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Explaining the Past and Projecting Future Crime Rates

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Abstract

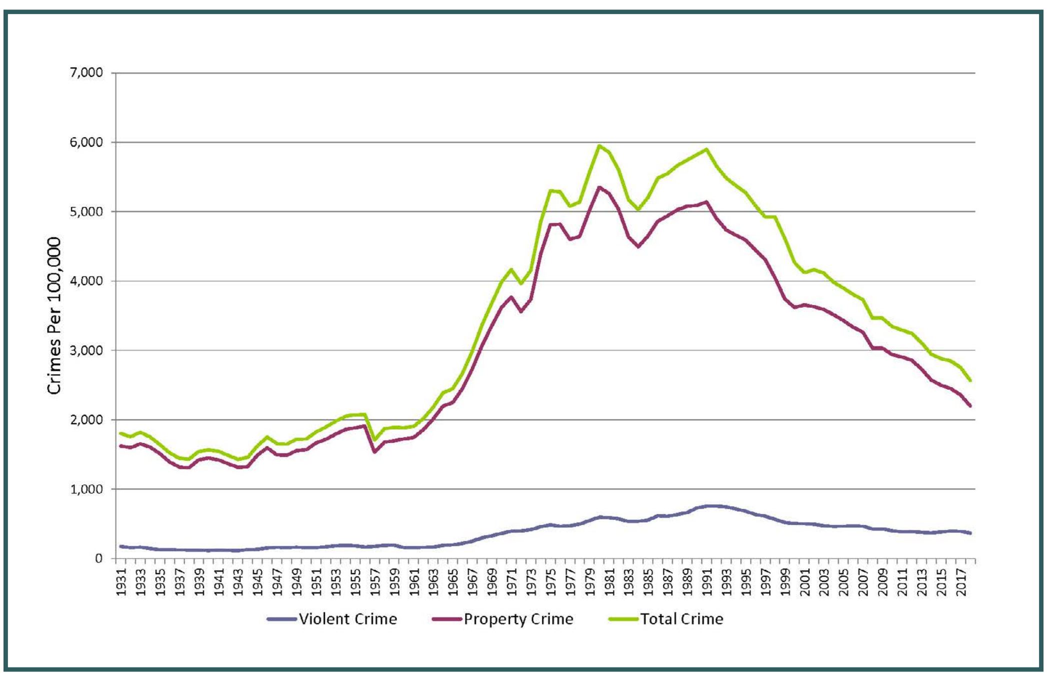
To date criminologists have a poor record of anticipating future crime rates. As a result, they are ill-equipped to inform policy makers about the impact of criminal justice reforms on future crime. In this report, we assess the factors that explain changes in crime during the past three decades. Our analysis shows that macro-level economic and demographic factors best explain trends in violent and property crime. Together, those factors outweigh the impact of imprisonment rates on crime. We also show that it is possible to lower imprisonment rates without causing an increase in crime. Indeed, several states have done exactly that. Finally, we present models for projecting future crime rates. Based on these models, crime is projected to decrease over the next five years. The next step should be to apply similar analyses to individual states and local jurisdictions to advise policy makers on the implications of their criminal justice reform strategies for public safety.

Introduction

Major changes in America's crime rates have occurred since the mid-1960s. After several decades of relative stability, a significant unanticipated uptick in crime began in 1965, reaching historic peaks in the early 1980s and then again in the early 1990s. During this period crime rates more than tripled. However, suddenly and just as unexpectedly, crime then began to decline rapidly, reaching its lowest level since 1966 (Figure 1). Today, it is unclear whether crime rates will continue to decline, stabilize, or begin to increase. Most research to date on understanding crime rates in the United States and elsewhere has been limited to identifying factors that are associated with past crime rates (Rosenfeld 2011). Much less attention has been devoted to projecting future crime rates.

There are several problems with these studies of changes in crime rates. First, criminologists have been unable to develop statistical models that would have predicted the sudden rise and fall in crime. While accounting for past crime trends is an important exercise, of greater value to society and policy makers would be methods for projecting future crime rates based on assumptions about a small set of key factors, some modifiable through policy and some not, that research has shown to have influenced crime trends.

FIGURE 1. UCR CRIME RATES, 1931–1981



Second, these studies have not paid sufficient attention to macro-level economic factors such as inflation rates and consumer confidence and socio-demographic factors (e.g., fertility rates, household size) that hold some promise for projecting crime rates into the future (Rosenfeld and Levin 2016).

Third, such models have narrowly tried to factor in the impact of the criminal justice system (e.g., incarceration rates, size of police forces) to estimate what changes in criminal justice policy can serve to increase or decrease crime rates. For example, Levitt (2004) argues that increases in the size of city police forces contributed to the sustained U.S. crime drop that began in the early 1990s. Conversely, Sharkey, Torrats-Espinosa, and Takya (2017) found that the increased presence of community-based organizations in high crime neighborhoods reduces crime rates and may have supplanted the impact of law enforcement in such communities.

Fourth, on the incarceration side, most studies have claimed that the higher imprisonment rates that began in the 1970s were at least partially responsible for the subsequent reductions in crime that began in the early 1990s (e.g., Levitt 1996, 2004). These studies focus on imprisonment rates as the sole criminal-justice variable, however, and ignore the three other major forms of correctional control: probation, parole, and jails. When the effects of these other forms of correctional control are added to any statistical model, the impact of state imprisonment rates cannot be reliably estimated because, as we will show, all four forms of correctional control are highly interrelated.

In addition, rising imprisonment rates seem to have "diminishing returns" for crime reduction (Gainsborough and Mauer 2000; Stemen 2007). At least one study found that, after a certain point, increased imprisonment rates may actually increase crime (Vieraitis, Kovandzic, and Marvell 2007).

The impact of incarceration policy (both jails and prison) on crime is particularly relevant today as state and local governments are being urged to lower their jail and prison populations. Policy-makers need confidence that reductions in their correctional populations will not increase their crime rates. Forecasting models in criminal justice have been largely limited to estimating the impact of sentencing reforms and administrative policies (e.g., parole-board grant rates, good-time-credit awards) on the size of correctional populations. Efforts to estimate the impact of such reforms on crime rates are almost non-existent. A recent exception is a study commissioned by the state of Illinois on how to safely reduce its prison population by 25%, which showed that such a reduction could be achieved without increasing crime (Austin et al. 2017).

A Primer on Crime Rates and Crime Trends

There are two methods for measuring crime in the United States. The longest-standing method is through the FBI's Uniform Crime Reports (UCR), which has been collecting data since 1931. The UCR is based only on incidents of the following crimes reported to and recorded by the police:

1. Murder
2. Rape
3. Robbery
4. Aggravated Assault
5. Burglary
6. Larceny
7. Auto Theft
8. Arson

The UCR crime rate is expressed as crimes per 100,000 U.S. population as reported by the U.S. Census. The conventional use of a rate using large numbers—crimes per 100,000—tends to obscure the fact that the risk of being victimized by a serious crime is low. For example, the 2017 crime rate was 2,756 per 100,000, which means that only 2.7% of the U.S. population reported experiencing one of the eight UCR crimes recorded by police that year (or less if some persons reported more than one crime).

Several major trends shown in Figure 1 should be emphasized. First, rates were relatively stable and low (under 2,000 per 100,000) from 1931 until the 1960s, when they began to rise, reaching a peak of 6,000 per 100,000 by the early 1980s. While this represents a three-fold increase in the crime rate, it also means that at its highest peak, at most 6% of the U.S. population reported a serious crime to police each year.

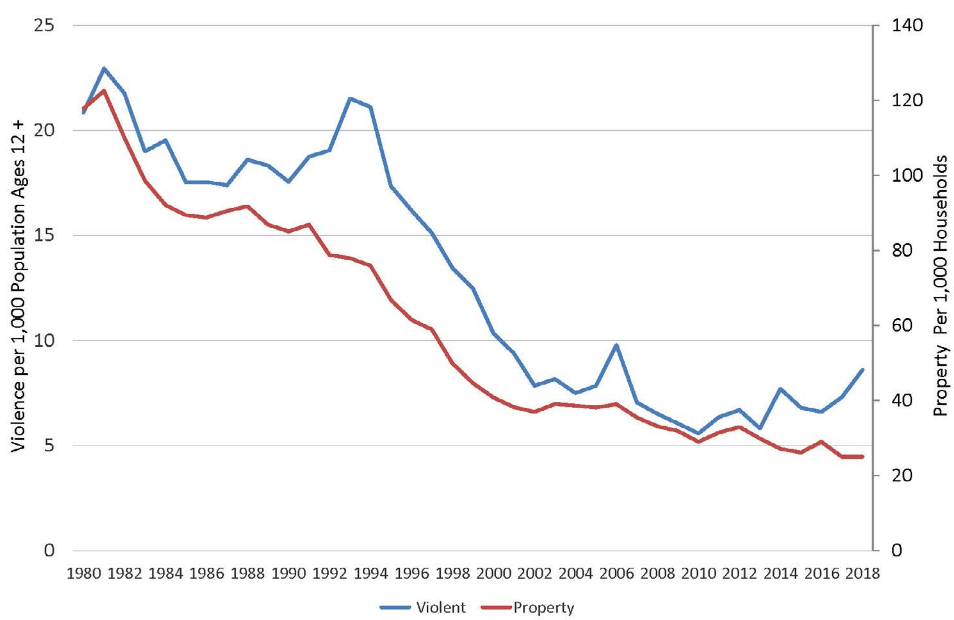
Second, the vast majority (about 85% of the total crime rate) of UCR crimes are non-violent offenses, mainly larceny theft (about 60% of the total). The violent crime rate (mostly aggravated assault and robbery) peaked in 1991 at 758 per 100,000, meaning that, at its highest point, only eight-tenths of one percent of the U.S. population reported a violent crime to police.

Finally, as mentioned, after a dramatic rise that began in the early 1960s and peaked in the early 1980s and again in the early 1990s, the UCR rates have steadily declined since the early 1990s. As of 2017, they had declined to the rates of 1966.

A major benefit of the UCR is that it allows local jurisdictions to measure their own crime rate and compare it with others. But because the data reflect incidents reported to and recorded as crimes by the police, they do not include crimes unknown to the police. To correct for this limitation, the Bureau of Justice Statistics of the U.S. Department of Justice began a new crime reporting program in 1973 that is based on a national survey of U.S. households. Known now as the National Crime Victimization Survey (NCVS), this survey counts all crimes against members of the sampled household who are 12 years or older.[1]

There are important differences and similarities between the extent of crime as measured by the UCR and the NCVS. The NCVS does not include homicide. UCR rates are lower than NCVS rates because many crimes, especially minor ones, are not reported to police. A major reason for the lower numbers in the UCR is that many of the crimes reported in the NCVS involve little to no economic loss or injury and are thus less likely to motivate victims to report them to police.

FIGURE 2. NCVS RATES, 1980–2018



1 BECAUSE IT IS A NATIONAL SURVEY, IT IS NOT POSSIBLE TO MEASURE CRIME RATES FOR LOCAL JURISDICTIONS AND STATES. THE BUREAU OF JUSTICE STATISTICS IS CURRENTLY DEVELOPING METHODS TO ESTIMATE STATE-LEVEL VICTIMIZATION RATES.

Despite these differences, the NCVS shows the same downward trajectory as the UCR data since the early 1980s and, for violent crime, the early 1990s (Figure 2). And the same lessons emerge: the annual probability of a U.S. resident being a victim of any crime is low—extremely low for a violent crime—and victimization risk has dropped dramatically since the early 1990s. For example, the probability of being victimized for a violent crime as measured by the UCR is now only four-tenths of one percent. For property crime (burglaries, larcenies, and motor vehicle thefts) the risk is now 2.5%.

The NCVS shows that the probability of being victimized for a serious violent crime (aggravated assaults, robberies, and rapes) each year is now six-tenths of one percent for the population age 12 and older. The chance that a household will be victimized by a burglary or auto theft is now 2.7%. In short, the chance of being a victim of a crime documented by the UCR or NCVS is lower than at any point during the past half century. It goes without saying that criminologists failed to anticipate both the rapid ascent and equally dramatic decline in crime rates of the past several decades. The factors that have driven crime to such low levels and whether these downward trends will continue are the subject of the remainder of the report.

Explaining the Fall in U.S. Crime Rates

To explain why U.S. crime rates have declined so rapidly, we gathered national data on variables that, based on past research, might have influenced national crime rates (both UCR and NCVS) during our study period, 1980 to 2016. The variables include demographic, social, and economic conditions, as well as state and federal imprisonment rates. We also collected data on the other portions of the U.S. correctional population – probation, jail, and parole populations. We do not include these correctional indicators in our statistical analyses, however, because, as mentioned, it is very difficult to distinguish the impact of the prison population on crime rates from that of probation, jail, and parole.

Any statistical model of crime rates is intended to explain why rates change from year to year. This is typically accomplished with a multiple-regression statistical analysis. Such a quantitative model is able to estimate the independent effect of each of a number of variables.

Our objective was to develop regression models with the strongest fit to the year-to-year variation in violent and property crime rates between 1980 and 2016. We do not attempt to explain why the UCR crime rates began to rise in the mid 1960s until they plateaued in 1980. This is because many of the variables we examine are not readily available prior to 1980. And the NCVS, which is considered to be a more comprehensive reading of crime, did not exist prior to 1973.

The national-level analyses we conducted are meant to provide guidance to policymakers in estimating the impact on crime of reforms intended to reduce correctional populations. But criminal justice policy is enacted primarily at the state and local level. To be of practical utility, such analyses should be carried out using data for states, counties, and cities. The specific conditions that affect crime rates in these jurisdictions may differ from those associated with national-level crime rates. The national-level analyses illustrate the logic and methods that should inform comparable analyses carried out at lower geographic levels. We present preliminary state-level analyses of the impact of imprisonment levels on crime rates later in this report.

We carried out the national-level analyses using the UCR violent and property crime rates; prior research on crime and imprisonment trends has almost exclusively been based on the UCR data.[2]

2 WE REPLICATED THESE ANALYSES ON NCVS VIOLENT AND PROPERTY CRIME TRENDS OVER THE SAME PERIOD. THE MODEL SPECIFICATIONS DIFFERED SOMEWHAT. OVERALL, HOWEVER, THE RESULTS WERE SIMILAR TO THOSE BASED ON THE UCR CRIME DATA REPORTED HERE.

The best-fitting model for explaining the UCR violent crime trends (Figure 3) consisted of five factors: the inflation rate, the teen birth rate, the divorce rate, the percentage of the population between the ages of 18 and 24, and the imprisonment rate (state plus federal). Past research has shown that these measures are significantly associated with changes in violent crime rates (e.g., Colen, Ramey, and Browning 2016; Rosenfeld and Levin 2016; Travis, Western, and Redburn 2014:146-150).[3] The inflation, teen birth, and divorce rates are positively associated with the violent crime rate (Table 1). (As inflation, teen birth, and divorce rates increase, the violent crime rate increases; as they decrease, the violent crime rate decreases.) The percentage of the population between 18 and 24 is negatively related to the violent crime rate.[4]

TABLE 1. FACTORS ASSOCIATED WITH UCR VIOLENT CRIME RATE, 1980-2016

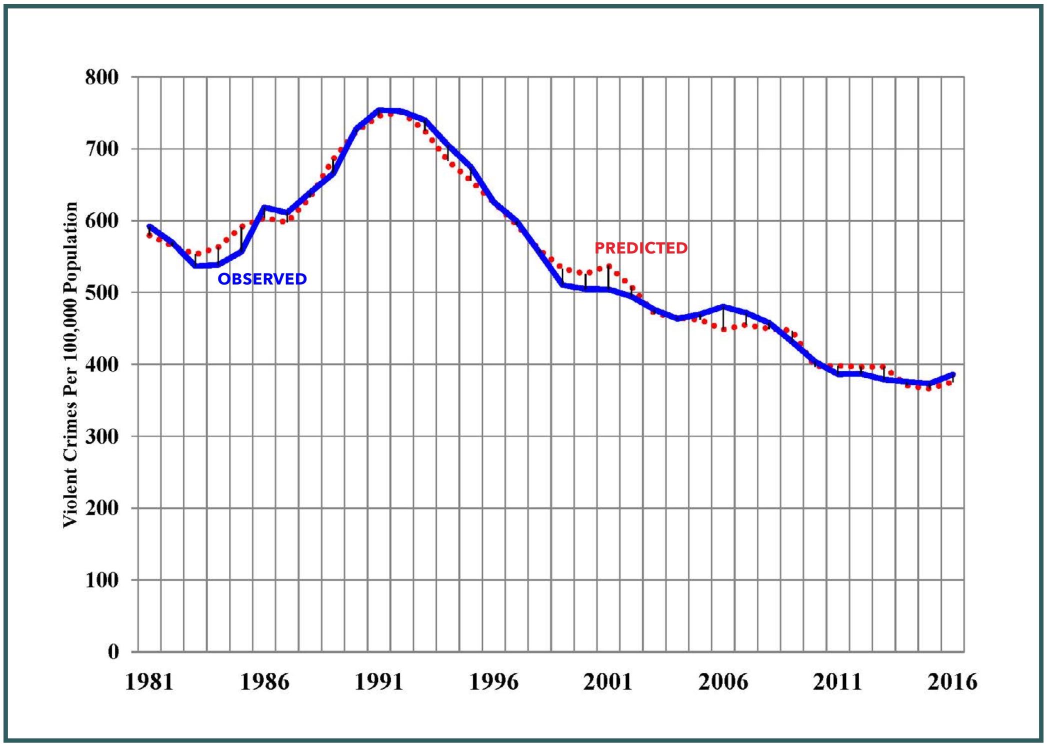
Factor	b-Slope	Standard Error
Inflation Rate (lagged)	5.344*	1.934
Teen Birth Rate (lagged)	10.115*	.929
Divorce Rate (lagged)	72.514*	18.647
% 18–24	–93.616*	19.155
State and Federal Imprisonment (lagged)	–1.498*	.156
R Square (Variance Explained)	98%	
Without State and Federal Imprisonment Rate	77%	
F-Test of Overall Significance	173.2*	

***P < .01**
NOTE: PRAIS-WINSTEN REGRESSION. INDEPENDENT VARIABLES, EXCEPT %18-24, ARE LAGGED ONE YEAR.

VARIABLE DEFINITIONS
VIOLENT CRIME RATE = SUM OF UCR HOMICIDES, RAPES, ROBBERIES, AND AGGRAVATED ASSAULTS PER 100,000 POPULATION
IMPRISONMENT = STATE AND FEDERAL PRISONERS PER 100,000 POPULATION
INFLATION = YEARLY PERCENTAGE CHANGE IN CONSUMER PRICES
TEEN BIRTH RATE = BIRTHS PER 1,000 FEMALES AGE 15-19
DIVORCE RATE = PERCENTAGE OF THE POPULATION AGE 15 AND OLDER DIVORCED
% 18-24 = PERCENTAGE OF THE POPULATION BETWEEN 18 AND 24 YEARS-OLD

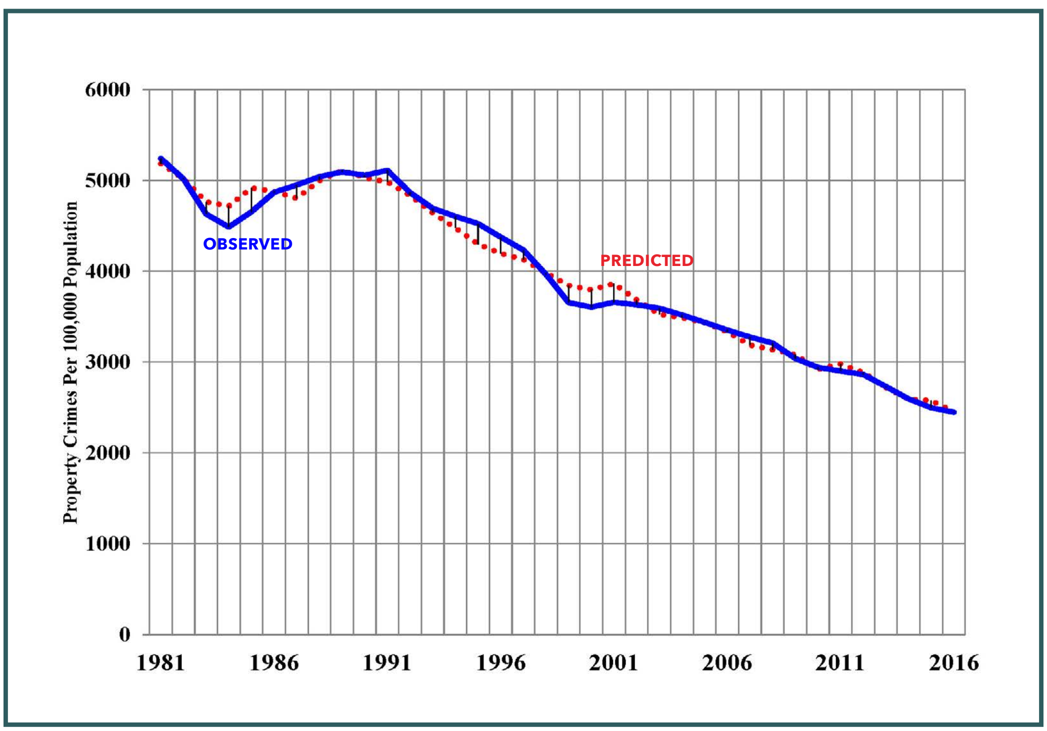
3 TO CORRECT THE ESTIMATES FOR AUTOCORRELATION, WE ESTIMATED THE MODELS WITH PRAIS-WINSTEN (AR1) REGRESSION.
4 AS THE FRACTION OF THE POPULATION IN THE 18-24 SEGMENT HAS FALLEN, WE MIGHT HAVE EXPECTED THE VIOLENT CRIME RATE TO *DECREASE*, BECAUSE OFFENDING TENDS TO PEAK DURING YOUNG ADULTHOOD. HOWEVER, FOR THE PERIOD OF OUR STUDY, 1980-2016, WE FOUND A NEGATIVE RELATIONSHIP. A PROBABLE EXPLANATION IS THAT THE RATE OF YOUTH VIOLENCE SHOT UP DURING THE CRACK ERA OF THE LATE 1980S AND EARLY 1990S, EVEN AS THE YOUTHFUL COHORT OF THE POPULATION WAS SHRINKING (COOK AND LAUB 1998). THE CORRELATION BETWEEN THE PERCENTAGE OF THE POPULATION BETWEEN 18 AND 24 AND THE VIOLENT CRIME RATE WAS THUS STRONGLY NEGATIVE DURING THE 1986-1992 CRACK ERA. EVEN THOUGH THE RELATIONSHIP WAS POSITIVE BOTH BEFORE AND AFTER THAT BRIEF PERIOD, THE NET RELATIONSHIP OVER THE 1980-2016 PERIOD WAS NEGATIVE.

FIGURE 3. OBSERVED AND PREDICTED VIOLENT CRIME RATE, 1981–2016



$R^2 = 0.982$

FIGURE 4. OBSERVED AND PREDICTED PROPERTY CRIME RATE, 1981–2016



$R^2 = 0.984$

With regard to UCR property crime rates (burglaries, larcenies, and motor vehicle thefts per 100,000 population) (Figure 4), the best-fitting model includes the inflation rate, the percentage of the population between 18 and 24, the percentage of the labor force in manufacturing jobs, and a measure of educational attainment—the percentage of the population age 25 and older with a bachelor's or higher degree (Table 2).

TABLE 2. FACTORS ASSOCIATED WITH UCR PROPERTY CRIME RATE, 1980-2016

Factor	b-Slope	Standard Error
Inflation Rate (lagged)	58.427*	12.086
% Bachelor's or Higher Degree	–356.858*	56.207
Proportion in Manufacturing	–25326.330*	8599.319
% 18–24	–675.997*	112.063
State and Federal Imprisonment (lagged)	–6.439*	1.409
R Square (Variance Explained)	98%	
Without State and Federal Imprisonment Rate	93%	
F-Test of Overall Significance	238.3*	

***P < .01**
NOTE: PRAIS-WINSTEN REGRESSION

VARIABLE DEFINITIONS
PROPERTY CRIME RATE = SUM OF UCR BURGLARIES, LARCENIES, AND MOTOR VEHICLE THEFTS PER 100,000 POPULATION
% BACHELOR'S OR HIGHER DEGREE = PERCENTAGE OF THE POPULATION AGE 25 AND OLDER WITH A BACHELOR'S OR HIGHER DEGREE
PROPORTION IN MANUFACTURING = PROPORTION OF THE LABOR FORCE IN MANUFACTURING JOBS

Decreases in the property crime rate are associated with decreases in inflation, increases in the fraction of the population with a bachelor's or higher degree, increases in manufacturing employment, and increases in the percentage of the population between 18 and 24.

In both models the imprisonment rate is inversely related to the crime rate between 1980 and 2016. However, its influence is weaker than that of the non-imprisonment factors. With the imprisonment rate omitted from the models, the other predictive factors in the violent crime model explain 77% of the variation between 1980 and 2016 in violent crime, and the other property crime variables explain 93% of the variation in property crime.

We have not attempted to incorporate the associated effects of levels of probation, jail, and parole populations in these models, even though some of the effect of the imprisonment rate on crime is undoubtedly shared with these other forms of correctional control. Finally, even though the effect of imprisonment on crime is statistically significant (i.e., not reasonably attributable to chance), it does not follow that reductions in imprisonment will inevitably lead to increases in crime. This is because the other factors associated with crime are not static. They also change over time, and the effects of those changes outweigh the effects of comparable changes in imprisonment rates. The next section of the report provides further analysis of the effects of imprisonment on crime rates.

A Closer Look at the Imprisonment Rate Factors

Measures to reduce the U.S. prison population have picked up speed over the past several years and finally reached the federal level in the First Step Act, passed by Congress in December 2018. The chief criticism of the First Step Act and other reforms designed to reduce imprisonment was that lowering the prison population would necessarily increase crime rates. This argument is grounded in the key assumption that national crime rates are driven to a great extent by the size of the state and federal prison systems. It is inconceivable to many policy makers that both crime and incarceration rates could be simultaneously reduced.

We now have clear evidence that lowering state and federal imprisonment rates will not necessarily trigger increases in crime. As shown in Table 3, there are several states where prison populations have been lowered by over 20% and crime rates have also declined by substantial amounts. Leading the imprisonment rate reductions are New Jersey (38% reduction) and New York (32% reduction).

TABLE 3. PRISON POPULATION AND CRIME RATE REDUCTIONS IN NEW YORK, CALIFORNIA, NEW JERSEY, AND MARYLAND

	NY	CA	NJ	MD
Year Reforms Initiated	1999	2006	1999	2008
Prison Population Before Reform	72,899	175,512	31,493	23,239
2017 Prison Population	49,461	131,039	19,585	19,367
Prison Reduction	–23,438	–44,473	–11,908	–3,872
% Reduction	–32%	–25%	–38%	–17%
UCR Crime Rate Before Reform	3,279	3,743	3,400	4,126
2017 Crime Rate	1,871	2,946	1,785	2,722
Crime Rate Reduction	–1,408	–797	–1,615	–1,404
% Reduction	–43%	–21%	–48%	–34%

SOURCES: BUREAU OF JUSTICE STATISTICS, PRISONERS SERIES AND UCR CRIME IN THE UNITED STATES SERIES

California has had the largest numeric drop in its prison population. By 2017 it had lowered its prison population by about 45,000. As of July 2019, its prison population had dropped below 125,000 and its probation, parole, and jail populations had also declined. In total, there were 225,000 fewer people in California's prison, jail, probation, and parole populations than in 2006, when a series of reforms took place. Maryland has had more modest declines in its prison population.

Despite these declines, even larger decreases have occurred in each state's crime rate, with New Jersey and New York showing decreases of over 40%. It is fair to say that no prior research on crime rates would have forecasted substantial declines in crime rates if imprisonment rates were sharply lowered.

Any valid assessment of the impact of imprisonment on crime rates must contend with two methodological challenges. The first is the reciprocal relationship between imprisonment and crime rates. Just as imprisonment may reduce crime rates by incapacitating offenders, deterring crime, providing rehabilitative programs to offenders, or all three, increases in the amount of crime can increase the level of imprisonment. All else equal, the higher the crime rate, the higher the imprisonment rate. As we show later, this is true with respect to state violent crime rates. States with higher violent crime rates tend to have higher imprisonment rates.

Some studies have addressed this challenge by analyzing the relationship between the imprisonment rate and crime rate with an "instrument"—a varying factor that affects imprisonment but has no direct effect on crime (e.g., Levitt 1996). Instead, we follow most previous research by lagging the imprisonment rate behind the crime rate in our models, on the assumption that current crime rates cannot affect past imprisonment rates (but that the previous year's imprisonment rate can affect the next year's crime rate). Nonetheless, we cannot claim with certainty that we have correctly identified the causal effect of imprisonment on crime.

The second and larger methodological challenge involves disentangling the effect of imprisonment on crime from the effects of other, numerically larger components of the correctional system—probation, local jails, and parole—which, as we have mentioned, also incapacitate, deter, and rehabilitate those arrested for crimes. None of the earlier studies has tried to assess the independent and joint effects of the entire correctional system on crime rates. Instead, prior research has focused only on imprisonment rates. We acknowledge that our study shares the same limitation.

As shown in Table 4, the prison population, as measured by annual admissions and the standing population, represents a small share of the total correctional system. The largest component in terms of yearly admissions is the jail system, which has over 10 million admissions, as compared to the approximately 680,000 prison admissions. Probation is the next largest system in admissions and also the largest standing population, with over 3.7 million people under supervision in the community at any given time. These statistics contain multiple-admission events by the same person, but even with that caveat the jail and probation systems are by far the dominant forms of correctional control.

TABLE 4. THE SIZE AND FLOW OF THE U.S. ADULT CORRECTIONAL SYSTEM, 2016

Correctional System Component	Annual Admissions	Population
Jails	10,600,000	727,400
Probation	2,012,200	3,789,800
Parole	457,100	870,500
Prison	678,059	1,526,600
Total	13,747,359	6,914,300
State and Federal Prison Share	5%	23%

SOURCE: BUREAU OF JUSTICE STATISTICS

We also know that all four systems have grown at roughly the same rate. Figure 5 displays the trends in the imprisonment, probation, parole, and jail population rates between 1980 and 2016. The imprisonment rate grew by 265% between 1980 and its peak of 529 prisoners per 100,000 population in 2007 and declined to a rate of 466 per 100,000 by 2016. The three other correctional populations have exhibited the same pattern of sustained growth to a peak in 2007 and modest decreases thereafter. Because they are all growing and moderating roughly in unison, one cannot tease apart the separate effects on crime rates of these common growth patterns in the four correctional populations.

FIGURE 5. GROWTH IN CORRECTIONAL POPULATIONS, 1980–2016

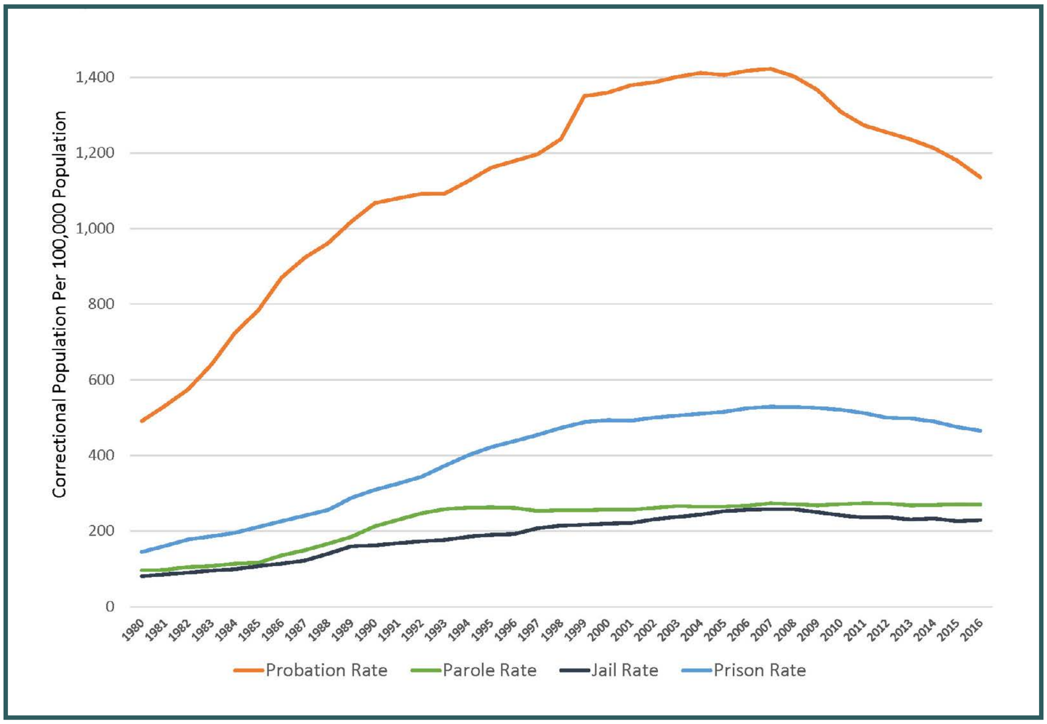


Table 5 displays the correlations among the average prison, probation, parole, jail, and total correctional population per 100,000 U.S. population between 1980 and 2016. As the table shows, all four components of the correctional system are highly correlated. So it was not the case that as the prison population rose between 1980 and the mid-2000s, local jail and probation populations declined as people were being diverted to prison. Rather, all forms of correctional control rose sharply.

TABLE 5. CORRELATIONS AMONG CORRECTIONAL CONTROL POPULATIONS, 1980 - 2016

Correctional Component	Prison	Probation	Parole	Jail
Probation	.959			
Parole	.952	.930		
Jail	.990	.961	.947	
Total Corrections	.986	.991	.960	.985

NOTE: TOTAL CORRECTIONS IS THE SUM OF THE AVERAGE ANNUAL PRISON, PROBATION, PAROLE, AND JAIL POPULATIONS.

This also means that when these four measures are included in a regression model, because they are so highly correlated with one another, it is nearly impossible to statistically disentangle the effect of the imprisonment rate from the effects of the three other correctional variables.

Was it the rise in the prison population or the much larger number of people being booked and held in local jail systems or being sentenced to probation that most influenced crime rates? There is certainly a possibility that the other forms of correctional control have had a greater impact than imprisonment has, particularly the jail and probation systems, which make up 90% of the total admissions to the correctional system and represent two-thirds of the total correctional population. These statistics should prompt policymakers and criminologists to question previous conclusions regarding the effects of imprisonment rates alone on crime.

Estimating the Effects of Lowering Prison Populations

How were several states able to substantially reduce their prison population without increasing their crime rates? Our statistical models of crime rates, shown earlier, offer some insight. Two critical modeling conditions must be met to gauge reliably the effect of prison reductions on crime: (1) the model must predict crime rates with a high degree of accuracy, and (2) it must include factors, in addition to imprisonment, that are related to crime rates. Achieving the first condition depends on meeting the second requirement, because, as we have shown, crime rates are a product of many factors, including demographic and socioeconomic conditions over which criminal justice policymakers have little direct influence. The models we have presented here, particularly the first one, meet both conditions.

We can now use the models to estimate the change in crime rates given hypothetical reductions in the imprisonment rate. We evaluate a scenario of a 25% decrease in the total imprisonment rate, as that is the reduction being achieved by several states to date.

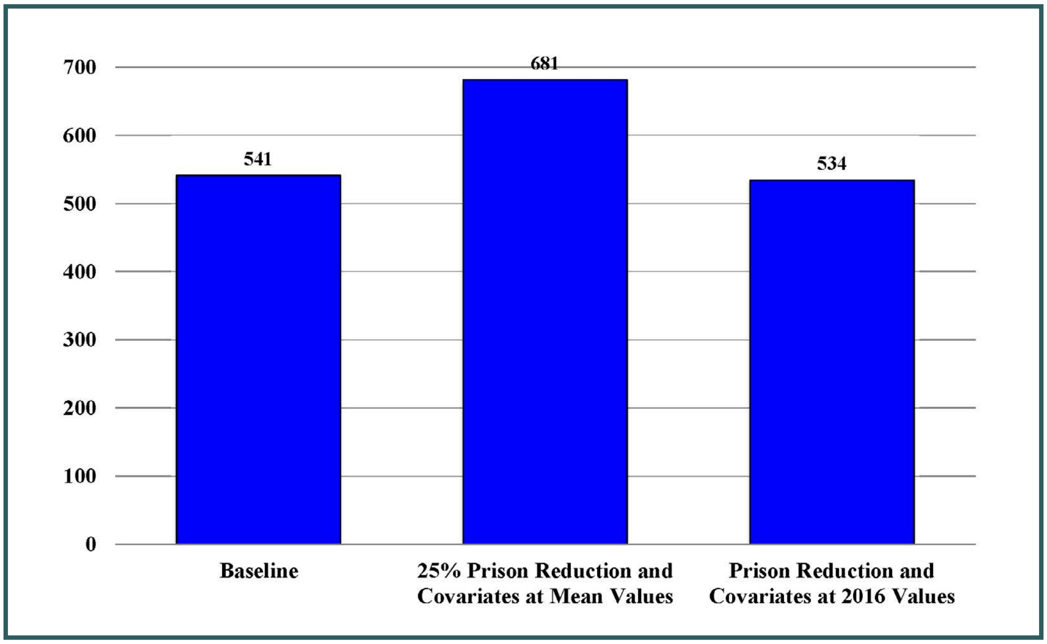
Imprisonment Reductions and Violent Crime

The average annual UCR violent crime rate between 1980 and 2016 was 541 violent crimes per 100,000 population. A person's chance of being victimized was thus 1-in-185 per year. Based on the violent crime model shown in Table 1, if the average imprisonment rate had been 25% lower and the other factors affecting crime rates were at their averages for the period, the average violent crime rate would have been 681 crimes per 100,000 population rather than 541 (Figure 6). This increase of 30% would raise individual risk to 1-in-156.

But, again, this estimated increase is valid only if all of the non-criminal-justice factors affecting the violent crime rate discussed earlier remained at their average values. That is not what happened during this period. For example, by 2016 the teen birth rate had fallen by more than half from its value in 1980, from 45.6 births per 1,000 women age 15-19 to 20.3 per 1,000. The inflation rate also decreased over the period, from an annual average of 3.3% to 1.3%. The divorce rate rose over the period from 9.3% to 11%. As shown in Figure 6, if these conditions were set to their

2016 values and imprisonment were reduced by 25%, the violent crime rate would actually fall, to an estimated 534 violent crimes per 100,000.[5]

FIGURE 6. ESTIMATED VIOLENT CRIME RATE GIVEN 25% REDUCTION IN IMPRISONMENT RATE



Imprisonment Reductions and Property Crime

The average property crime rate between 1980 and 2016 was 3,992 crimes per 100,000. If the average imprisonment rate had been 25% lower and all other conditions affecting property crime were unchanged, the average property crime rate would have been an estimated 14.3% higher, at 4,563 property crimes per 100,000 (Figure 7).

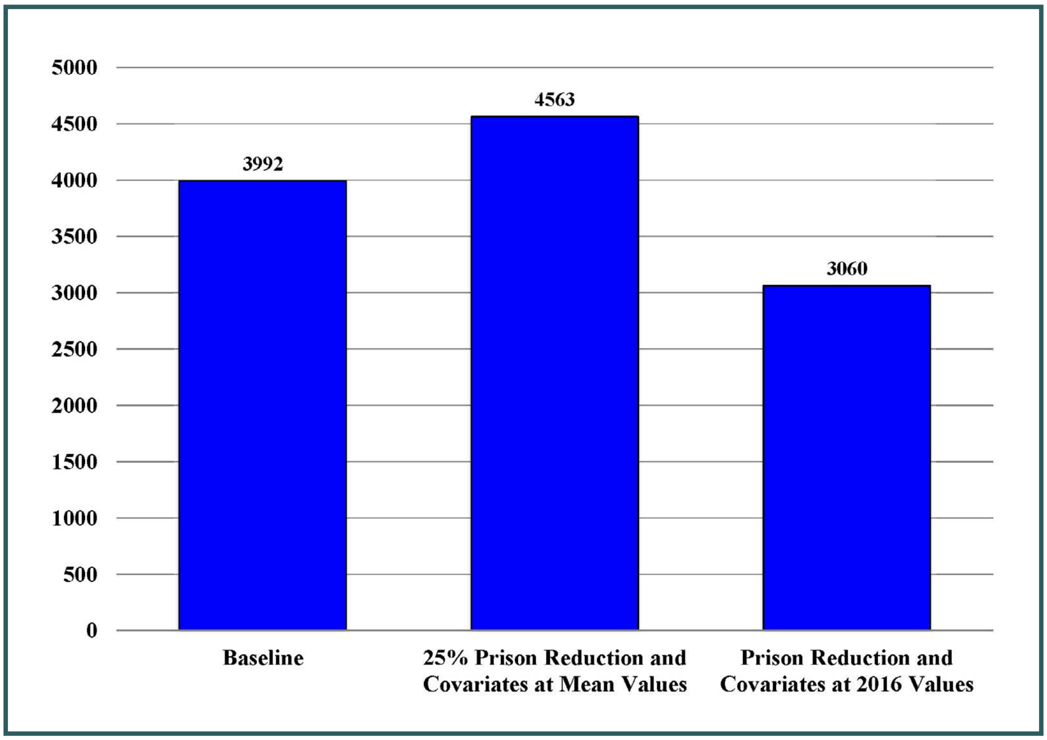
As before, however, these estimates assume no change in the other conditions that affect property crime rates, such as inflation and educational attainment. If those non-criminal-justice conditions are set to their 2016 values,[6] reducing the imprisonment rate by 25% would be associated with an estimated property crime rate of 3,060 per 100,000, a 23.3% reduction from the average rate of 3,992.

5 THE PERCENTAGE OF THE POPULATION BETWEEN 18 AND 24 YEARS OF AGE DRIFTED DOWNWARD DURING EARLY YEARS OF THE OBSERVATION PERIOD, THEN INCREASED FOR A FEW YEARS AND FELL AGAIN DURING THE LAST FEW YEARS OF THE PERIOD. GIVEN THIS TRENDLESS OSCILLATION, WE LEAVE THIS VARIABLE AT ITS MEAN VALUE.

6 THE PERCENTAGE OF THE POPULATION BETWEEN 18 AND 24 IS KEPT AT ITS MEAN VALUE.

These exercises show why some states that lowered their imprisonment by 25% or more none-theless saw their crime rates decline as steeply. Other conditions that influence crime also change over time, and with few exceptions those economic and demographic changes have been exerting downward pressure on crime for nearly the past four decades. The question now is what the future holds. Should we expect crime rates to continue to drop, thereby providing even more opportunity for purposeful reductions in imprisonment?

FIGURE 7. ESTIMATED PROPERTY CRIME RATE GIVEN 25% REDUCTION IN IMPRISONMENT RATE



Projecting Future Crime Rates

Estimating future crime rates must be based on assumptions about whether and how the non-criminal-justice factors in our models will change in the future. Fortunately, many of these factors do not fluctuate widely from year to year. In particular, the demographic and economic sectors change very gradually and offer plenty of time to anticipate potential effects on crime. Even the more volatile correctional population systems rarely change dramatically within a year or two. To be sure, there have been major economic shocks to financial markets and the general economy. A recent example is the 2008-09 Great Recession. However, crime rates did not increase as a result of the recession and actually continued to decline, largely due to the continuing effects of lower inflation (Rosenfeld and Levin 2016).

In this section we present two approaches, both quantitative models, for estimating future crime rates. The first employs the regression analysis discussed above and uses a small number of predictive variables. The second, though less rigorous, includes a larger array of predictors. Both support our findings that future crime rates will be driven largely by non-criminal-justice factors.[7]

Model A

Model A, which utilizes the statistical model presented earlier, allows us to vary assumptions about future changes in factors that have driven past changes in crime rates, asking, for example, what would happen if inflation remained at its current level or rose or fell by two or three percentage points. In this exercise, we project violent and property crime rates to 2021, five years beyond the endpoint of our analysis of past crime rates. We know the UCR violent and property crime rates for 2017 and can use them as a partial test of the near-term accuracy of the projections.

Recall that the annual violent crime rate between 1980 and 2016 is associated with the imprisonment, inflation, teen birth, and divorce rates and with the percentage of the population between 18 and 24 years of age. The annual property crime rate during the same period is associated with the imprisonment and inflation rates, percentage of the population with a four-year college or higher degree, proportion of the labor force employed in manufacturing, and the proportion of the population between 18 and 24.

7 AT THE TIME OF WRITING (2019), FBI UCR CRIME RATES ARE NOT AVAILABLE FOR 2018 OR 2019.

We start with a five-year projection for violent and property crime assuming that these explanatory factors will continue to trend over the next several years in the same direction and at roughly the same rates as during the previous five years. The value of each of these variables in 2017 is known. Our assumptions about subsequent values through 2021 are presented in Table 6.

In addition to projecting the violent and property crime rate assuming the trends shown in Table 6, we developed projections informed by "best-case" and "worst-case" scenarios of possible values of these factors. In the best-case scenario, we assumed that the imprisonment rate would remain at its 2017 value through 2021; the inflation rate would remain at its (actual) 2018 value; the teen birth and divorce rates would fall to values of 15.4 and 10.5, respectively, in 2018 and remain there until 2021; the percentage of the population with a bachelor's or higher degree would rise to 34.8% in 2018 and remain there; and the fraction of the labor force in manufacturing would remain at its 2017 value throughout the projection period.

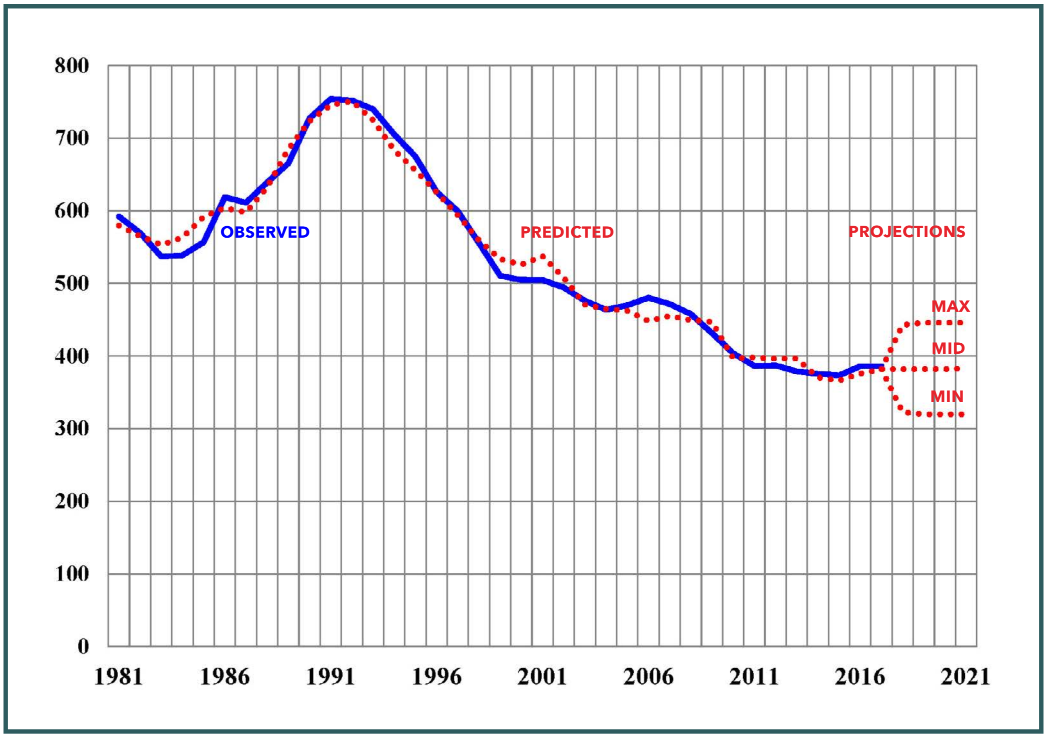
TABLE 6. OBSERVED AND ASSUMED VALUES OF FACTORS AFFECTING VIOLENT AND PROPERTY CRIME, 2017-2021

Factor	2017	2018	2019	2020	2021
State/Fed Imprisonment Rate	440	430	420	410	400
Inflation Rate	2.1	2.4	2.6	2.8	3
Teen Birth Rate	18.8	17.9	17.0	16.2	15.4
Divorce Rate	10.9	10.8	10.7	10.6	10.5
% of Population 18-24	9.5%	9.5%	9.5%	9.5%	9.5%
% with Bachelor's or Higher Degree	32.0%	32.7%	33.4%	34.1%	34.8%
Proportion in Manufacturing	10.0%	9.5%	9.0%	8.5%	8.0%

NOTE: 2017 DATA FOR ALL VARIABLES ARE KNOWN VALUES; 2018 INFLATION FIGURE IS THE KNOWN VALUE.

In the worst case, inflation would jump to 3% in 2019 and stay there until 2021; teen birth, divorce, and percentage with a bachelor's or higher degree would remain at their 2017 values through 2021; the proportion of the labor force in manufacturing would drop from 10% to 8% and remain there; and imprisonment would fall to a rate of 400 in 2018 and remain there. In both the best- and worst-case scenarios, we keep the percentage of the population between 18 and 24 at 9.5%, its 2017 value. These numeric choices yield the lower and upper limits of our violent and property crime projections, shown in Figures 8 and 9.

FIGURE 8. PROJECTED VIOLENT CRIME RATE, 2017–2021



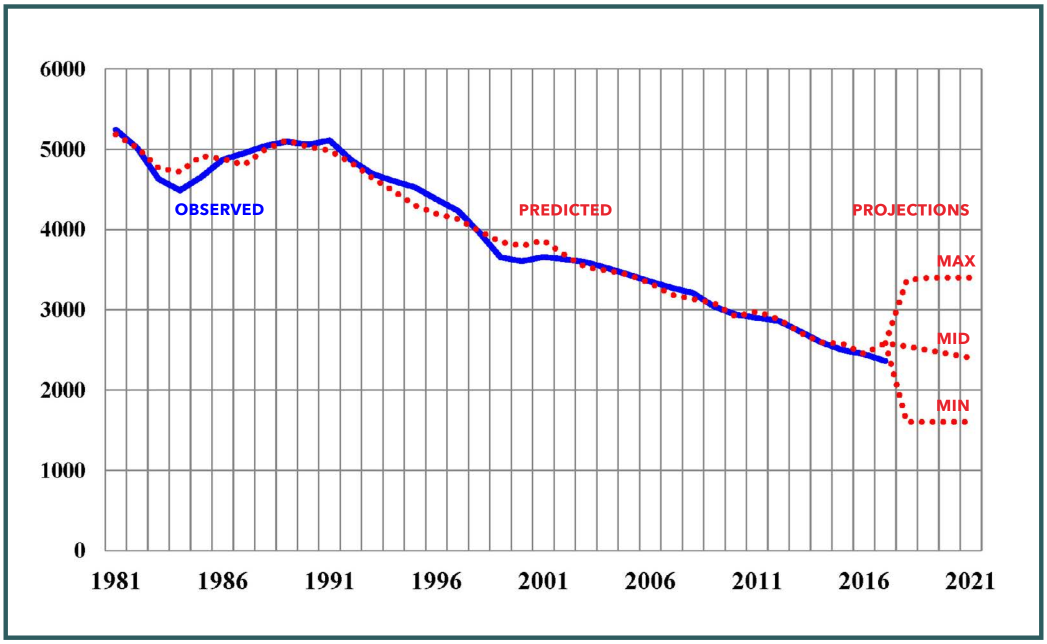
The violent crime rate projection for 2017, based on the actual values of the explanatory conditions —382 violent crimes per 100,000 population—is nearly identical to the observed 2017 rate of 386. Our best-guess projection of violent crime, shown as the "mid" projection in Figure 8, is that it remains flat through 2021.

The worst-case ("max") projection of violent crime increases to a rate of 443 per 100,000 in 2018 and 446 in 2019, where it remains through 2021. The best-case ("min") projection of the violent crime rate is a drop to 320 per 100,000 population in 2018, where it remains through 2021. The range between the worst- and best-case projections for 2021 is 126 violent crimes per 100,000 population. If the best-case projection came true, violent crime in 2021 would be lower than at any time since 1968. If the worst-case projection turned out to be correct, violent crime in 2021 would return to its level in 2008.

The baseline projection for property crime in 2017, using actual 2017 values of the predictive factors, is 2,585 property crimes per 100,000 population, which is 9.4% higher than the observed 2017 rate of 2,362. After that, however, the baseline projection resumes the downward trend in property crime that has prevailed since the early 1990s. In the worst-case scenario, the property crime rate would rise to 3,367 in 2018 and to 3,402 in 2019, where it would remain through 2021.

In the best case, the property crime rate would drop to 1,604 in 2018 and stay there through the end of the period. The worst-case property crime projection is more than twice as large as the best-case, a range that is considerably wider than that for violent crime. If the best-case property crime projection for 2021 turned out to be correct, the rate would have descended to a level not seen since 1960. Under the worst-case scenario, 2021 property crime would be at the rate last seen in 2005.

FIGURE 9. PROJECTED PROPERTY CRIME RATE, 2017-2021



We emphasize that these projections are based on, and limited to, the explanatory conditions in our models of crime rates covering the 1980-2016 period. We expect those conditions to trend over the next five years as they have during the previous five. We acknowledge that this expectation could be incorrect, which is why we have also provided upper and lower limits to our best-guess projections. Even then, however, we have restricted our worst- and best-case scenarios to the expected values of the explanatory conditions during the next five years and simply altered the timing of the expected changes. This procedure would turn out to have been ill-chosen if the inflation, teen birth, or divorce rates or any of our other explanatory factors moved higher or lower than the values we have chosen. It is also possibile that substantial changes in factors not considered in our models—"exogenous shocks"—could drive crime rates above or below our projections (Rosenfeld 2018).

Online tools based upon this model (hfg.org/national_forecaster.htm) and a similar model for the state of Illinois (hfg.org/illinois_forecaster.htm) allow users to observe the effect of changing these predictor variables on violent and property crime rates.

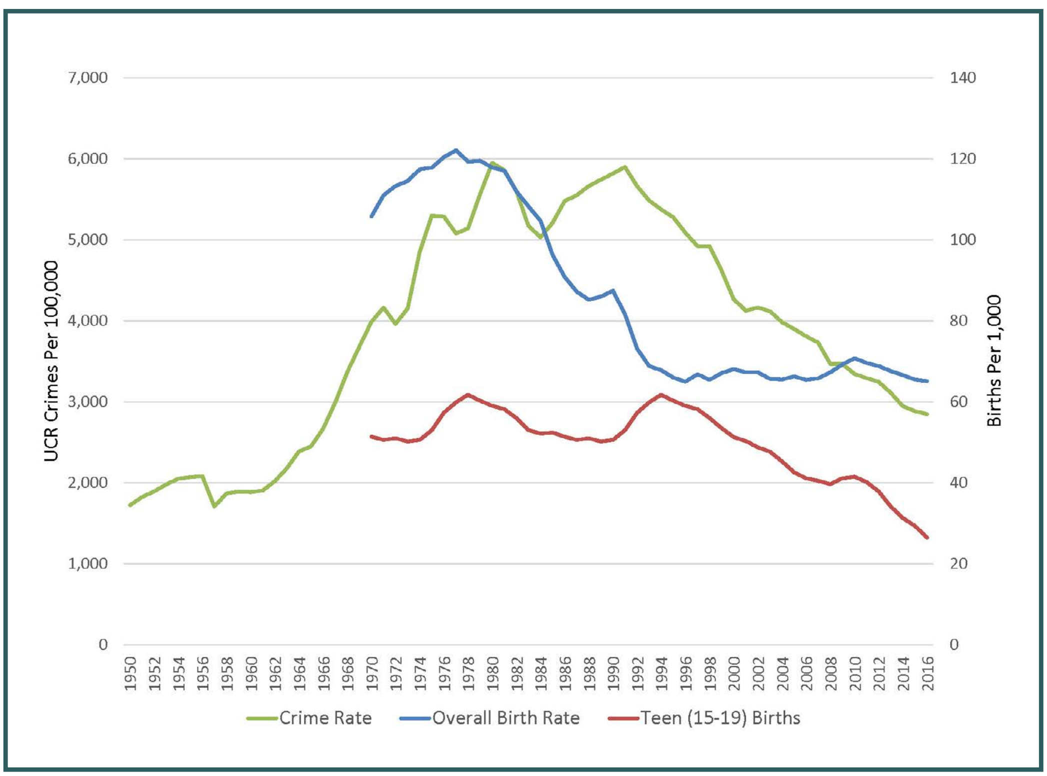
Model B

Model B projects crime trends using the following wider array of economic and demographic factors that research has shown to be correlated with changes in crime rates.

Demographic Sector

In addition to using a slightly more comprehensive lower-age group—15-24—we have added the 55-and-older group and projected fertility rates. As shown in Figure 10, trends in the overall birth rate and teenage birth rate are both correlated with the crime rate. Collectively, the demographic sector will continue to exert a suppressing effect on crime rates. The U.S. population will continue to age and women will continue to have low birth rates, a projection based on, among other studies, a recent analysis by Munnell, Chen, and Sanzenbacher (2018), which projects that the drop in fertility will continue at its current rate as long as the social and cultural factors driving it (e.g., increasing educational attainment and lower religious affiliation for women) persist. Similarly, teen birth rates are now at the lowest level since first recorded.

FIGURE 10. LAGGED BIRTH, TEENAGE BIRTH, AND UCR CRIME RATES, 1950–2017



Household Sector

The household sector consists of the size of U.S. households and the percent of households with children under age 18. This indicator is related to the decline in overall fertility and to teen births. Since 1970 the average size of the U.S. household has declined from 3.35 to 2.53 members and the percentage of female-headed households had dropped from a peak of 18% in 1980 to 8% by 2016. Perhaps the reduction in household size is correlated with declining crime because, with fewer children in the home, parents can provide their children with greater guidance and control.

Economic Sector

In this sector, we have augmented the inflation rate factor of Model A by adding long-term interest rates and % in poverty, both of which are historically correlated with crime rates. Despite considerable historic fluctuations, it does appear that for the future both will remain at or just below their current levels.

Criminal Justice Sector

In the criminal justice sector we include only two factors: the total correctional population and the juvenile arrest rate. As mentioned earlier, it is very difficult to tease out the independent effects of state and federal imprisonment from the other three larger correctional populations (jail, probation, and parole). There is currently some state and federal legislative and administrative activity to further reduce the size of the four correctional populations, which could serve to lower the rate of the projected decline in crime rates. But the larger influence of the demographic, household, and economic sectors should negate any crime-increasing influence of reductions in the correctional population.

We include juvenile arrests in this sector. While not a direct measure of adult imprisonment, age at first arrest is one of the best predictors of subsequent criminal conduct and arrests as an adult (Piquero, Hawkins, and Kazemian 2012). The drop in the number of juveniles arrested each year to about 1 million from a peak of about 3 million bodes well for future crime rates (Figure 11).

Numeric values were applied to each sector and to the individual sub-factors within each to produce an expected direction and magnitude of change in crime rates. For each factor we assigned a score as below (see Table 7):

> +1 indicates the factor will exert upward pressure on the crime rate;

0 indicates the factor will have no impact on crime; and,

-1 indicates the factor will tend to reduce crime.

The values assigned are based on the historical influence of each sector on crime rates between 1950 and 2017. The overall score is -3, which suggests that in the aggregate these factors will exert downward pressure on crime. Unlike Model A, which employs a regression analysis, this approach is less precise in estimating the magnitude of the decline and does not make separate estimates for the violent and property crime rates. But it should be noted that with 11 factors, the overall score could range from -11 to +11. A score of -3 suggests a continuing but moderate decline in crime rates.

TABLE 7. PROJECTED DIRECTION OF CRIME RATE FACTORS

Sector	Projected Direction	Weight	Sector Score
Demographic Sector	Lower		–2
1. % of Population 15-24	Lower	–1	
2. % of Population 55+	Higher	–1	
3. Fertility Rate	Unchanged	0	
4. Teen Birth Rate	Unchanged	0	
Household Sector	Unchanged		0
5. Households with Children Under 18	Unchanged	0	
6. Total Household Size	Unchanged	0	
Economic Sector	Unchanged		0
7. Inflation Rate	Unchanged	0	
8. Long-Term Interest Rate	Unchanged	0	
9. % in Poverty	Unchanged	0	
Criminal Justice Sector	Lower		–1
10. Corrections Population (Prison, Jails, Probation, and Parole)	Unchanged	0	
9. Juvenile Arrests	Lower	–1	
Overall Sector Direction			–3

FIGURE 11. U.S. JUVENILE ARRESTS, 1980–2015

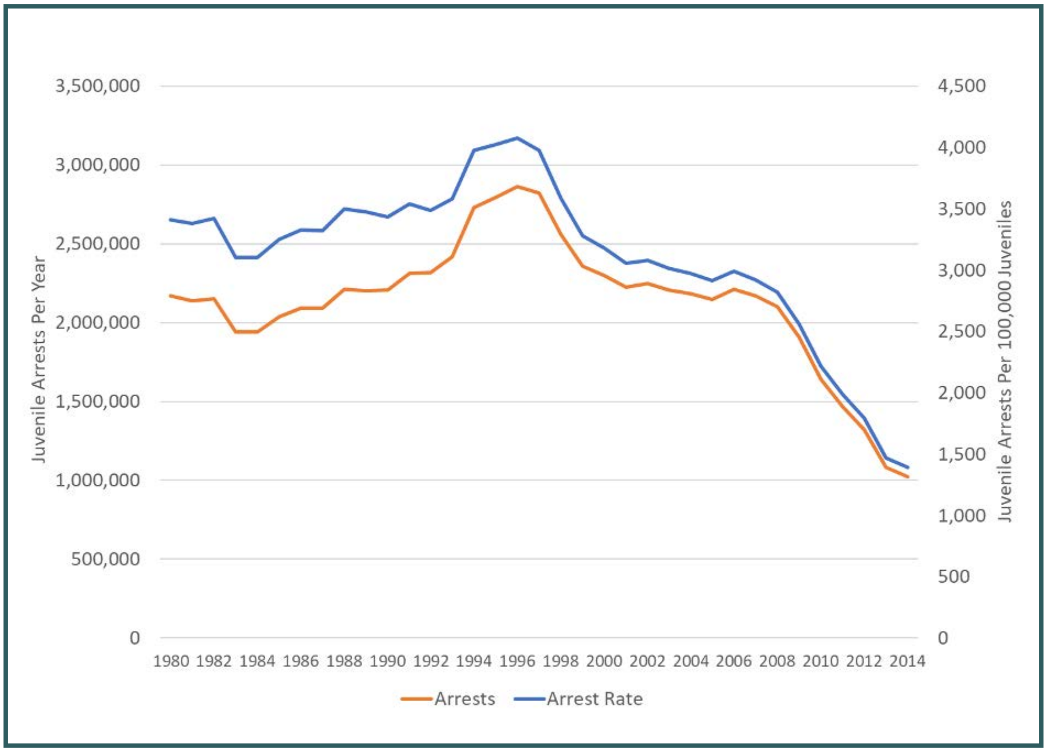
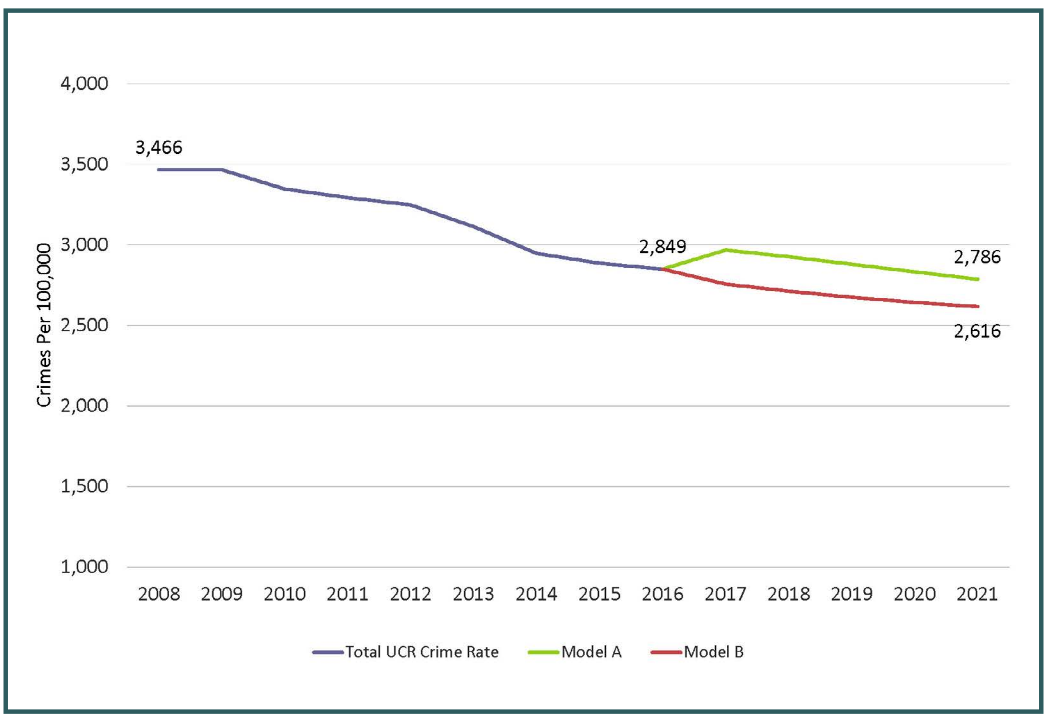


FIGURE 12. ACTUAL AND PROJECTED UCR CRIME RATES, 2008–2021: MODELS A AND B



The rate of decline in the combined UCR property and violent crime rate has been in the 2% per year range. In Figure 11 we show the results for our two models, using the combined crime rate.[8] Both suggest that crime will continue to decline moderately at a rate similar to the past five years, leveling out at about 2,443 crimes per 100,000 population by 2027.

8 THE PROJECTED TOTAL CRIME RATE IN BOTH MODELS IS THE SUM OF THE PROJECTED VIOLENT AND PROPERTY CRIME RATES.

Implications for Safely Reducing Imprisonment and Other Forms of Correctional Control

Current efforts at both the state and federal level to reduce the number of persons serving time in the nation's prisons continue to confront concerns and uncertainties about whether significant decreases in imprisonment will endanger the public. Our analyses and the experience of several states suggest that crime and imprisonment can be simultaneously and significantly lowered. The guiding assumption of our analysis is that the net effect of prison reduction on public safety depends on other conditions, such as the state of the economy and demographic trends, that together have a more powerful impact on crime rates than imprisonment. Policymakers must gauge the consequences of lowering the prison population in concert with realistic assumptions about trends in the other factors that raise or lower crime rates.

Determinants of prison population size

As noted earlier, several states have accomplished significant reductions in both incarceration and crime rates, so we know it is feasible. The question for policymakers in other states who want to achieve similar reductions in imprisonment is how best to do so without jeopardizing public safety.

TABLE 8. STATE PRISON ADMISSIONS, LENGTH OF STAY, AND STATE PRISON POPULATION, 1990 AND 2016

	1990	2016	% Change
Prison Admissions	474,128	610,561	29%
New Commitments	323,069	419,028	30%
Parole Violators	133,870	173,468	30%
Other Admissions	17,189	18,065	5%
Average LOS in Months	18 months	26 months	44%
Prisoners	798,393	1,316,205	65%

SOURCE: BJS CORRECTIONAL STATISTICAL ANALYSIS TOOL (CSAT) ACCESSED AT HTTPS://WWW.BJS.GOV/INDEX.CFM?TY=NPS[P-

The “iron law” of prison populations is that they are produced by the following simple equation:

ANNUAL PRISON ADMISSIONS X LENGTH OF STAY IN YEARS (LOS) = AVERAGE DAILY PRISON POPULATION

The numbers that have produced recent national state prison populations are shown in Table 8. Comparing 2016 with 1990, one can see that while there has been a large increase in the number of prison admissions (29%), the strongest impact has been in the average length of stay (LOS), which has jumped from 18 months to 26 months. This increase was due to such legislative and policy changes as mandatory minimum prison terms, “truth in sentencing,” restrictions in good-time policies, and reductions in parole-grant rates. To lower the prison population, one would have to reverse the policies that have produced these increases.

Several studies have shown that there is no relationship between LOS and recidivism risk (Rhodes et al., 2018): Whether a person serves 12, 18, 24, 30, or 36 months in prison, their expected level of reoffending will be the same. The growth in LOS, as shown in Table 8, has had a huge impact on the prison population. One immediate option for states interested in prison reduction would be to reduce the LOS to the levels that existed in 1990. For each one month reduction in the LOS, the nation’s prison population would decline by about 50,000 inmates. Other reforms would focus on diverting probation and parole technical violators away from prison, restricting the use of prison for certain non-violent crimes, and shortening probation and parole terms.[9] Collectively, these reforms would produce an estimated 50% reduction in the entire correctional population (Austin 2010).

How to accomplish this without jeopardizing public safety would depend on the sentencing structure of the state. Those with indeterminate sentencing could begin to increase parole grant rates. With proper risk assessment instruments and incentives for prisoners to comply with prison rules and case plans, prisoners not assessed as high risk would have a presumptive release at the initial parole hearing. Average LOS would be reduced and the prison population would decline with little or no impact on the state crime rate. Such a system has been deployed by Maryland with exactly these results.

For states with a determinate sentencing structure, similar policies could be implemented. Prisoners who comply with prison regulations and participate in meaningful work and program assignments would receive credits that would move up their release dates. Maryland, which is an

9 TECHNICAL VIOLATIONS ARE VIOLATIONS OF THE CONDITIONS OF PAROLE, SUCH AS CURFEWS OR ABSTINENCE FROM DRUG USE, RATHER THAN NEW CRIMINAL OFFENSES.

indeterminate sentencing state, has successfully applied this incentive-based system, which can easily be applied in states with a determinate sentencing structure. And, regardless of sentencing system, the manner in which populations are reduced can be designed to minimize the potentially negative influence of imprisonment reductions, such as by prioritizing older inmates for release.

Of course, the policy projection models we have presented are not without limitations. We cannot be certain that the estimated imprisonment effects are independent of those of other components of the correctional system. The estimates may be biased to an unknown degree if reverse causality—the effect of crime on imprisonment—has not been fully accounted for.

The Need for State-Level Models

Perhaps the major limitation of the crime rate projections provided here is that they are based on national-level statistical models, which treat the total prison population of the United States as the relevant policy unit for understanding the impact of imprisonment policy on crime. But most criminal justice policy in the U.S. is not promulgated nationally; rather, states and localities are the operational units for crime policy. Local (county and municipal) governments enact and implement the policies that determine the number of people in jails and in many places the number of people on probation. About 90% of the prison population is produced by state-level prison policy. While our national-level analyses are useful for illustrative purposes, policy-relevant crime projections would, ideally, be based on data available at the state and even county levels.

Data from the UCR, our centralized repository of crimes reported to law enforcement agencies, are available for states, counties, and cities. (The NCVS data are not currently available for these geographic units.) Imprisonment data are available for U.S. states and counties. Inflation data are not available for states or counties but are available for selected metropolitan areas and for census regions. The data for the other variables in our models are from census sources covering states, counties, cities, and minor civil divisions.

Corrections policies and populations differ widely across the U.S. states. The imprisonment rate in Louisiana, for example, at 719 per 100,000 residents, is more than five times higher than the rate for Maine, at 134 per 100,000 (Bronson and Carson 2019). These differences in incarceration rates are connected to differences in underlying crime rates. The correlation between the average state incarceration rate and average crime rate for the period 1978-2017 is .80 for murder and .52 for robbery.

Developing state-specific models of the drivers of crime rates would be a substantial policy contribution. Not only would it help to explain why states' experiences are so different, both in the factors influencing the changes in crime rates and in the impact of those factors, it would also provide individual states with a locally relevant, evidence-based mechanism for thinking about imprisonment policy. States could project trends in crime given current sentencing and corrections policies and then appraise the likely effects of new policies. Most important, state-specific models would ground the national conversation about incarceration policy more realistically, at the level that matters: state criminal justice policy.

Appendix A. Preliminary State-Level Crime and State Imprisonment Analysis

This section provides data on the relationship between each state's imprisonment and crime rates. We do this with the recognition that, for the reasons cited in the main report, one cannot make claims of causation between changes in imprisonment rates and subsequent crime rates without incorporating the demographic and economic factors that are also associated with crime rates.

With these caveats, we analyzed the relationship between each state's change in murder and robbery rates and its changes in imprisonment rates between 1978 and 2016. The analysis is limited to these two crimes, as they are considered to be the violent crimes most accurately recorded over time.

Table A1 displays the state-specific results of a random-coefficient bivariate panel model of the impact of a 1% increase in imprisonment in one year on robbery and homicide the next year in each state. For all states combined, an annual 1% increase in the imprisonment rate is associated with a .39% decrease in the murder rate and a .23% decrease in the robbery rate. But there is considerable variation among the states; the impact varies from strongly negative to moderately positive. For example, for robbery, 11 states have positive associations between imprisonment and crime: as imprisonment increases, so does crime. And many of the relationships are statistically non-significant.

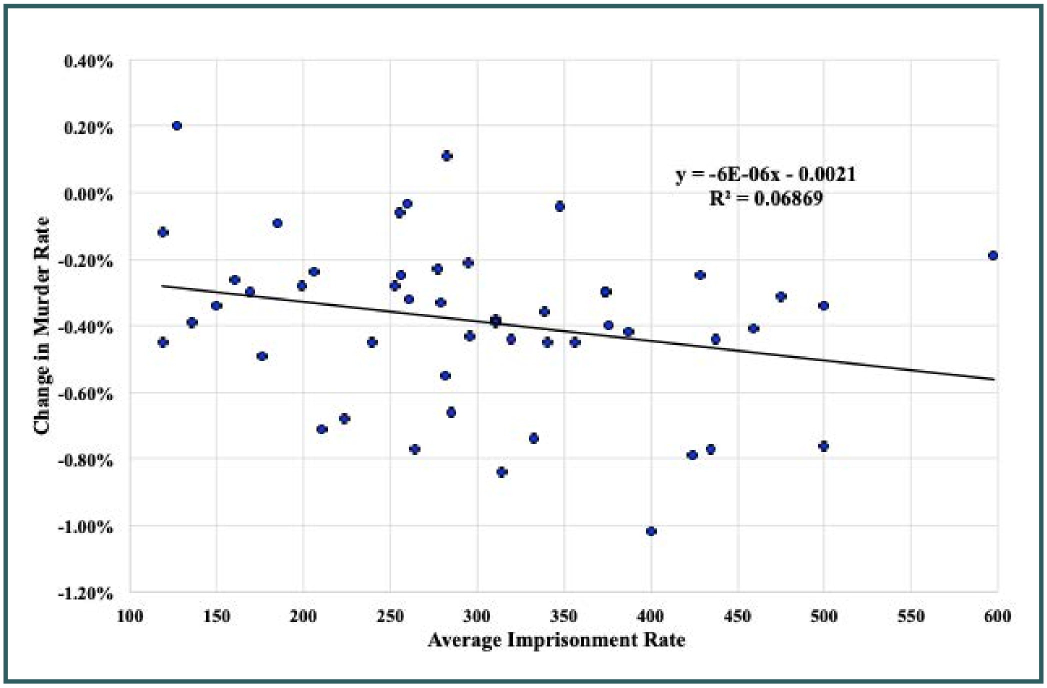
Do changes in imprisonment rate have a stronger effect on crime in states with higher average imprisonment rates? The answer for homicide (Figure A1) is "not much." The answer for robbery, reflected in the flat line of Figure A2, is clearly no.

By way of example, the average imprisonment rates in Massachusetts and Nevada between 1978 and 2016 are very different: 136 versus 434 prisoners per 100,000 population. Yet the estimated drop in robbery for every 1% increase in the imprisonment rate is exactly the same for both states: a .59% drop. So, Massachusetts gets the same degree of public safety (from imprisonment) as Nevada, even though its average imprisonment rate is just one-third as large.

TABLE A1. PERCENTAGE CHANGE IN STATE MURDER AND ROBBERY RATES FOR EACH ONE PERCENT INCREASE IN IMPRISONMENT RATE, 1978–2016 (RANDOM COEFFICIENTS)

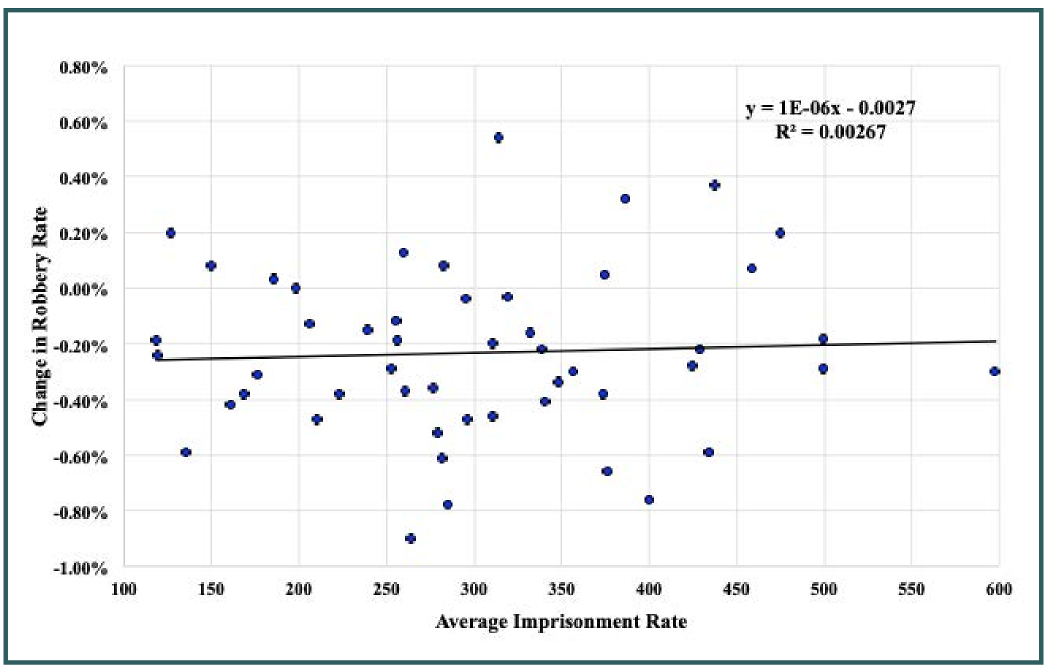
Murder Rate		Robbery Rate	
State	**% Change**	**State**	**% Change**
FLORIDA	–1.02%	OREGON	–.90%
NORTH CAROLINA	–.84%	WYOMING	–.78%
GEORGIA	–.79%	FLORIDA	–.76%
OREGON	–.77%	MICHIGAN	–.66%
NEVADA	–.77%	NEW YORK	–.61%
TEXAS	–.76%	NEVADA	–.59%
ALASKA	–.74%	MASSACHUSETTS	–.59%
WASHINGTON	–.71%	ILLINOIS	–.52%
HAWAII	–.68%	WASHINGTON	–.47%
WYOMING	–.66%	COLORADO	–.47%
NEW YORK	–.55%	IDAHO	–.46%
UTAH	–.49%	RHODE ISLAND	–.42%
VIRGINIA	–.45%	CALIFORNIA	–.41%
NEW MEXICO	–.45%	HAWAII	–.38%
MAINE	–.45%	MISSOURI	–.38%
CALIFORNIA	–.45%	VERMONT	–.38%
SOUTH CAROLINA	–.44%	KANSAS	–.37%
KENTUCKY	–.44%	CONNECTICUT	–.36%
COLORADO	–.43%	MARYLAND	–.34%
DELAWARE	–.42%	UTAH	–.31%
ALABAMA	–.41%	LOUISIANA	–.30%
MICHIGAN	–.40%	VIRGINIA	–.30%
TENNESSEE	–.39%	TEXAS	–.29%
MASSACHUSETTS	–.39%	NEW JERSEY	–.29%
IDAHO	–.38%	GEORGIA	–.28%
OHIO	–.36%	MAINE	–.24%
NEW HAMPSHIRE	–.34%	ARIZONA	–.22%
OKLAHOMA	–.34%	OHIO	–.22%
ILLINOIS	–.33%	TENNESSEE	–.20%
KANSAS	–.32%	MONTANA	–.19%
MISSISSIPPI	–.31%	MINNESOTA	–.19%
ARKANSAS	–.30%	OKLAHOMA	–.18%
MISSOURI	–.30%	ALASKA	–.16%
VERMONT	–.30%	NEW MEXICO	–.15%
NEW JERSEY	–.28%	IOWA	–.13%
WEST VIRGINIA	–.28%	PENNSYLVANIA	–.12%
RHODE ISLAND	–.26%	INDIANA	–.04%
ARIZONA	–.25%	KENTUCKY	–.03%
MONTANA	–.25%	WEST VIRGINIA	.00%
IOWA	–.24%	NEBRASKA	.03%
CONNECTICUT	–.23%	ARKANSAS	.05%
INDIANA	–.21%	ALABAMA	.07%
LOUISIANA	–.19%	SOUTH DAKOTA	.08%
MINNESOTA	–.12%	NEW HAMPSHIRE	.08%
NEBRASKA	–.09%	WISCONSIN	.13%
PENNSYLVANIA	–.06%	MISSISSIPPI	.20%
MARYLAND	–.04%	NORTH DAKOTA	.20%
WISCONSIN	–.03%	DELAWARE	.32%
SOUTH DAKOTA	.11%	SOUTH CAROLINA	.37%

FIGURE A1. AVERAGE IMPRISONMENT RATE (1978–2016) AND CHANGE IN MURDER RATE FOR 1% IMPRISONMENT INCREASE



NOTE: THE FIGURE SHOWS THE PERCENTAGE CHANGE IN THE MURDER RATE ASSOCIATED WITH A ONE PERCENT INCREASE IN THE STATE IMPRISONMENT RATE.

FIGURE A2. AVERAGE IMPRISONMENT RATE (1978–2016) AND CHANGE IN ROBBERY RATE FOR 1% IMPRISONMENT INCREASE



NOTE: THE FIGURE SHOWS THE PERCENTAGE CHANGE IN THE ROBBERY RATE ASSOCIATED WITH A ONE PERCENT INCREASE IN THE STATE IMPRISONMENT RATE.

The story for homicide is a bit different. The effect of changes in the imprisonment rate on the change in the murder rate is somewhat stronger in states with higher imprisonment rates, but the association is not strong ($r= -.26$) and is not quite statistically significant at the .05 level ($p=.07$). A higher imprisonment rate does not guarantee greater public safety from homicide. As an illustration, in both Washington and Texas, the imprisonment effect on the murder rate is relatively strong: a 1% increase in the imprisonment rate is associated with a .71% decrease in the murder rate in Washington and a .76% decrease in Texas. But Washington has an average imprisonment rate that is less than half as large as that of Texas (210 versus 499 prisoners per 100,000 population).

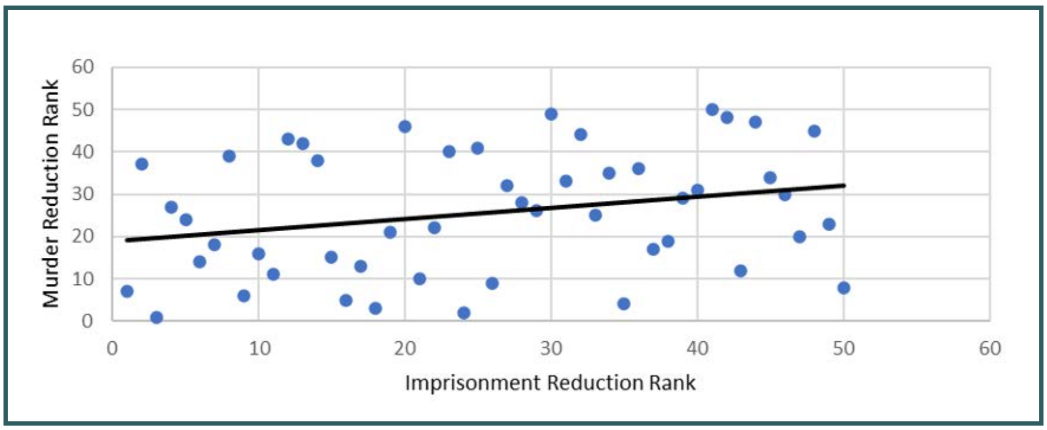
This degree of variation in state-level associations is important because of what it suggests about prior studies of incarceration and crime, almost all of which fail to investigate differences across the states in these associations (for an exception, see Defina and Arvanites 2002). These studies typically find a negative association between imprisonment and crime, often of small but statistically significant magnitude, just as we do. From such findings some commentators have concluded that a good way to reduce crime is to maintain high imprisonment rates (Marvell and Moody 1997; Levitt 1996). This approach would call for state-level policies that maintain high prison populations, since it is state practices that, collectively, produce the large national prison population.

Our data also demonstrate that applying national level results to individual states is an example of the "ecological fallacy"—assuming that the relationship observed at the aggregate level applies to the constituent units. For some states a practice of increasing incarceration rates might be associated with a decline in homicide and robbery, but for others the opposite might be the case. Several studies using local and state-level data have found, as we have for some states (Table A1), that increases in imprisonment have been associated with increases in crime over time (Clear 2007; Kovandzik and Veiraitis 2006; Veiraitis, Kovandzik, and Marvell 2007).

To reiterate, we find that a state's level of imprisonment has little to do with what happens to its rate of murder over time and nothing to do with its rate of robbery. This is further evidence that the aggregate, national impact of imprisonment on crime does not translate into advice that states should maintain higher incarceration rates to suppress crime. States that did so had little or no more success in suppressing crime during the "get-tough" era of the 1980s and 1990s than states that kept imprisonment rates lower.

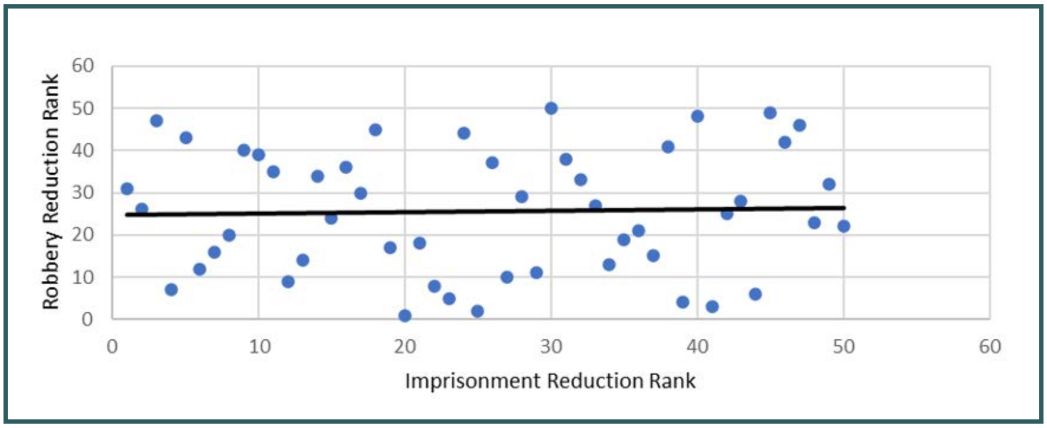
Heterogeneity in state-level incarceration impact is accompanied by substantial variation in recent trends in imprisonment rates, opening the door to a comparative analysis. For the nation as a whole, imprisonment rates peaked in 2007 and have inched downward since, with a total national drop in imprisonment of more than 8% since 2008. But two states (New Jersey and New York) peaked a decade before that time and have experienced total prison population drops in excess of one-third (Ghandnoosh 2018). An additional 10 states peaked before the national peak in 2008, while 8 states are still growing. If the national-level inverse relationship between one year's imprisonment rate and the next year's crime rate applied uniformly at the state level, we would expect states that reduced their imprisonment to have seen increases in crime compared to states that did not.

FIGURE A3. RELATIONSHIP BETWEEN IMPRISONMENT REDUCTION AND MURDER REDUCTION



Figures A3 and A4 show the relationship between each state's ranking in its reduction in imprisonment (the drop from its peak incarceration year to 2016) and the drop in its murder rate (A3) and robbery rate (A4). (A state with a lower number on either axis had a greater change in that dimension. A state in the lower-left quadrant, for example, had a relatively greater drop in both its imprisonment rate and its murder or robbery rate.) For murder, the correlation (Spearman's rho) is a non-significant .26 ($p = .07$); for robbery, rho = .03 ($p = .83$), and is also not significant. In other words, bringing the prison population down more aggressively is not significantly related to changes—up or down—in robbery or murder. That said, for murder there is a small but non-significant positive relationship, suggesting that states that reduced their imprisonment rates more may have had larger drops in their murder rate between 1978 and 2016.

FIGURE A4. RELATIONSHIP BETWEEN IMPRISONMENT REDUCTION AND ROBBERY REDUCTION



To summarize, there is substantial variation among the states in imprisonment rates, crime rates, and the relationship between the two. There appears to be no dominating pattern in the way state incarceration policy has affected crime. The small negative association we find between imprisonment and crime at the national level is a consistent property of neither the states nor particular crimes. There is no single policy implication upon which state policy makers can depend. The relevant lessons are to be found in analyses of each state. The simple bivariate results shown here offer a promising foundation for future multivariate research on the state-level impact of all of the factors discussed in this report.

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