0%
2006	35.1%	20.9%	20.0%	2.2%	7.9%	22.5%

Notes: Conviction rates are calculated as state court convictions per number of national arrests within the applicable category. Conviction count estimates come from the National Judicial Reporting Program (NJRP) as reported in the biennial publication series “Felony Sentences in State Courts,” available from the BJS website at https://bjs.ojp.gov/library/publications/list?series_filter=Felony+Sentences+in+State+Courts. National arrest estimates were developed by the Bureau of Justice Statistics and disseminated through the “Arrest Data Analysis Tool,” available from the BJS website at <https://www.ojjdp.gov/ojstatbb/crime/ucr.trend.asp?table.in=2>.

Three patterns in these results are noteworthy. First, [Pfaff \(2017b\)](#) reports an overall increase in the ratio of convictions to arrests during the period 1990 to 2006 that is greater than the 27 percent increase we report. Including marijuana cases increases the ratio of convictions to arrests in 1990 and reduces it in 2006. Second, more than half of the 1990-2006 increase in convictions per arrest occurs between 2000 and 2002, and our review of the NJRP codebooks revealed that the NJRP adopted a new sampling scheme in 2002. We conjecture that this re-design is the most likely explanation for the sharp jump in the ratio of total convictions to arrests,¹⁷ and therefore focus our attention on the 1990-2000 results, where we find that convictions per arrest grew by just over 12 percent. Finally, just as trends in arrest rates varied among crime categories in the 1990s, trends in rates of convictions per arrest also varied. From 1990 to 2000, the ratio of convictions to arrests rose by almost 31 percent among those charged with violent crimes, but this same ratio fell roughly 20 percent among those charged with drug crimes.

¹⁷We have consulted with the BJS staff, and we received confirmation that this conjecture is a “reasonable assumption.” Note that there is no growth in total convictions per arrest during 2002-2006 when the new survey methodology remained fixed. See the relevant codebooks here: <https://www.icpsr.umich.edu/web/ICPSR/series/00077>

We have calculated the expected level of convictions in 2000 given 2000 arrest data and 1990 rates of convictions per arrest within each crime category, and we have also calculated the expected level of convictions in 1990 given the 1990 arrest data and the 2000 rates of convictions per arrest. Both exercises reveal that the 12 percent increase in total convictions per arrest overstates the increase attributable to changes in convictions rates within crime categories.¹⁸ However, for the purpose of illustration, we explore what conclusions one could draw based on a 12 percent increase in the rate of convictions per arrest during the 1990s.

Table 2 presents results from [Neal and Rick \(2016\)](#) concerning changes in ratios of prison admissions to arrests over the period 1985-2000. The final row shows that, overall, this ratio rose by 84 percent. So, let us take a 12 percent increase in convictions per arrest during the 1990s and multiply it by 1.5 to get a plausible proxy of 18 percent for the increase in convictions per arrest between 1985 and 2000. Next, note that in order to create an 84 percent increase in prison admissions per arrest, one still needs a 56 percent increase in the ratio of prison admissions to convictions.¹⁹

Further, [Neal and Rick \(2014\)](#) report that average time-served following prison admissions that resulted from court sentences changed little during the prison boom for non-violent crimes and actually increased among persons entering prison for violent offenses.²⁰ Putting all these pieces together, any modest increase in convictions per arrest during the prison boom was likely accompanied by a much more dramatic increase in prison admissions per conviction and a small increase in expected time-served given prison admission. This means that expected time-served in prison *given conviction* rose sharply during the prison boom.

Prosecutors do not sentence convicted offenders or legislate the range of possible sentences. Holding sentencing policies constant, if prosecutors were to decide to prosecute more marginal cases, we expect that any increase in felony convictions per arrest would be accompanied by a decrease in average time-served per conviction since the new convictions would be associated with marginal cases.

The most natural explanation for the combination of modest increases in convictions per arrest and sharp jumps in average time-served in prison per conviction that we observe is that prosecutors produced more convictions per arrest and more time-served per conviction because changes in sentencing rules gave them greater leverage when negotiating plea bargains. New mandatory-minimum rules, truth-in-sentencing laws, and other sentencing enhancements made it easier for prosecutors to file charges that, given conviction, would likely result in significant prison time, and this additional leverage may well have allowed them to secure more guilty pleas while requiring those who pled guilty to serve significantly more prison time.

¹⁸Category-specific conviction to arrest ratios from 2000 combined with category-specific arrest levels from 1990 give a total convictions to arrest ratio of 19.4 percent, which is only 10 percent greater than the actual rate of 17.7 percent in 1990. If we combine the 1990 conviction to arrest rates and the 2000 arrest levels, we get an overall conviction to arrest rate of 19.4 percent, which is quite close to the 19.9 percent rate that prevails given the actual arrest levels from 2000.

¹⁹This aggregate 84 percent increase is smaller than the changes in admissions per arrests that [Raphael and Stoll \(2013\)](#) report. They report changes in these ratios for seven felony offense categories and two drug arrest categories over the period 1984 to 2004. See Table 2.2 and 2.3. The smallest increase they report is 76 percent for burglary. The other eight increases are greater than 100 percent.

²⁰[Raphael and Stoll \(2013\)](#) also estimate that expected time-served given prison admission increased in each major violent crime category. However, they find no clear pattern among the changes in time-served for other crime categories. Expected time-served increased slightly in some categories and decreased slightly in others. Yet, none of these movements were as significant as the large increases in expected time served for those sentenced for murder, rape, and robbery.

Table 2. Number of Persons per 1,000 Arrests Who Serve Prison Terms of Length s

	0-1 Years	1-2 Years	2-3 Years	3-4 Years	4-5 Years	5+ Years	All Term Lengths
Violent crime:							
Murder and homicide:							
1985	37.84	55.55	45.56	35.58	23.02	239.74	437
2000	31.26	36.96	29.36	25.35	23.87	478.39	625
Ratio	.83	.67	.64	.71	1.04	2.00	1.43
Forcible rape:							
1985	9.01	21.72	22.77	20.68	10.34	38.80	123
2000	11.00	13.36	20.04	13.36	14.93	80.04	153
Ratio	1.22	.62	.88	.65	1.44	2.06	1.24
Robbery:							
1985	26.76	37.75	22.85	14.90	8.61	20.37	131
2000	34.62	37.67	24.78	17.49	13.73	69.76	198
Ratio	1.29	1.00	1.08	1.17	1.60	3.43	1.51
Aggravated assault:							
1985	9.76	11.24	5.59	2.48	1.14	2.75	33
2000	11.74	9.90	4.48	3.26	2.02	6.72	38
Ratio	1.20	.88	.80	1.32	1.77	2.44	1.16
Other assault:							
1985	1.22	1.06	.30	.13	.08	.13	2.9
2000	3.39	3.01	.90	.48	.32	.66	8.8
Ratio	2.77	2.85	2.95	3.74	3.94	5.11	3.00
Property crime:							
Burglary:							
1985	27.14	16.74	7.33	3.24	1.50	3.17	59
2000	40.34	23.49	13.54	6.06	3.89	9.67	97
Ratio	1.49	1.40	1.85	1.87	2.59	3.05	1.64
Motor vehicle theft:							
1985	13.37	5.18	1.46	.45	.16	.59	21
2000	41.74	18.32	5.59	1.81	.97	1.78	70
Ratio	3.12	3.54	3.82	4.01	6.17	3.04	3.31
Larceny or theft:							
1985	6.52	2.73	.82	.40	.14	.38	11
2000	12.74	5.55	2.07	.80	.45	.71	22
Ratio	1.95	2.03	2.53	1.99	3.21	1.88	2.03
Other property crime:							
1985	2.56	1.69	.97	.55	.22	.32	6.3
2000	3.29	2.33	1.00	.55	.35	.89	8.4
Ratio	1.28	1.38	1.02	1.01	1.58	2.84	1.33
Drug crime:							
Drug trafficking:							
1985	29.81	29.96	7.29	2.05	1.21	3.50	74
2000	62.36	59.44	24.84	11.91	6.42	9.45	176
Ratio	2.09	1.98	3.68	5.82	5.31	2.70	2.39

Drug possession or use:							
1985	7.23	2.04	.42	.18	.07	.46	10
2000	21.47	6.92	2.33	.86	.51	.85	33
Ratio	2.97	3.39	5.60	4.80	7.76	1.84	3.17
Other:							
Other sex crime:							
1985	9.71	17.29	13.98	11.00	6.00	19.57	78
2000	21.75	23.70	24.53	12.55	17.28	62.73	163
Ratio	2.24	1.37	1.75	1.14	2.88	3.21	2.10
White-collar crime:							
1985	14.95	5.95	1.74	.70	.23	.41	24
2000	23.07	8.19	3.12	1.17	.57	.68	37
Ratio	1.54	1.38	1.79	1.67	2.49	1.66	1.54
Other crime:							
1985	1.70	.54	.16	.07	.04	.14	2.7
2000	3.12	1.63	.63	.31	.17	.40	6.3
Ratio	1.84	3.00	3.96	4.13	4.89	2.78	2.36
All offenses:							
1985	5.45	3.49	1.52	.83	.43	1.53	13
2000	10.13	6.00	2.74	1.36	.92	3.19	24
Ratio	1.86	1.72	1.81	1.63	2.16	2.09	1.84

Notes: This table is reprinted from [Neal and Rick \(2016\)](#). Arrest records are from Federal Bureau of Investigation (1980–2009); restricted-use data on prison releases and prison populations are from Bureau of Justice Statistics (1984–2009). Population data for generating incarceration rates are from Census Bureau historical population estimates. These results are based on data from California, Colorado, Michigan, New Jersey, South Carolina, Wisconsin, and Washington. “Other” crimes include prostitution, gambling, and vice offenses, driving under the influence and drunkenness, and weapons charges.

[Pfaff \(2017a\)](#) acknowledges that sentencing policies determine the options available to prosecutors when making charging decisions or formulating bargaining strategies in plea negotiations.²¹ However, Pfaff nonetheless discusses these prosecutor behaviors as practices that impact prison admissions rates independently of sentencing policy. This reasoning also puzzles us. The crime classifications, sentencing enhancements, and mandatory minimums that legislators write into law determine the menu of charges that a prosecutor may file against a given arrested offender as well as the punishment threats associated with these charges given conviction. If we assume that, in all eras, many prosecutors further their political careers by increasing the number of offenders they send to prison, then whatever increase in felony convictions per arrest prosecutors achieved during the prison boom may be best understood as a response to new opportunities created by more punitive sentencing policies.

3.2 Changes In Time-Served Per Arrest

[Neal and Rick \(2016\)](#) start their analyses by examining two cohorts of arrested offenders. They take Uniform Crime Reports (UCR) data on arrests in 1985 and in 2000, and then compare the arrest totals in

²¹See [Pfaff \(2017a\)](#) pages 130-131 as an example.

specific crime categories to the prison admission rates for offenders convicted of the same crimes. The data on prison admissions comes from the National Corrections Reporting Program (NCRP). The annual NCRP data contain reports from state corrections agencies to the Bureau of Justice Statistics concerning admissions and releases from state prisons as well as state prison populations.²²

These data do not contain names or other personal identifiers, but they do provide considerable information about the charges that result in each prison admission, the demographics of each prisoner, and the details of the sentence that generated each prison admission. Further, because the release files record the admission date for each released defendant, it is possible to calculate the fraction of prisoners admitted to a specific state prison system in a given month who are released from prison by various dates in the future.

The arrest data from the UCR record the most serious charge against each defendant when he is arrested. In [Neal and Rick \(2016\)](#), we assume that, among those arrested, those who enter prison have been convicted of the most serious charge filed against them and that they enter prison in the year that they are arrested. Given this assumption, we use the UCR and NCRP data to calculate, for each year and each crime category, the probability that a person arrested of a given crime is convicted and serves a particular number of years in prison.

For the cohorts of persons arrested in both 1985 and 2000, Table 2 reports the results of these calculations for prison spells of less than one year, one to two years, two to three years, three to four years, four to five years, and five or more years. The contrast between the results for these two cohorts is striking. For each of fourteen crime categories, the probability of entering prison given arrest increased. Further, among those arrested for non-violent crimes, prison spells of all lengths became more likely, and most of these increases were quite dramatic.²³ Since the likelihoods of serving short, medium, and long prison spells grew among those arrested for non-violent offenses between 1985 and 2000, it is not surprising that the average time-served given admission to prison did not change much among those sentenced to prison for non-violent crimes.

Among those arrested for violent crimes, short prison spells became less likely, but only because the probability of serving five years or more increased by at least a factor of two. For example, the probability that an arrest for robbery would lead to a prison term of at least five years increased by more than a factor of three between 1985 and 2000. For murder, this probability doubled over the same period. Among those convicted of violent crimes, both the likelihood of entering prison and the expected time-served in prison given entry increased sharply between 1985 and 2000.

In section 3.1 above, we explained why available data on convictions per arrest offer no evidence that these changes in expected punishment given arrest could ever be attributed primarily to shifts in prosecutor behavior, but even without those data, we find it hard to imagine how changes in prosecutor priorities could create such dramatic shifts in the distribution of prison time-served among those arrested. We have already noted that the overall rate of prison admissions per arrest increased by 84 percent between 1985 and 2000, but the last row in Table 2 also reports that the probability of serving five years in prison given arrest more than doubled over the same period.

Among the fourteen specific crime categories in Table 2, the per-arrest increases in prison terms of more

²²See [Neal and Rick \(2016\)](#) for details.

²³For example, the probability that a person arrested for motor vehicle theft in 2000 would serve more than one year in prison is more than three times higher than the corresponding probability for those arrested in 1985, and similar results hold for many crime categories.

than five years are all 66 percent or greater, and the increases for all violent crimes, burglary, and motor vehicle theft are greater than 100 percent. Given credits for time-served in jail prior to verdicts and good-time credits awarded during periods of imprisonment, most persons who serve five years in prison are serving nominal prison sentences of ten years or more. [Bellin \(2017\)](#) provides a detailed account of the constraints prosecutors face in our legal system, and given this account, we find it implausible that changes in prosecutor priorities alone could generate a broad and large shift in the likelihoods that arrested offenders receive nominal prison sentences of more than a decade.

Nonetheless, recent work notes that the crime wave of the 1980s and early 1990s could have impacted expected prison time-served per arrest in future decades by creating a large stock of potential offenders with significant criminal histories. [Shen et al. \(2020\)](#) examine data from North Carolina that covers the period 1972 through 2016. They show that the birth cohorts that came of age during the 1980s and 1990s experience high rates of incarceration in their 40s, in part, because these cohorts accumulated lengthy criminal histories by age 40 and because the 1994 Structured Sentencing Act made sentencing more punitive for repeat offenders. [Shen et al. \(2020\)](#) point to this interaction between the criminal records accumulated during a period of rising crime and sentencing reforms adopted in response to this crime wave as a factor that contributed to growth of prisons over time in North Carolina and also kept prison populations elevated through 2016, long after crime and arrest rates in North Carolina began falling.

In related work, [King \(2019\)](#) examines data from Minnesota courts and corrections for the period 1981 to 2013, and he finds that the growth during the 1980s and 1990s of persons with extensive criminal histories contributed directly to the growth in Minnesota prison admission rates given conviction. Even in 1981, judges were more likely to sentence recidivists to prison, so elevated rates of crime during the 1980s and early 1990s created a larger stock of persons who faced a significant risk of receiving a prison sentence given a felony conviction, and [King \(2019\)](#) shows that this growing stock of recidivists contributed to the growth of prison admissions over time in Minnesota even though Minnesota never passed extreme sentencing reforms that mandated prison sentences for many groups of repeat offenders.²⁴

However, [King \(2019\)](#) also shows that more punitive sentencing did directly impact prison admission rates in Minnesota. Defendants facing their first felony conviction saw rising rates of incarceration over time, and in 1981, far more than half of felony convictions involved defendants with no prior felonies. Thus, a significant driver of rising prison admission rates in Minnesota during the 1980s was the rising probability that defendants facing their first felony conviction entered prison.²⁵

Finally, we examine the State Court Processing Statistics (SCPS) reports from 1990 to 2006 that report the fractions of felony defendants in large urban counties who already have at least one felony conviction. For violent offenders and those charged with property crimes, we see little growth in these fractions between 1990 and 2000, but we see slightly more growth between 2000 and 2006. Among defendants charged with drug crimes, we see the fraction with a prior felony conviction grows from 38 percent in 1990 to 44 percent in 2000 and 49 percent in 2006. Among those charged with public order offenses the corresponding ratios are 37 percent, 46 percent, and 47 percent.

The crime wave of the 1980s and 1990s almost certainly affected future prison growth by increasing the

²⁴All else equal, the likelihood of entering prison among convicted felonies with more than one prior felony conviction actually fell over time in Minnesota, but [King \(2019\)](#) does not report how expected time-served given admission changed for these offenders.

²⁵Figure 1 presents the average number of prior felonies by year. The average does not reach 1 until 1985, and [King \(2019\)](#) topcodes the count at 10. Table 3 gives the time-trend in admissions for those convicted with no prior felonies.

fraction of future arrested offenders with prior felony convictions, but no data exist that lead us to conclude that this factor was a major driver of the overall increase in prison time-served per arrested offender. Some of the growth over time in prior felony convictions among those charged with drug crimes and public order offenses likely reflects the impacts of sentencing reforms that increased the number of offenses classified as felonies. Further, the SCPS shifts in the fractions of defendants with prior felony convictions are much smaller than the shifts in expected time-served given arrest implied by the results in Table 2.

3.3 Simulating Prison Populations

The [Neal and Rick \(2016\)](#) results concerning trends in expected time-served given arrest support the claim that shifts during the 1980s and 1990s toward more punitive sentencing policies were a key driver of prison growth. However, these results alone do not reveal exactly how much of the growth of prison populations during the 1980s and 1990s can be attributed to this shift in policy.

To address this “how much” question, [Neal and Rick \(2016\)](#) built a simulation model that employs measures of the probabilities that offenders arrested in 1985 enter prison and remain in prison for 1, 2, ..., 20 years as well as rates of exit from parole to prison and rates of exit from prison following parole revocations. Each of the transition probabilities in this simulation model is specific to one of 84 cells defined by the intersection of offender race, crime category, and location.²⁶ The model allows us to simulate the expected movements of any arrested offender in and out of the prison system under the assumption that the policies that governed sentencing and prison release for offenders in 1985 remained in effect thereafter.

We fed the actual arrest data for the years 1985 to 2005 through this simulation model to create the prison populations that would have been expected in each year between 1986 and 2005 if those arrested in the years after 1985 had faced the sentencing policies faced by those arrested in 1985. The results imply that, in 2005, the incarceration rate would have been just over half of the actual incarceration rate for 2005. Further, 83 percent of the observed growth in incarceration between 1985 and 2005 does not occur in our simulated path of prison populations that holds sentencing parameters fixed at their 1985 values.

Some researchers contend that this approach overstates the impact of changes in sentencing policy on prison growth. The literature on the impacts of sentencing decisions demonstrates that sending more offenders to prison does lower crime rates by incapacitating offenders. Thus, arrest rates may have been higher in the years after 1985 if the 1985 rules governing sentencing, prison release, and parole had remained in place.²⁷ However, [Neal and Rick \(2016\)](#) report that, even when simulations incorporate generous adjustments for this factor, the path of prison populations post-1985 implies that 71 percent of the growth in prison populations between 1985 and 2005 can be attributed to more punitive sentencing policies.²⁸

As our discussion at the end of section 3.2 indicates, these simulation results should overstate the contribution of changes in sentencing policies to prison growth to the extent that, within the 84 cells we define, the typical person arrested possesses a longer criminal history in later years. Even in 1985, most state sentencing guidelines contained some recidivist premiums. Thus, holding 1985 sentencing policies fixed, prison populations would have grown faster than the growth rates implied by our simulations if the

²⁶See [Neal and Rick \(2016\)](#) for details.

²⁷For example, [Raphael and Stoll \(2013\)](#) discuss this issue at length.

²⁸[Neal and Rick \(2016\)](#) employ results from [Levitt \(1996\)](#). [Johnson and Raphael \(2012\)](#), [Raphael and Stoll \(2013\)](#), [Marvell and Moody \(1996\)](#), [McCrary and Sanga \(2012\)](#), and [Owens \(2009\)](#) all report much smaller impacts of incapacitation on crime rates.

population of defendants in our NCRP states contained larger fractions of recidivists over time, as [King \(2019\)](#) found in Minnesota. Given existing data, we do not know how to estimate the size of this bias with any precision. The SCPS data do not begin until 1990, and these data cover only large urban counties. The UCR arrest data do not provide any information about the criminal histories of arrested persons, and one cannot build simulation models that address this concern without access to quite detailed criminal histories, since the details of the histories determine whether various sentencing reforms change the expected sentencing severity facing a given defendant.

3.4 More Decomposition Results

In order to produce the results in [Neal and Rick \(2016\)](#), we made numerous modelling assumptions and many measurement choices. The three most important choices are the following: (a) we estimated parameters for our model that vary by crime category within defendants of a given race, (b) we did not impose steady-state assumptions but instead estimated release rates within these cells for year one, two, three, etc after prison entry, and (c) we did not use all of the data in the NCRP. We only used data from seven states that appear to maintain the best reporting quality of the 1985 to 2005 period.

[Raphael and Stoll \(2013\)](#) also estimated transition parameters that are specific to crime categories and also allow these rates to vary by race. However, they use all of the NCRP data, and they impose a steady-state assumption that allows them to model release rates without modelling the entire distribution of prison spell durations. Their main results compare data from 1984 and 2004, and they conclude that 91 percent of the growth in prison populations between these two years should be attributed to more punitive sentencing policies.

The difference in sample selection rules may explain part of the difference between these results and the [Neal and Rick \(2016\)](#) results. The state of California is part of both simulation models. However, the California data is a much larger component of the [Neal and Rick \(2016\)](#) sample, and California moved to more punitive sentencing earlier than most states. Thus, the [Neal and Rick \(2016\)](#) baseline sentencing policies may be more contaminated by sentencing reforms that took place before the NCRP data begin in 1984.²⁹

In the end, both [Neal and Rick \(2016\)](#) and [Raphael and Stoll \(2013\)](#) produce results that point to the same conclusion. Changes in sentencing policy were the key driver of growth in incarceration rates from the mid 1980s to the mid 2000s.

[Blumstein and Beck \(1999\)](#) examine national trends in offense rates, arrests per offense, prison admissions per arrest, and expected time served among admitted prisoners for six different crime categories: murder, robbery, assault, burglary, drugs, and sexual assault. They employ data from 1980 to 1996 and conclude that 88 percent of the growth in state prison populations from 1980 to 1996 can be attributed to growth in the rates of prison sentences per arrest as well as growth in time-served given entry into prison. This decomposition does not exploit variation in trends among states or model transitions from parole back to prison for technical violations, but the authors reach a conclusion that echoes the findings in both [Neal and](#)

²⁹[Neal and Rick \(2016\)](#) address the possibility that, absent changes in sentencing policy, arrest rates would have been higher post-1985 by making extreme adjustments to the arrest series. [Raphael and Stoll \(2013\)](#) estimate their own adjustment factor, and the factor they employ is smaller and more in line with the typical result in the literature on how crime rates respond to sudden changes in incarceration rates.

Rick (2016) and Raphael and Stoll (2013). An increase in the severity of punishment drove the sharp rise in prison populations after 1980. Trends in crime and arrest rates make a small contribution to the growth in incarceration rates over this period.

Neal and Rick (2014) provide a more detailed discussion of the methodological differences that distinguish the work of Neal and Rick (2016), Raphael and Stoll (2013), Blumstein and Beck (1999), and some other contributions to this literature. However, no research has concluded that the growth of incarceration rates during the 1980s and 1990s should have been expected based on trends in crimes and arrests alone. Prison populations grew because both state and federal courts increased the rate at which arrested offenders entered prison to serve short, medium, and long prison terms. It is not possible to know what portion of the shift to more punitive sentencing resulted from new laws that required judges to impose more severe sentences versus new guidelines that encouraged judges to be more punitive or growing political pressures for judges to be tough on crime. However, Neal and Rick (2014) document large and numerous changes in state laws that required more punitive sentencing or placed restrictions on the early release of prisoners.³⁰

Before turning to an agenda for reform, it is worth noting that Neal and Rick (2016) find that changes in sentencing policy contributed slightly more, in percentage terms, to the growth of incarceration rates among Whites between 1985 and 2005 than to the growth of incarceration rates among Blacks. This result does not imply an absence of racial bias in sentencing in state courts. It simply means that the move to more punitive sentencing did not make any racial biases that existed in the early 1980s worse. Further, a similar result does not hold for the federal system. A number of studies have documented racial bias in the federal war on drugs.³¹

4 Reversing Course

In this chapter, we confine our analysis mostly to the period 1980 through 2019. Detailed data on the case and defendant characteristics associated with prison admissions and releases is not widely available before the 1980s, and the COVID pandemic shocked many aspects of the criminal justice system in 2020. Public health concerns surrounding the operation of prisons, jails, and courts generated a significant reduction in prison populations. Further, violent crime rates rose and homicide rates soared while clearance rates fell sharply. It is hard to predict how these events will shape criminal justice policies going forward or how prison populations will evolve in the future.

Nonetheless, Figure 3 documents that, from 2008-2019, incarceration rates fell. Rates of incarceration in jails, federal prisons, and state prisons dropped during the 2010s, and while all three rates remain quite high by historical standards, all three declines are noteworthy.³² Here, we discuss reforms that appear to have contributed to these declines and may foster additional declines in the future.

In 2010, there were just over 1.4 million prisoners in state prisons. In 2019, there were roughly 1.25 million. The state of California contributed disproportionately to this decline: In 2010, California held roughly one in ten prisoners assigned to state correctional institutions, but more than one fourth of the roughly 150,000 prisoner decline in total state prison populations is attributable to a reduction of more than 40,000 in the

³⁰Stemen et al. (2006) report that all fifty states adopted new mandatory sentencing laws at some point between 1975 and 2002. Further, between 1994 and 1998 alone, twenty two states adopted a Truth-In-Sentencing law that restricted early release.

³¹Alexander (2012) is among the most well known contributions to this topic.

³²For example, the incarceration rate in state prisons fell by just over 15 percent from 454 to 382 between 2010 and 2019.

California State prison population.³³ California was among the first states to adopt policies that made sentencing more punitive for a broad range of offenders, and since 2010, California has taken the most aggressive steps to reduce its prison population.

Before going into the details of reform in California, we note that the timing of criminal justice policy changes in the state likely did not reflect a sudden change in public sentiment about the merits of punitive sentencing regimes. Two external factors worked together to make reducing prison populations a high priority for state officials. First, in 2008 and 2009, the Great Recession placed serious financial strain on the state.³⁴ Then, in 2010, the US Supreme Court ruled, in *Brown v Plata*, that California prisons were so overcrowded that inmates were denied constitutional protections against cruel and unusual punishment, and the Court upheld a lower court ruling that limited the ratio of prisoners in a given facility to 137.5 percent of its design capacity. As a result, the state had to quickly build new prisons, find new facilities that would accept some of their prisoners, or release tens of thousands of inmates.

Given the hole in the state budget created by the Great Recession, any path forward that involved sharp increases in prison spending faced serious political obstacles. So, in 2011, California passed the Public Safety Realignment Act (PSRA). The key provisions of the act granted judges more discretion to assign punishments other than prison to some offenders, designated certain less serious offenses for punishment by, at most, short spells in county jails, and greatly restricted the practice of returning parolees to prison when they violate technical conditions of their supervision.

The PSRA law generated a swift and lasting reduction in the incarceration rate. After one year, the state incarceration rate was 18 percent lower. This rate did not increase in the following year, and the increase in county jail populations offset only about one-third of this reduction in incarceration.³⁵

[Lofstrom et al. \(2014\)](#) and [Lofstrom and Raphael \(2016\)](#) examine the implementation of the PSRA and its impacts on incarceration and recidivism. Two conclusions stand out. First, there is no evidence that the reform generated a spike in violent crime and little evidence that it caused an increase in property crime. This result may be expected since the reform sought to target lower-level offenders for punishments other than prison. Further, while [Lofstrom and Raphael \(2016\)](#) point out that these results conflict with several earlier studies that found larger impacts of reductions in prison populations on crime rates, they offer an obvious explanation for the contrast. By 2010, California has spent decades sending people to prison for relatively minor offenses. So, legislators could generate large reductions in prison populations without reducing the punishment assigned to the most serious offenders.

Second, before the reform, parole officers in California sent thousands of parolees per year back to prison for technical violations of parole rules rather than new criminal activity. Some may think that these parole revocations should enhance public safety. If parole officers are skilled at discerning when technical violations are a leading indicator of subsequent criminal behavior, then granting them the power to revoke parole for technical violations could reduce crime rates. However, [Lofstrom et al. \(2014\)](#) find little evidence that California parole officers exercised their pre-reform discretion in ways that enhanced public safety. The number of parole revocations plummeted after 2011, but recidivism among recently released prisoners changed little.

³³See [Guerino et al. \(2012\)](#) and [Carson \(2020\)](#).

³⁴See <https://dof.ca.gov/wp-content/uploads/budget/publications/2009-10/FullBudgetSummary.pdf>

³⁵See [Lofstrom and Raphael \(2016\)](#) pp.202-204.

This finding echoes results from more recent research. Using data from Michigan and Illinois, [Harding et al. \(2017\)](#), [Franco et al. \(2020\)](#), and [Jordan et al. \(2022\)](#) find that parole revocations for technical violations generate sizeable flows into prison. Further, [Rose \(2020\)](#) finds that probation officers in North Carolina, who are able to initiate revocations that generate prison admissions, do not target probationers who possess greater than average risks to public safety.

To date, California is the only state that has implemented reforms that created such a large reduction in prison populations in such a short time, and many states have seen only small changes or even growth in state incarceration rates since 2010. However, [Schrantz et al. \(2018\)](#) report that over the period 2008 to 2016, five states that implemented numerous reforms did see significant reductions in state prison populations. Connecticut, Michigan, Mississippi, Rhode Island, and South Carolina are different demographically and politically, but all saw significant declines in state incarceration rates over this period.

No careful decomposition analyses exist that parcel out what part of these declines in prison populations can be linked to specific policy changes, and with the exception of Mississippi, all five states saw significant decreases in crime rates or arrest rates while their incarceration rates were falling. However, these states did adopt reforms that resembled some of the steps taken in California. All five introduced reductions in the penalties recommended or required for lower level offenses. All five reformed their parole systems, and all but Rhode Island took steps to limit returns to prison associated with technical violations.

5 Conclusion

Changes in how courts and parole authorities process, sentence, release, and monitor offenders created the prison boom. However, one could argue that secular changes in violent crime rates may have created political momentum for the punitive criminal justice reforms that began in the 1970s and continued in the 1980s and 1990s. In 1960, the US homicide rate was around 5 per 100,000 persons. By the mid-1970s, the homicide rate had almost doubled. For the next 20 years, the rate fluctuated between 7.9 and 10.2 before trending downward over the subsequent 20 years. In 2014, the homicide rate reached a low point for this century of 4.4. Since then, the rate has been rising again. It was 5.1 in 2019 and 6.5 in 2021.³⁶

Homicide rates are only one measure of crime, but existing data sources measure homicide rates more accurately than most other crimes, and news media devote significant attention to homicides as indicators of the level of violence in society. Further, violent crime rates as a whole also rose sharply in the 1970s and continued trending upward through the early 1990s. Looking back, it would have been surprising if there had been no political momentum for more punitive sentencing of violent offenders during the 1980s and 1990s.

However, as [Neal and Rick \(2016\)](#) stress, the shift to more punitive criminal justice policies involved more than efforts to protect the public from violent criminals. While violent criminals faced longer expected spells in prison, Table 2 also shows that other changes in sentencing policies dramatically increased the likelihood that those arrested for all manner of non-violent crimes would serve prison time, and these changes matter for the growth of prison populations. The outcomes that followed PSRA implementation in California demonstrate that it is possible to generate meaningful reductions in prison populations by

³⁶See <http://www.ojp.usdoj.gov/bjs/homicide/tables/totalstab.htm> for historical data on US homicide rates based on the FBI Uniform Crime Reports.

reducing the punishments that offenders receive for low-level offenses and by eliminating parole revocations for technical violations of supervision conditions, and so far, there is no evidence that these reforms created serious harms to public safety.

5.1 Low Hanging Fruit

We see no reason that other states should refrain from following the steps that California has already taken. The results from this policy experiment should encourage other states to seek policies that do not permit prison time as punishment for low-level offenses. Further, it makes sense to not only eliminate the opportunities for parole officers to send parolees back to prison for technical violations but also to re-imagine the duties and job design of those who supervise recently released prisoners. Many states hire former correctional officers or police officers to serve as parole officers. It is possible that social workers or other professionals with different prior training may do a better job of helping released offenders establish stable housing, stable employment, and stable family lives in healthy communities. Further, given the results in [Harding et al. \(2017\)](#), [Rose and Shem-Tov \(2021\)](#), [Franco et al. \(2020\)](#), and [Jordan et al. \(2022\)](#), there is no reason to believe that social workers would do a worse job of identifying the persons under community supervision who pose particular threats to public safety.

Policy makers must also note that prison populations are significantly older now than in previous decades. The number of inmates serving sentences that likely require them to spend all or almost all of their remaining years in prison increased as a result of the sentencing reforms that created the prison boom. In 1991, more than four out of five inmates in state and federal prisons were younger than 40, but this fraction has declined steadily to about 55 percent in 2020. In addition, the fraction of prisoners age 55 and older more than quadrupled from 3.4 percent in 1991 to 14 percent in 2020.³⁷

Studies of recidivism by demographic group point to a strong negative relationship between age at release and subsequent rates of re-arrest, re-conviction, and return to prison. In particular, re-arrest rates for violent offenses are much lower among former prisoners older than 40 at time of release than among those younger than 29, and the same pattern holds for re-conviction and return to prison.³⁸

Sentencing reforms and reforms to parole can reduce the flow of persons into prisons that are not grave threats to public safety, but in order to return incarceration rates to levels that are close to those in other developed countries or to the rate that existed in the US in 1970, corrections officials will need to grant early release to some elderly prisoners who are serving extremely long sentences. This task requires great care. Aged is not a synonym for harmless, and there are segments of the public who contend that justice requires life in prison as the punishment for certain offenses. Nonetheless, the dramatic change in the age distribution of the prison population suggests that progress is possible on this policy margin.

5.2 A More Controversial but Possibly Consequential Reform

Policy makers should pay close attention to the stock of persons who are incarcerated for “possession” offenses. Scholars and activists have begun to stress that the War on Drugs created a situation where police officers could go out and search for people to arrest and place at risk of imprisonment without

³⁷See [Gilliard and Beck \(1998\)](#) and [Carson \(2021\)](#)

³⁸See Table 4 in [Durose et al. \(2014\)](#) and Table 8 in [Langan and Levin \(2002\)](#).

receiving any report that these persons had harmed someone else. As a result, the federal government and some states have adopted reforms that reduced penalties for drug offenses.³⁹ However, in some jurisdictions, a War on Weapons appears to be replacing the War on Drugs, and it may justify similar cause for concern. Data from the state of Illinois show that, in July of 2019, 5.6 percent of the more than 39,000 prisoners in state correctional institutions were serving time for possessing weapons unlawfully. These prisoners were not serving time for having used a weapon in a criminal act but rather for simply possessing a weapon when something about their criminal history had made them ineligible to secure a weapons permit. In fact, two of the top five holding offenses in Illinois prisons in 2019 were weapons possession offenses. The other three were murder, sexual assault, and attempted murder.

Many mayors of large cities and the federal government are stressing the need to “get guns off the street.” However, laws that mandate prison time for those who possess weapons without permits also provide a path to prison for persons who long ago desisted from engaging in traditional crimes but may still possess a weapon for personal protection because they live in a high-crime area. Further, all of the more than 2,000 persons serving time for weapons possession in Illinois in July 2019 were prisoners without victims. They were not serving time because they injured someone, stole from someone, or committed fraud against someone.⁴⁰

US Prison populations are enormous by any standard, in large part, because policy makers responded to rising crime in the 1960s and 1970s by adopting laws and policies that sent many offenders to prison who would not have gone to prison in earlier periods. Policy makers also made sure that many violent offenders would grow old or die in prison. It is difficult, if not impossible, to know how much these policy choices contributed to the declines in crime after the mid-1990s. No one knows exactly how potential offenders form beliefs about the consequences of their actions or the lag between changes in sentencing policy and the salience of these changes. Nonetheless, policy makers likely can pursue many reforms to sentencing guidelines, parole, and parole supervision that should permit a significant reduction in incarceration rates without causing serious harm to public safety.

³⁹For instance, The Fair Sentencing Act of 2010 on the Federal level; The Control, Regulate and Tax Adult Use of Marijuana Act in California (2016); Senate Bill S6579A and The Marijuana Regulation and Taxation Act in New York (2019).

⁴⁰See <https://idoc.illinois.gov/reportsandstatistics/populationdatasets.html>

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