

13 Topics in the Economics of Crime and Punishment

*We have strict statutes and most biting laws,
The needful bits and curbs to headstrong weeds,
Which for this fourteen years we have let slip; . . .
Now, as fond fathers,
Having bound up the threat'ning twigs of birch, . . .
Not to use, in time the rod more mocked becomes than feared:
so our decrees, . . . to themselves are dead;
And, liberty plucks justice by the nose,
The baby beats the nurse, and quite athwart
Goes all decorum.*

SHAKESPEARE,
Measure for Measure, ACT I, SCENE 3

LIKE SHAKESPEARE in the preceding quote, American voters from 1980 to 2000 apparently thought that state authorities were too soft on crime—they “let slip” the “needful bits and curbs to headstrong weeds.” Legislators responded to the cry of voters for harsher treatment of criminals by enacting “strict statutes and most biting laws.” What was the result? In this chapter we review the statistical evidence on crime and punishment, and we try to determine whether people responded to harsher punishments as predicted by the economic theory of crime developed in the preceding chapter. We also summarize the economic literature on the death penalty, examine the connection between crime and drug addiction, and discuss the economics of handgun control.

I. Crime and Punishment in the United States

A. Crime Rates

Trends in the rate of crime (the amount of crime divided by population) in recent decades in the United States can be summarized as follows:

1. From a peak in the mid-1930s, the rate of most crimes (both violent and nonviolent) decreased to a low point in the early 1960s.
2. Between the early 1960s and the mid- to late 1970s, a rapid and unprecedented increase in the rate of all crimes occurred.

3. Between the early 1980s and the early 1990s, the rate of most nonviolent crime among adults decreased markedly; the rate of violent crime decreased slightly among adults and increased among youth.
4. From the early 1990s to at least 2008, both violent and nonviolent crime continued to decline, but at a much slower rate than the declines of the 1990s.¹

How do these rates compare with those of other countries? With respect to nonviolent crimes, the recent rates in the United States are roughly the same as those in other developed nations. More accurately, the recent trends in nonviolent-crime rates in other countries have been upward, while those in the United States have been declining, with the result that nonviolent-crime rates in the United States are now roughly equivalent to or even below those in other developed countries. Consider, for example, that in the early 1980s the burglary rate in Great Britain was significantly lower than the U.S. rate, but that by the early 2000s the Great Britain burglary rate was higher than the U.S. rate. Similarly, the automobile-theft rate in France in the early 1980s was lower than that in the United States; by the early 2000s the rate in France was greater than that in the United States. Finally, as early as 1984 the burglary rate in the Netherlands was almost twice that in the United States and has remained so.

Although the United States resembles Europe in rates of nonviolent crime, it differs significantly in rates of violent crimes. The United States has been the leader of the industrialized world in homicide rates (homicides divided by population) as long as records have been kept. For well over 100 years, large U.S. cities have had significantly higher homicide rates than similarly sized European cities. Nonetheless, the surge in U.S. homicides and other violent crimes beginning in the 1960s was unlike anything that has ever occurred in Europe. Even though homicide rates have always been higher in the United States than in Europe, homicide and other violent-crime rates in the United States have generally been falling recently. In fact, in 1991 there were approximately 24,700 homicides in the United States and about 16,600 in 2004, a drop of more than one-third.² The FBI estimated that there were 16,272 homicides in 2008. The already-low homicide rates in Europe have fallen in the last 10 years (with the curious exception of England, where they have risen), but they have not fallen as rapidly as have U.S. rates.

B. Imprisonment Rates

Legislators responded to the increase in crime by increasing the severity of punishment, especially imprisonment. The total number of prisoners in all jails and prison has risen sharply in the United States in recent years. In 1970, the incarceration rate in the United States was below one person in 400. Subsequently it quadrupled. In 2008,

¹ The principal sources for statistical information on crime are the U.S. Federal Bureau of Investigation's *Uniform Crime Reports* (annual) and the U.S. Department of Justice, Bureau of Justice Statistics, *Sourcebook of Criminal Justice Statistics* (annual).

² Violent crimes (murder, rape, robbery, and aggravated assault) increased by a small amount (2.5 percent) in 2005 after small declines in 2002–2004. Murder declined 2.4 percent in 2004 but was up 4.8 percent in 2005; the murder rate has been roughly constant from 2005 through 2008.

roughly one in every 100 adults was incarcerated, and roughly two in every 100 were on probation or parole.³ As a proportion of the total population, the U.S. incarceration rate is five times the rate in Britain, nine times that in Germany, and 12 times that in Japan. Politicians responded to the public's perception of a crime epidemic with this unprecedented increase in the use of imprisonment in the United States of America.⁴

C. Causes of Crimes

The changes in crime rates prompt a search for possible causes. Here are some statistical facts that stand out.

First, most large cities in the United States have violent-crime rates that are two to seven times higher than those in their suburbs. While this fact suggests that urbanization contributes to crime, changes in urbanization do not align with changes in crime rates; so, the former cannot explain the latter.

Second, a disproportionate amount of criminals are young males. Arrest statistics suggest that two-thirds of all street crime in the United States is committed by persons under age 25, almost all of whom are male. Approximately 93 percent of all U.S. prisoners are male. Changes in crime rates often follow changes in the distribution of people by age. An increase in the proportion of adolescents will increase the rate of crime, all other things held equal. The discernible jump in all crimes in the early 1960s coincided with the maturing into adolescence (roughly ages 14 to 24) of the "baby boom" generation that had been born just after World War II, and the decline in crime in the 1980s coincided with the aging of the population.⁵ The increase in the amount of crime between the 1960s and the 1980s, however, was so large that the increase in the number of 14- to 24-year-olds explains only a fraction of it. For example, one study found that the rise in the murder rate during the 1960s was more than 10 times greater than what one could have predicted from the changing age distribution of the population.⁶

³ By the end of 2008, there were a total of 2,424,279 people confined: 1,518,559 in federal and state prisons; 785,556 in local jails; and 92,845 in juvenile detention facilities. An additional 4.8 million are on probation or parole. For a summary, see Adam Liptak, "1 in 100 U.S. Adults Behind Bars, New Study Says," *New York Times*, February 28, 2008, http://www.nytimes.com/2008/02/28/us/28cnd-prison.html?_r=2.

⁴ Joke: A conservative is a liberal who has been mugged, and a liberal is a conservative who has been arrested.

Remark: In the 1980s, more liberals were being mugged than conservatives were being arrested.

⁵ In 1950 there were 24 million people ages 14 to 24, and by 1960 that figure had increased only marginally to 27 million. However, within the next decade the number increased by 13 million, or by 1.3 million per year. In 1990 there were 1.5 million fewer boys ages 15 to 19 than there had been in 1980. This group accounted for 9.3 percent of the U.S. population in 1980 but for only 7.2 percent of the population in 1990. See Section IID for a theory about the reasons for these changes and a possible connection to the amount of crime.

⁶ A detailed discussion of these figures and of alternative explanations for the crime wave of the 1960s may be found in JAMES Q. WILSON, *THINKING ABOUT CRIME* (rev. ed. 1983), pp. 13–25 (Ch. 1, "Crime Amidst Plenty: The Paradox of the Sixties") and pp. 223–249 (Ch. 12, "Crime and American Culture"). It is also important to note that this secular increase in the amount of crime was observed in *all* of the developed economies, not just in the United States.

Third, violent criminals and their victims in the United States are disproportionately African Americans. To illustrate, homicides are committed against the U.S. non-black population at about the same rate as against the nonminority populations in European countries and, in fact, at *lower* rates than in some European countries. Black victims of homicide elevate U.S. murder rates to the highest among developed countries. One of the most vitriolic policy debates in the United States concerns the connection between violence and race. One side blames discrimination as the cause, and the other side locates the problem in black society. (See the box, “African Americans and Crime.”)

Fourth, a small number of people commit a large proportion of violent crimes. Approximately 6 percent of the young males of a given age commit 50 percent or more of all the serious crimes committed by all young males of that age. This remarkable fact is true in most countries, not just in the United States. The characteristics of this 6 percent of young males are remarkably consistent across different cultures. They tend to come from dysfunctional families, have close relatives (including parents) who are criminals, have low verbal-intelligence quotients, do poorly in school, are alcohol- and drug-abusers, live in poor and chaotic neighborhoods, and begin their misbehavior at a very young age.⁷

This sociological sketch suggests a connection between crime and poverty, which suggests a connection between crime and the economy. For example, an increase in unemployment rates might cause an increase in crime rates. In fact, this connection is weak. During the prosperous 1960s, the U.S. economy grew and the distribution of income became more equal; yet, the United States experienced a rapid increase in the amount of crime. During the economically prosperous 1990s, crime declined dramatically, even though the income distribution became less equal. (We will investigate the causes of this decline shortly.) And in the Great Recession of 2008–2010, the rise in unemployment rates from about 5 percent in 2007 to almost 10 percent in late 2010 has not been associated with higher crime rates. (See our further discussion of these relationships in Section IIB below.)

We have been discussing the social statistics of crime, which we relate to deterrence of crime. The economic theory of the previous chapter suggests that criminals are deterred partly by the severity of the punishment and partly by its certainty. Has this been prediction been borne out by events of the recent past? Perhaps so. The United States responded to increased crimes in the late 1960s and 1970s by longer prison sentences, not by increasing the certainty of punishment. To be concrete, the United States built more jails and hired more guards to punish criminals, rather than by hiring more police to catch them.⁸ By definition, the *expected punishment* equals the severity of punishment times its probability. A possible explanation for the increased crime rates, at least through the early 1990s, one that is in keeping with the economic theory of the previous chapter, is that the expected punishment for committing a *serious* crime (violent or not) fell over the last four decades of the 20th century in the United States. In the 1950s it was 22 days in jail.

⁷ For a discussion of the policy implications of these connections, see James Q. Wilson, *What to Do About Crime?*, COMMENTARY (September, 1994).

⁸ There are definitional problems in counting police officers. (Should one, for example, include private security guards or only sworn, public police officers?) Setting these issues aside, in 2006 there were almost 700,000 police officers working for states, counties, municipalities, universities, transit systems, and other nonfederal governmental organizations. There were an additional 120,000 federal police officers, for a national total of about 820,000 police. Those figures have not increased much since 2006.

By the early 1980s it was just 11 days. For juveniles the expected punishment during this period was particularly low.⁹ However, these figures began to change in the mid-1980s so that average expected punishment for a wide range of crimes rose. As we have seen, crimes began to fall in the early 1990s and have continued to fall throughout the first decade of the 21st century. These broad patterns seem to be explained by the economic theory of crime and punishment. But the connection between crime and expected punishment requires careful analysis using statistics, as we discuss later.



Web Note 13.1

On our website we provide up-to-date statistics on crime in the United States and other countries, links to websites with further information, and some comparative explanations of differences in the amount of crime in various countries.

B. Social Cost of Crime

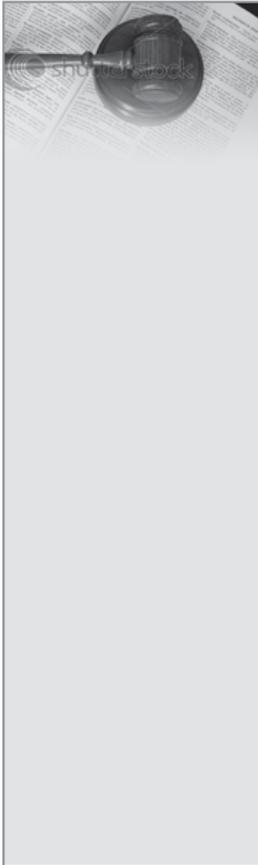
Now we turn from the quantity of crime to its costs. We may divide the social cost of crime into the losses to victims (property and personal losses) and the cost of preventing crime (public and private). We can make a rough estimate of each of these elements in order to compute the social costs of crime in the United States in a recent year.

The easiest costs to document are state expenditures on preventing crime and punishing criminals. Spending on the criminal-justice system in 1992 constituted 7.5 percent of all governmental spending at the local, state, and federal levels. By 2002 the figure had fallen significantly, largely because the Gross Domestic Product (GDP) had risen so dramatically during the 1990s. The total amount spent annually by all levels of government in the United States on the criminal-justice system is well over \$100 billion. Of that total, approximately one-third is spent on police protection. Federal and state prison systems cost about one-third of the total, and prosecutors, public defenders, probation officers, courts, recordkeeping, and so on account for the remaining one-third. More recent statistics are roughly the same, although somewhat distorted by the increase in anti-terrorist efforts.

Expenditures by individuals and private organizations to prevent crime are more difficult to estimate than state expenditures. This money is spent on alarms, private guards, security systems, placing identifying marks on valuable goods, and the like. In 1993, private expenditures to prevent crime in the United States amounted to approximately \$65 billion. By 2003 the figure had risen to close to \$90 billion. By 2008 the figure had risen to more than \$100 billion. (We note from our discussion in the previous chapter that not all private expenditures reduce crime; some simply displaces crime.)

The value of lost property and the losses to individual victims of crime are the most difficult elements of the social costs of crime to estimate. The value of all stolen goods in 1992 was estimated to be \$45 billion. We have only rough estimates of personal losses to victims: For example, the medical costs of attending to those injured in crimes was \$5 billion in 1992, ignoring the many indirect costs of crime to the victims such as trauma, anxiety, and shattered lives. There are reasons to believe that these figures have not increased

⁹ See Wilson, *supra* n. 7.



African Americans and Crime¹⁰

Blacks and whites had, in 1992, identical victimization rates for personal theft. However, for more serious theft (burglary, larceny, and automobile theft) the rate of black victimization was 33 percent higher than the rate for whites. More dramatically, in 1988 blacks accounted for 20 percent of the population in the 75 most populous urban counties in the United States but accounted for 54 percent of all murder victims in those counties.¹¹ Why are black Americans disproportionately victims of violent crime? Professor DiIulio concludes that affluent Americans move to safer communities, choose safer jobs, and enjoy relatively safe forms of recreation, whereas poverty prevents many black Americans from distancing themselves from criminals. (Note that most violent crime in the United States is *intra*racial: Black criminals tend to have black victims, and white criminals tend to have white victims.)¹²

A similar racial disparity exists among criminals. In the 75 most populous counties in the country, blacks account for 20 percent of the population but for 62 percent of all defendants in murder cases. In 1991 the arrest rate for violent crime for young black males was five times higher than for young white males (1,456 per 100,000 for black youth and 283 per 100,000 for white youth).

Disproportionate arrest rates resulted in a disproportionately African American prison population. In 1990, 48.9 percent of all state prisoners and 31.4 percent of all federal prisoners were black. (The proportions were almost the same in 2008.)¹³ Why are black Americans disproportionately perpetrators of violent crime? Professor DiIulio points to the tragic fact that a disproportionate share of African American youth grow up in dysfunctional families and in neighborhoods in which delinquent and deviant behavior is common. Conversely, low crime rates among Chinese immigrants to the United States are often attributed to family and cultural characteristics.¹⁴

¹⁰ The material in this box comes from John J. DiIulio Jr., *The Question of Black Crime*, THE PUBLIC INTEREST (Fall, 1994). See also the commentaries on that article by Glenn C. Loury, James Q. Wilson, Paul H. Robinson, Patrick A. Langan, and Richard T. Gill.

¹¹ For violent crimes of all types, the victimization rate in 1992 was 113 per 1,000 for teenage black males, 94 per 1,000 for teenage black females, 90 for teenage white males, and 55 for teenage white females. For slightly older black males (ages 20–34) the rate was 80; for white males of the same age the rate was 52. Finally, for adult black males between the ages of 35 and 64 the rate was 35; for adult white males, it was 18.

¹² Approximately 84 percent of the single-offender violent crimes committed by blacks are committed against other blacks, and about 73 percent of violent crimes committed by whites are committed against other whites.

¹³ Some contend that the arrest, conviction, and imprisonment records reflect a racist criminal justice system. There is much evidence against this view. A recent National Academy of Sciences study said, “[F]ew criminologists would argue that the current gap between black and white levels of imprisonment is mainly due to discrimination in sentencing or in any of the other decision-making processes in the criminal justice system.” Similarly, a 1991 RAND Corporation study of adult robbery and burglary defendants in 14 large urban areas found no evidence of racial or ethnic discrimination in conviction rates, disposition times, or other important indicators of outcomes.

¹⁴ “During the 1960s, one neighborhood in San Francisco had the lowest income, the highest unemployment rate, the highest proportion of families with incomes under \$4000 per year, the least educational attainment, the highest tuberculosis rate, and the highest proportion of substandard housing. . . . That neighborhood was called Chinatown. Yet in 1965, there were only five persons of Chinese ancestry committed to prison in the entire state of California.” JAMES Q. WILSON & RICHARD J. HERRNSTEIN, *CRIME AND HUMAN NATURE* (1985).

significantly since the early 1990s. One reason is that the total amount of crime has declined in the last 20 years to levels not seen in the United States since the 1930s. Another reason is that the speed and skill with which medical personnel are now able to respond to traumatic injury lowers the medical costs of personal injuries, such as those from gunshot wounds.

If we add these elements, the total cost equals \$500 billion, or approximately 4 percent of the U.S. gross domestic product. This number excludes some immeasurable costs. For example, imprisonment infects a significant group of criminals with AIDS.¹⁵ This number also excludes the cost of reintegrating former prisoners into normal economic and social life after the surge in imprisonment. In 2007 approximately 700,000 prisoners were released from prison—a group equal in size to the population of a large city. Congress passed the Second Chance Act in 2007 to give the states a total of \$100 million over the following two years to help the states design model programs for reintegration of these prisoners. There is no question that such programs are necessary: The best estimate is that two-thirds of those released prisoners will recidivate within three years.

QUESTION 13.1: Do statistics support the perception that the United States has been swept by a wave of crime?

QUESTION 13.2: If expenditures on preventing crime equal \$200 billion and the costs of crime to victims equal at least \$300 billion, could the United States save \$500 billion by abandoning all efforts to prevent crime?

QUESTION 13.3: How would economics try to answer the question, “Does crime increase or decrease as a society becomes more wealthy?”

QUESTION 13.4: When statutes prescribe the exact punishment for each crime, the judge’s discretionary power decreases and the prosecutor’s increases. Predict how this change might affect the charges made against arrested persons.

II. Does Punishment Deter Crime?

In the previous chapter we outlined an economic theory of the decision to commit a crime. According to that theory, an increase in expected punishment causes a decrease in crime, holding other variables constant. The *deterrence hypothesis* holds that crime decreases significantly—in technical terms, the supply of crime is *elastic* with respect to punishment. If so, then increasing the resources that society devotes to the arrest, conviction, and punishment of criminals should reduce the harm caused by crime.

An alternative hypothesis holds that variations in the certainty and severity of punishment do *not* significantly deter criminals. Rather, crime is the result of a complex set

¹⁵ Rucker C. Johnson & Steven Raphael, *Incarceration Trends and Racial Disparities in AIDS Infections*, Goldman School of Public Policy, University of California, Berkeley, Working paper (Fall 2008).

of economic and sociological factors (or possibly biological factors). The appropriate way to minimize the social costs of crime is to attack these root causes of crime—for example, to devote resources to job creation, income maintenance, family counseling, mental health, and drug and alcohol counseling.

Although public debate frames these two hypotheses as mutually exclusive, they might both be correct to some extent. If many variables cause crime, the optimal public policy for reducing it mixes criminal justice and socioeconomic programs.

Which hypothesis is true? We examine the relevant literature and then, at the end of this section, draw a tentative conclusion on the merits of alternative hypotheses. Much of the literature relies on econometrics, which is indispensable in the search for the causes of crime, but also susceptible to misuse and mistake.¹⁶

A. Deterrence

The usual statistical study of deterrence seeks to explain a certain kind of crime as a function of deterrence, economic, and sociological variables. These explanatory variables include, first, proxies for the probability of punishment (for example, the probabilities of being detected, arrested, and convicted) and the severity of punishment (for example, average prison sentence); second, labor market variables such as the unemployment rate and the income level of the jurisdiction; and third, socioeconomic variables such as the average age, race, and urbanization of the jurisdiction's population. The statistics may be from a single jurisdiction over time, or from different jurisdictions at the same point in time, or both.

Numerous empirical studies have this form. Here we discuss three especially noteworthy examples. First, a famous study by Isaac Ehrlich used data on robbery for the entire United States in 1940, 1950, and 1960 to estimate the deterrence hypothesis and concluded that, holding all other variables constant, the higher the probability of conviction for robbery, the lower the robbery rate.¹⁷ Second, Alfred Blumstein and Daniel Nagin studied the relationship between draft evasion and penalties for that crime in the 1960s and 1970s. They concluded that a higher probability of conviction and a higher level of penalty caused a lower rate of draft evasion.¹⁸ Third, a study by Kenneth

¹⁶ We mention two general problems with all statistical studies of deterrence. First, the accuracy of the data on the number of crimes differs significantly among jurisdictions at any point in time, and within a jurisdiction at different points in time. For example, some crimes are almost always reported to the authorities; some are rarely reported; and these reporting discrepancies differ over time and among jurisdictions. These inaccuracies may create spurious statistical relationships. (See Web Note 13.1 for more on this topic.) Second, estimated models omit some important but difficult-to-measure variables, such as whether adults were abused as children. If omitted variables correlate with included variables, the estimated relationship will be biased. Over time, improvements in measuring variables and better statistical techniques tend to overcome these two weaknesses in deterrence studies.

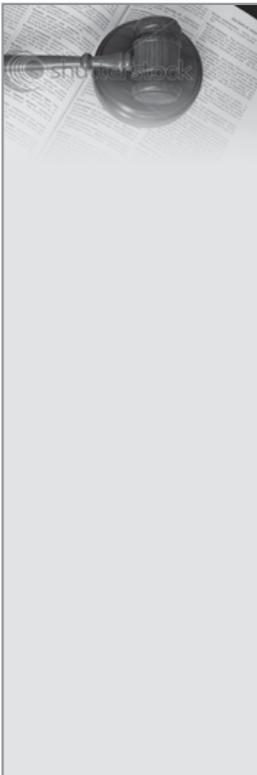
¹⁷ Isaac Ehrlich, *Participation in Illegitimate Activities: A Theoretical and Empirical Investigation*, 81 J. POL. ECON. 521 (1973). Ehrlich also found that there was no deterrent effect attributable to the severity of punishment, as measured by the average length of a prison sentence for robbery in the years 1940 and 1960, but that there was such a deterrent effect in 1950.

¹⁸ Alfred Blumstein & Daniel Nagin, *The Deterrent Effect of Legal Sanctions on Draft Evasion*, 28 STAN. L. REV. 241 (1977).

Wolpin used time-series data from England and Wales over the lengthy period 1894–1967 to test for a deterrent effect in those countries. Wolpin found that crime rates in the United Kingdom were an inverse function of the probability and severity of punishment.¹⁹

These (and other) studies found a significant deterrence effect. The National Research Council of the U.S. National Academy of Sciences established the Panel on Research on Deterrent and Incapacitative Effects in 1978 to evaluate the many academic studies of deterrence. The panel concluded that “the evidence certainly favors a proposition supporting deterrence more than it favors one asserting that deterrence is absent.”²⁰

These studies seek to explain the “crime rate,” which is a highly aggregated statistic. Rather than studying crime rates, another approach to measuring deterrence studies the behavior of small groups of people. We know that a relatively small proportion of the population commits a large proportion of the crime. Economists have had some success in predicting who will become violent criminals. (See box titled “Guilty of Future Crimes.”) We describe two studies on deterring offenses by such people.



Guilty of Future Crimes

Social scientists have modestly increasing abilities to predict crime. For example, Peter Greenwood’s study for RAND titled *SELECTIVE INCAPACITATION* (1982) found that high-rate criminal offenders could be predicted as having seven characteristics: (1) conviction of a crime while a juvenile; (2) use of illegal drugs as a juvenile; (3) use of illegal drugs during the last two years; (4) employment less than 50 percent of the time in the previous two years; (5) incarceration in a juvenile facility; (6) imprisonment during more than 50 percent of the last two years; and (7) a previous conviction for the current offense.

A controversial conclusion that some people reach is that criminals with these characteristics should be incapacitated in prison for a longer period than other criminals. For example, M. Moore, S. Estrich, D. McGillis, and W. Spelman give “qualified endorsement” to a policy of “selective incapacitation” in *DANGEROUS OFFENDERS: THE ELUSIVE TARGET OF JUSTICE* (1985). Of course, decisions about whether to grant bail, about the severity of punishment, and about parole are all currently made on the basis of predictions about the criminal disposition of the offender. In *Barefoot v. Estelle*, 463 U.S. 880 (1983), *reh. den.* 464 U.S. 874 (1983), the U.S. Supreme Court allowed psychiatric testimony on an individual’s likely future dangerousness to be put before a jury that was deciding whether the defendant should be given the death penalty.

QUESTION 13.5: Does efficiency require the adjustment of punishment according to predictions about future crime? Is doing so unfair?

¹⁹ Kenneth Wolpin, *An Economic Analysis of Crime and Punishment in England and Wales 1894–1967*, 86 J. POL. ECON. 815 (1978). The data were better than any comparable data from the United States and, because of the length of the time period covered, allowed for considerable flexibility in the hypotheses tested.

²⁰ BLUMSTEIN, COHEN, & NAGIN, EDS., *DETERRENCE AND INCAPACITATION: ESTIMATING THE EFFECTS OF CRIMINAL SANCTIONS ON CRIME RATES* (1978). A critique of that report may be found in Ehrlich & Mark, *Fear of Deterrence*, 6 J. LEGAL STUD. 293 (1977).

First, Professor Ann Witte followed the post-release behavior of 641 convicted criminals for three years. She gathered information on whether the men were arrested again during that period (about 80 percent were), on their previous convictions and imprisonments, on their labor-market experience after release, and on whether they were addicted to alcohol or drugs. Professor Witte tested the hypothesis that conviction and imprisonment induced these high-risk offenders to engage in fewer crimes in the future. She concluded that the higher the probability of conviction and imprisonment, the lower the number of subsequent arrests per month out of prison.²¹

Second, Charles Murray and Louis Cox, Jr., tracked the records of 317 Chicago males, with an average age of 16, who had been imprisoned for the first time by the Illinois Department of Corrections. Notwithstanding their youth, this was a hardened group of young men: Before receiving their first prison sentences, they averaged 13 prior arrests per person; as a group, they had been charged with 14 homicides, 23 rapes, more than 300 assaults, more than 300 auto thefts, almost 200 armed robberies, and more than 700 burglaries. The average sentence for their offenses was 10 months. Murray and Cox followed these young offenders for about 18 months after their release and found that during that period, the group's arrest record fell by two-thirds. The authors concluded that imprisonment served as a deterrent to future crime for this high-risk group.²²

Governments seldom conduct experiments for social scientists by changing criminal laws in order to test for deterrence effects. Sometimes, however, governments change such laws for political reasons, and the change presents social scientists with a "natural experiment" to test for deterrence. In July 2006, the Italian Parliament passed the Collective Clemency Bill, which provided for an immediate three-year reduction in the prison sentences of all inmates who had committed a crime before May 2, 2006, and been sentenced to imprisonment for a term of greater than three years. Approximately 22,000 inmates—about 40 percent of the Italian prison population—were released under the bill's terms on August 1, 2006. The bill further said that if a former inmate who had been released under the bill committed a crime within five years of his release, he would be required to serve the remaining sentence suspended by the pardon (which varied between one month and 36 months) and the sentence given for the newly committed crime.

Francesco Drago, Roberto Galbiati, and Pietro Vertova recognized that these terms created an interesting experiment in deterrence. The possible variations in the sentences that might be imposed on former inmates for the same crime in the future (consisting of the mandated sentence for the new crime plus the add-on from the time not served from the previous conviction) created a natural experiment that might be used to measure the effects

²¹ Ann Witte, *Estimating the Economic Model of Crime with Individual Data*, 94 Q. J. ECON. 57 (1980). Additionally, she discovered that the strength of the deterrent effect varied between different classes of potential offenders. For those who engaged in serious, including violent, crimes, severity of punishment had a stronger deterrent effect than certainty of punishment. For those who engaged in property crimes, certainty of arrest and conviction had a stronger deterrent effect than severity of punishment. The deterrent effect was weakest for drug addicts. Lastly and somewhat surprisingly, the ease of subsequent employment had no significant effect on future criminal offenses.

²² C. A. MURRAY & L. A. COX, JR., *BEYOND PROBATION: JUVENILE CORRECTIONS AND THE CHRONIC DELINQUENT* (1979). Note that Murray and Cox found that rearrest rates were higher for comparable juveniles who had *not* been imprisoned but instead were put on probation.

of increased prison sentences on the decision to commit a crime. Their statistical analysis concluded that “a marginal [one month] increase in the remaining sentence reduce[d] the probability of recidivism by 0.16 percent points.” The authors went on to estimate an elasticity of crime with respect to prison sentences and found that figure to be approximately -0.74 —that is, a 10 percent increase in prison sentence for committing a particular crime could be expected to lead to a 7.4 percent decrease in the amount of that crime committed.²³

Economics has assimilated findings in cognitive psychology that are changing the analysis of deterrence. Perhaps the most important finding is that people are too shortsighted to be deterred by long criminal sentences. If the punishment increases from, say, two years in prison to three years, the additional years has little effect on deterring criminals, especially the young men who commit most violent crimes. Lee and McCrary demonstrated this fact in a remarkable study. The length of the sentence faced by a person who commits a crime increases sharply on the criminal’s eighteenth birthday. Consequently, the deterrence hypothesis predicts a sharp decrease in crime when juvenile delinquents turn eighteen. A careful statistical analysis of Florida arrest data shows no discontinuity in the probability of committing a crime at the age of majority. So, the longer punishments when the criminal turns eighteen apparently are not deterring them from committing crime. This fact has a simple, powerful implication for criminal justice policy: Shortening sentences and redirecting expenditures away from prisons and towards police, which would decrease the severity of the punishment and increase its certainty, would deter more crimes at no more expense to taxpayers.²⁴

In the same spirit as the Lee and McCrary finding, Paul Robinson of the University of Pennsylvania School of Law and John Darley of the Department of Psychology at Princeton University have argued that criminal law does not deter.²⁵ Let us be very careful about what the authors claim: They believe that the criminal justice system probably does deter crime, but they are very doubtful that criminal *laws* deter crime. They want to draw a distinction between such actions as the legislative manipulation of sentence length, which they believe does *not* have a deterrent effect, and such actions as increasing police patrols or the harshness of prison conditions, which they believe might deter crime.

The authors base their contention on findings in the behavioral sciences. They write that for criminal law to have a deterrent effect on a potential criminal’s conduct choices, the “following three questions must all be answered in the affirmative:

1. Does the potential offender know, directly or indirectly, and understand the implications for him, of the law that is meant to influence him? That is, does the potential offender know which actions are criminalized by criminal

²³ Drago, Galbiati, & Vertova, *The Deterrent Effects of Prison: Evidence from a Natural Experiment*, 119 J. POL. ECON. 257 (2009).

²⁴ David Lee and Justin McCrary, “Crime, Punishment, and Myopia,” NBER Working Paper No. W11491 (2005). An earlier study found some effect of harsher punishments at the age of majority. See Steven Levitt, *Juvenile Crime and Punishment*, 106 J. POL. ECON. 1156 (1998).

²⁵ Robinson & Darley, *Does Criminal Law Deter?: A Behavioral Science Investigation*, 24 OXFORD J. LEGAL STUD. 173 (2004).

codes, which actions are required, and which conditions will excuse actions which are otherwise criminal?

2. If he does know, will he bring such understanding to bear on his conduct choices at the moment of making his choices?
3. If he does know the rule and is able to be influenced in his choices, is his perception of his choices such that he is likely to choose compliance with the law rather than commission of the criminal offense? That is, do the perceived costs of noncompliance outweigh the perceived benefits of the criminal action so as to bring about a choice to forgo the criminal action?"²⁶

Robinson and Darley argue that there is evidence that none of these premises is true. First, they report on surveys that they and others have conducted in different states about a limited number of legal rules to ascertain how well a random sample of citizens know prevailing criminal laws. One survey found that a survey of a "target population" (not the general population) of potential offenders found that 18 percent of them had no idea what the sanctions for several crimes would be; 35 percent said that they did not pay attention to what the sanction would be; and only 22 percent thought they knew exactly what the punishment would be. So, the authors conclude that "people rarely know the criminal law rules."²⁷

Robinson and Darley also point out that the overall rate of conviction for crimes is extremely low—approximately 1.3 percent of all crimes result in a conviction, and the chances of a convicted criminal's receiving a prison sentence is about 100-to-1 for most offenses; "even the most serious offenses, other than homicide, have conviction rates of single digits." Many in the general population may not know these facts. Rather, they may believe that the chances of being detected, arrested, and convicted are much higher and are, therefore, deterred from committing crime. But career criminals and their friends and relatives are likely to know how low the conviction and punishment rates really are.

One of the most intriguing points that Robinson and Darley make is that the duration of prison sentences may not have a deterrent effect. They note that people adapt fairly quickly to changed circumstances; for instance, there is evidence that within six months of incarceration prisoners have returned to their pre-incarceration level of subjective well-being. And there is compelling evidence that in remembering experiences, we all suffer from "duration neglect"—that is, we do not accurately remember the duration of good or bad experiences. So, thoughts of imprisonment may deter those of us who have not been "inside," but perhaps those who have been imprisoned recall the experience as not as bad as they had anticipated.

Robinson and Darley summarize unpublished work by Anup Malani of the University of Chicago Law School on the deterrent effect of the felony-murder rule. That rule penalizes *any* death that occurs during the commission of a crime as if it were an intentional killing. Clearly, legislators passed the felony-murder rule in the hope that criminals would take greater care during the commission of a crime by, for example, not carrying a gun and might be deterred from committing serious crimes altogether. So, the hope was that the

²⁶ *Id.* at 175.

²⁷ They recognize that this is an overgeneralization. Many people know about important inflection points in the criminal sanctions, that, for example, the penalties for a given crime jump considerably when a juvenile becomes an adult. So, it should not be surprising to learn that when juveniles pass the age to become an adult, they commit fewer crimes. See Levitt, *supra* n. 24.

rule might not only lower the rate of serious injury in the commission of crimes but also lower the rate of serious crimes, such as robbery. Malani gathered data to see if he could establish the effects of the felony-murder rule on serious crime. Surprisingly, he found that the rule has had the perverse effect of “increase[ing] the rate of deaths during a robbery.” Similarly with regard to rape, the overall effect of the rule was to increase the total deaths during rape by 0.15–0.16 percent. Why these perverse results obtain is still unclear.²⁸



Web Note 13.2

We provide some additional information on the behavioral analysis of crime and punishment on our website.

B. Economic Conditions and Crime Rates

Committing a crime takes time and effort that could go elsewhere, such as earning money legally. A rational, amoral criminal responds to the opportunity cost of crime; so, an increase in the opportunities for earning income legally should cause a decrease in criminality. If opportunity cost has a powerful effect, then among the best policies for reducing the amount of crime are those that ameliorate economic and social conditions. For example, from 1991 to 2001 the United States had the longest period of peace-time prosperity without a recession in its history, and, as we know, this corresponded with a dramatic downturn in all sorts of crime, both violent and nonviolent. Was the economic prosperity a cause of the downturn in crime? We review briefly some empirical studies of the extent to which employment and income-enhancing policies reduce the amount of crime. (We do not discuss the statistical studies of the influence of early family life, heredity, and other noneconomic factors on crime rates.²⁹)

Perhaps unemployed workers commit crimes to gain income or to deal with their idle time and frustration, so that worsening employment conditions lead to an increase in the amount of property crimes. Is there a discernible relationship between cyclical fluctuations in economic conditions and crime rates? There is mixed evidence on this point. In a 1981 survey of the literature up to that date, Thomas Orsagh and Ann Witte found little evidence of a significant relationship.³⁰ Cook and Zarkin found a small increase in the number of burglaries and robberies during recent recessions, no correlation between the business cycle and homicides, and a countercyclical relationship between economic conditions and auto theft. They also found that long-term trends in crime rates were independent of the

²⁸ Randi Hjalmarsson, *Crime and Expected Punishment: Changes in Perceptions at the Age of Criminal Majority*, AM. L. & ECON. REV. (forthcoming 2010).

²⁹ See, for example, WILSON & HERRNSTEIN, *supra* n. 14.

³⁰ Orsagh & Witte, *Economic Status and Crime: Implications for Offender Rehabilitation*, 72 J. CRIM. L. & CRIMINOL. 1055 (1981). This study follows up a literature survey by Robert Gillespie. Gillespie found three studies that discovered a significant relationship between unemployment and crime and seven that did not. Robert W Gillespie, *Economic Factors in Crime and Delinquency: A Critical Review of the Empirical Evidence*, pp. 601–626 in UNEMPLOYMENT AND CRIME: HEARINGS BEFORE THE SUBCOMMITTEE ON CRIME OF THE COMMITTEE ON THE JUDICIARY (House of Representatives; Washington, D.C.: U.S. Government Printing Office, 1978).

business cycle.³¹ And as already noted, the continuing decline in crime through the Great Recession of 2008–2010 seems to indicate that there is a very weak connection between aggregate economic conditions and crime rates.

These negative results do not necessarily contradict the economic theory of deterrence. In that theory, the business cycle influences the opportunity cost of crime and also the opportunities for crime. These two influences work in opposite directions. As the economy worsens, criminals have fewer opportunities for legitimate earnings, and also fewer opportunities for crime. For example, unemployment creates a motive to sell cocaine and also reduces the number of potential customers.³² It follows that as the economy improves, the opportunity cost of crime increases, but so, too, does the take to be had from successful crime. Which of these forces dominates is still somewhat in doubt. (We return to that connection in Section VII.)

C. Does Crime Pay?

Most people never commit crime, but some people make a career of it. These career criminals apparently believe that the benefits of crime exceed the expected punishments. Why do career criminals reach a different conclusion from the rest of us? Is crime very profitable for them, or is legitimate work unprofitable for them, or do they have special attitudes toward risk and special valuations of time?

To address these questions, James Q. Wilson and Allan Abrahamse (in *Does Crime Pay?* 9 JUSTICE QUARTERLY 359 (1992)) compared the gains from crime and from legitimate work for a group of career criminals in state prisons in three states. Wilson and Abrahamse divided prisoners into two groups: mid-rate offenders and high-rate offenders. Using data from the National Crime Survey's report of the average losses by victims in different sorts of crimes, the authors estimated the annual income for criminals.³³ They then compared these estimates of the income from crime with the prisoners' estimates of their income from legitimate sources. Two-thirds of the prisoners had reasonably stable jobs when they were not in prison and, on average, the prisoners believed that they made \$5.78 per hour at those legitimate jobs.

³¹ Philip J. Cook & Gary A. Zarkin, *Crime and the Business Cycle*, 14 J. LEGAL STUD. 115 (1985). This is, perhaps, surprising given the correlation between the business cycle and less serious property crimes and the usual belief that there is a correlation between those property crimes and homicides. See also Richard Freeman, *Crime and Unemployment*, in JAMES Q. WILSON, ED., CRIME AND PUBLIC POLICY (1983), and James Q. Wilson & Philip J. Cook, *Unemployment and Crime—What Is the Connection?*, 79 PUBLIC INTEREST 3 (1985).

³² An excellent discussion of the literature on deterring crime through increasing the benefits of legal alternatives may be found in WILSON, THINKING ABOUT CRIME (rev. ed. 1983), pp. 137–142.

³³ For example, they estimated that the value of a stolen car was 20 percent of its market value. And following a study of drug dealing in Washington, D.C., they estimated that the net income of the average drug dealer was \$2,000 per month. More recent survey evidence by Levitt and Venkatesh suggests that the annual incomes of most drug dealers is much less than that of minimum-wage employees (see *Freakonomics* Ch. 3 (“Why Do Drug Dealers Still Live with Their Moms?”) (2006)). Levitt and Venkatesh have also written on the economics of street prostitution, showing that it is not at all financially rewarding (see “An Empirical Analysis of Street-Level Prostitution” (September, 2007) and *Superfreakonomics* Ch. 1 (“How Is a Street Prostitute Like a Department-Store Santa?”) (2009)).

TABLE 13.1
Criminal and Legitimate Earnings per Year (1988 Dollars)

Crime type	High-Rate		Mid-Rate	
	Crime	Work	Crime	Work
Burglary/theft	\$5,711	\$5,540	\$2,368	\$7,931
Robbery	6,541	3,766	2,814	5,816
Swindling	14,801	6,245	6,816	8,113
Auto theft	26,043	2,308	15,008	5,457
Mixed	6,915	5,086	5,626	6,956

Source: Wilson & Abrahamse, *Does Crime Pay?*, 9 JUSTICE Q. 359, 367 (1992).

As Table 13.1 indicates, for mid-rate criminals, working pays more than crime for every type of crime except auto theft. For high-rate offenders, however, crime paid more than legitimate work for *all* crimes except burglary. These figures concern the income from crime, but not the major cost of crime to these criminals: time in prison. When the authors included those costs, the net income from crime fell below the income from legitimate work for both mid-rate and high-rate offenders.

Why, then, do career criminals commit crime? Wilson and Abrahamse consider and reject two explanations. First, the prisoners may have felt they had to commit crime because they had no meaningful opportunity for legitimate work. The authors doubt this view: Two-thirds of the prisoners were employed for some length of time during the period examined. Second, the prisoners may have had such serious problems with alcohol and drugs that they could not hold legitimate jobs. The authors argue that although two-thirds of the offenders had drinking or drug problems, the evidence from other studies indicates that these problems do not normally preclude legitimate employment. Wilson and Abrahamse conclude that career criminals are “temperamentally disposed to overvalue the benefits of crime and to undervalue its costs” because they are “inordinately impulsive or present-oriented.” In economic terms, these people discount punishments for uncertainty and futurity more highly than other people do.

QUESTION 13.6: How could the collection of uniform crime statistics contribute to studies of deterrence?

QUESTION 13.7: Describe how statisticians might ideally separate the effect of the business cycle on the opportunity cost of crime and its profitability.

QUESTION 13.8: Assume that criminals discount risk and futurity more than other people. What policies might reduce crime by changing this fact?

D. Abortion and Crime

The economic analysis of crime hypothesizes that the level of punishment and its certainty, the level of legitimate economic opportunity, the age structure of the population, and other socioeconomic factors provide a relatively complete explanation for the level of

crime in a particular time and place. The four-point pattern of recent crime in the United States that we outlined at the beginning of this chapter has been investigated using the independent variables that we just noted. However, a controversial article by John Donohue and Steve Levitt offers a very different explanation for the recent decline in the amount of crime—the legalization of abortion in 1973.³⁴

The heart of their contention is that when the U.S. Supreme Court legalized abortion in *Roe v. Wade* in January 1973, there was a significant increase in the number of abortions—from under 750,000 in 1973 (when live births totaled 3.1 million) to 1.6 million legal abortions per year in 1980 (when live births totaled 3.6 million). Donohue and Levitt hypothesize that the increase in abortions can account for one-half of the observed decline in the amount of crime after 1991. All other factors taken together account for the remaining half. (We examine the other factors in Section VII.)

Donohue and Levitt divide legalized abortion's effect on the decline in crime into two effects—the “cohort size” effect and the “cohort quality” effect. The cohort size effect points to the reduction in the number of 18-year-old males beginning in 1991 as an important explanation of the decline in crime. But they also contend, controversially, that the “quality” of the young men who were not born because of abortion after 1973 was such that they would have been even more likely to commit crime and other anti-social acts than average 18-year-olds. The reasons are that “women who have abortions [teenage mothers, unmarried women, and the economically disadvantaged] are most likely to be those most at risk to give birth to children who would engage in criminal activity.” Women tend to use abortion as a method of altering the timing of childbearing; they may wait until later when their economic or personal situation improves. Children are then born into better environments.

The authors point to five statistical factors in support of their hypothesis. First, there was a smaller number and proportion of the population in the high-crime ages in the early 1990s, in large part because of the increase in abortions beginning in 1973. Second, five states legalized abortion in 1970, before the Supreme Court legalized abortion in *Roe v. Wade*, and the decline in crime rates occurred earlier in those five states than it did in the rest of the country. Third, there is a statistically significant correlation between “higher rates of abortion in the late 1970s and early 1980s [and] lower crime rates [in those states] for the period 1985 to 1997.” Fourth, there is no correlation between higher abortion rates in the mid- or late 1970s in a state and crime rates in that state between 1972 and 1985. And fifth, almost all of the decline in crime in the 1990s can be “attributed to reduction in crime among the cohorts born after abortion legalization[;] [t]here is little change in crime among older cohorts [over the last 30 years].”

Donohue and Levitt attribute about half of the entire decline in all crime in the 1990s to the effects of legalized abortion. Of that half, they attribute 50 percent to the “cohort size” effect and 50 percent to the “cohort quality” effect. However, their statistical research has not fared well under intense scrutiny. Abortion rates seem to lose their

³⁴ John J. Donohue III & Steven D. Levitt, *The Impact of Legalized Abortion on Crime*, 116 Q. J. ECON. 379 (2001). Interestingly the article first appeared on the SSRN Legal Scholarship network in 2000, from which there were a large number of downloads. *The New York Times* and other national publications reported on the study's findings well before the final version appeared in the *Quarterly Journal of Economics*.

significance when the regressions are redone by using more accurate crime rates of the age-relevant cohorts.³⁵ The only correction for inadequate econometric analysis is better econometric analysis, which the future will bring to the study of crime and abortion.



Web Note 13.3

For more on the Donohue and Levitt hypothesis, critiques of that hypothesis, an extension of the hypothesis that looks at the behavior of teenage girls, and links to other literature on the causes of the decline of crime in the 1990s, see our website.

III. Efficient Punishment

What forms of punishment do we actually use in the United States and how efficient are they? In this section we first examine the social benefits and costs of imprisonment and then look at the benefits and costs of monetary fines as a deterrent to crime. We argue that the U.S. criminal justice system relies too much on incarceration and too little on fines.

A. Imprisonment

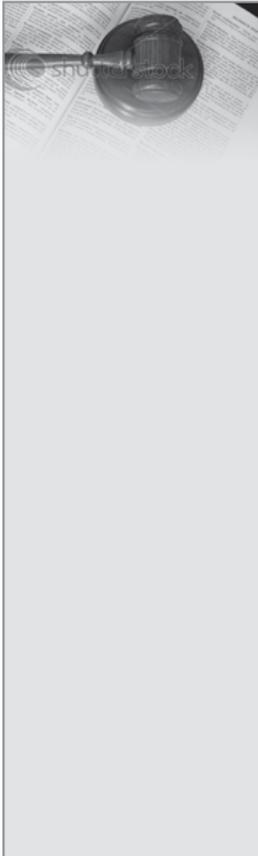
1. The Social Benefits of Imprisonment In principle, incarceration has at least four social benefits: (1) deterrence, (2) retribution, (3) rehabilitation, and (4) incapacitation. We have already discussed empirical evidence on deterrence. We consider the three remaining benefits in turn.

First, “retributivism” holds that justice requires punishing criminals in proportion to the seriousness of their crimes. In principle, varying the length of the sentence allows the state to adjust the shame and personal cost of imprisonment until it is proportional to the seriousness of the crime. You may think that economics concerns efficiency and has nothing to say about this problem of justice. In reality, economics has something to say about any explicit policy goal, including fairness. (See the box titled “Retribution and Economics.”)

The next benefit allegedly derived from imprisonment is “rehabilitation,” which means that prison changes criminals so that, after their release, they do not commit future crimes. For example, prison might teach the criminal a marketable job skill or provide religious instruction that induces them to eschew crime. The ideal of rehabilitation, which once enjoyed favor in the United States, has fallen out of favor, partly because rehabilitative programs show poor results.³⁶ Expenditures in U.S. prisons on counseling, job training, and general education have declined in recent years.

³⁵ Ted Joyce, *A Simple Test of Abortion and Crime*, 91 REV. ECON. & STAT. 112 (2009). Our thanks go to Justin McCrary for advice on this difficult topic. See also Ted Joyce, “Abortion and Crime: A Review,” NBER Working Paper, June, 2009. These and other criticisms of Donohue and Levitt’s study are summarized in Web Note 13.3.

³⁶ See FRANCIS ALLEN, *THE DECLINE OF THE REHABILITATIVE IDEAL* (1981).



Retribution and Economics

According to the principle of retribution, justice requires absolving the innocent and punishing the guilty in proportion to their crimes. Conversely, injustice results from punishing the innocent, absolving the guilty, or punishing the guilty out of proportion to the seriousness of their crimes. To avoid these injustices, officials who arrest and prosecute people must have good information about who did what. Given the cost of information, officials make mistakes. Punishing the innocent is called a “false positive” by statisticians, or a “Type I error.” Not punishing the guilty is called a “false negative” or a “Type II error.”

As officials increase the efficiency of the criminal-justice system, a point is reached where one type of error cannot be reduced without increasing errors of the other type. To illustrate, assume that the prosecutor ranks cases from weak to strong according to the probability of obtaining a conviction. A cutoff point is selected, above which all cases are prosecuted and below which cases are not prosecuted. Raising the cutoff, so that cases are only prosecuted with a high probability of obtaining a conviction, decreases false positives (punishing the innocent) and increases false negatives (not punishing the guilty). Lowering the cutoff has the opposite effect.

One way to choose the cutoff is by finding the point where the expected social cost of false positives equals the expected social cost of false negatives. If punishing an innocent person has more social cost than not punishing a guilty person, then the cutoff will be chosen at a point favoring the accused. Justice, as represented by the principle of retribution, and efficiency, as represented by minimizing the social costs of crime, come together when balancing false positives and false negatives. The two come together because the social cost of false imprisonment or mistaken release from prison depends upon beliefs about justice.

The final social benefit, “incapacitation,” refers to the fact that, while confined, an offender cannot commit crimes against people outside prison. Even if prison fails to deter or rehabilitate, imprisonment may reduce crime by incapacitating criminals. Most recent studies indicate that about two-thirds of all inmates had criminal records before their current stay in prison. Additionally, between 25 percent and 50 percent of all offenders are arrested within a very short time of their release from prison—usually within six months to one year. And two-thirds will recidivate within three years. According to a Brookings Institution study, violent criminals who pass in and out of prison commit 12 serious crimes per year on average while out of prison (excluding drug crimes).³⁷

From facts such as these, people conclude that incapacitation significantly lowers crime rates. These facts, however, require scrutiny. Two conditions must be met in order for incarceration to reduce crime rates. First, criminals incapacitated by imprisonment must not be replaced immediately by new criminals. For example, if imprisoning one drug dealer immediately results in his replacement by someone else, then incapacitation does not reduce total sales of drugs. In technical terms, *incapacitation is most effective at reducing crime when the supply of criminals is inelastic*. In general, inelastic supply results from a fixed factor of production. For example, an important drug dealer may have superior knowledge of illegal markets, so that after his arrest, no one else can quickly take his place.

³⁷ John J. DiIulio, *The Costs of Crime*, BROOKINGS REVIEW (Fall, 1994).

Second, in order for incarceration to reduce crime, imprisonment must reduce the total number of crimes committed by repeat offenders over their criminal careers. For some criminals, incarceration affects the timing, but not the number, of their crimes. To see why, consider that punishment typically grows more severe with each criminal conviction of a repeat offender. Suppose that after, say, the second conviction, the prospect of a very severe punishment for a third conviction causes this person to stop committing crimes. In this example, the fact that the person could not commit crimes while in jail after each of the first two convictions might not influence the total number of crimes the person committed. Rather, the time spent in jail just delayed the arrival of the day the criminal received the second conviction. The punishment for a third conviction could be so severe as to deter any further crime. In general, if a person commits crimes until the expected punishment exceeds the benefit, the deterrent effect of imprisonment determines how many crimes the person commits, and incapacitation has no independent effect. (See the box on “Three Strikes.”)

Now consider the opposite kind of criminal. For this person, the urge to commit crime is irresistible in youth and fades with age. If the state keeps such a person in prison during her youth and releases her later in life, she will commit fewer crimes over her criminal career. Thus, incapacitation reduces the rate of crimes caused by youthfulness.

The fact that repeat offenders commit fewer crimes as they get older could be due to biological and sociological factors associated with aging, or it could be due to the higher expected penalties faced as their criminal records lengthen.

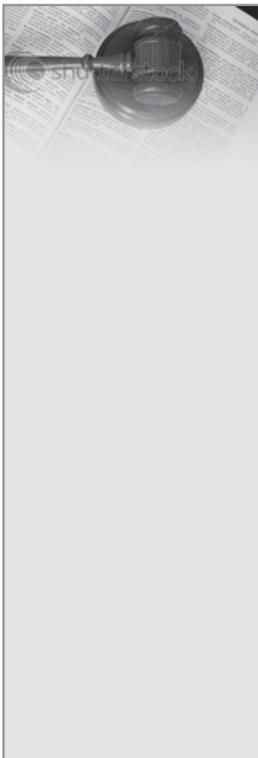
Distinguishing incapacitation effects and deterrence effects from incarceration is a complicated empirical issue. On the one hand, as we have seen, putting someone in jail or prison may reduce the amount of crime simply because the incarcerated cannot commit crimes. (The literature refers to this as “specific deterrence.”) On the other hand, putting someone in jail or prison may reduce crime because other people observe the punishment meted out to a convicted criminal and decide not to commit a crime so as to avoid suffering the same punishment. (The literature refers to this as “general deterrence.”) Either or both effects (or neither) are possible and disentangling them has proven to be a very taxing empirical task.

In the late 1990s, Dan Kessler and Steve Levitt published a paper in which they reported finding a method of distinguishing incapacitation and deterrence effects from incarceration and criminal sanctions generally.³⁸ In June 1982, voters in California passed a proposition (Proposition 8) that provided for immediate sentence enhancements for certain eligible crimes (murder, rape, robbery, burglary of a residence, and firearm assault): Upon conviction of any of the specified offenses, the defendant would receive a five-year increment to his or her incarceration for each prior conviction of a serious felony. The passage and implementation of the proposition provided what economists call a “natural experiment” to distinguish incapacitation from general deterrence. Kessler and Levitt recognized that any immediate decline in the amount of the crimes eligible for the sentence enhancements could not be attributed to incapacitative effects but rather to marginal deterrence effects. Kessler and Levitt found that there was an

³⁸ Daniel Kessler & Steven D. Levitt, *Using Sentence Enhancements to Distinguish Between Incapacitation and Deterrence*, 42 J. LAW & ECON. 343 (1998).

almost immediate decline of 4 percent in crimes eligible for sentence enhancements in California in the year after voters passed the proposition and that the declines in those crimes continued for years to come.³⁹ This is one of the most dramatic and careful studies finding a deterrence effect from criminal sanctions that can be distinguished from incapacitating effects of imprisonment.

2. The Social Costs of Imprisonment The social costs of imprisonment include the direct costs of building, maintaining, and staffing prisons, and the opportunity cost of losing the productivity of imprisoned people. As to direct costs, recent



“Three Strikes” Law

California passed the nation’s first “three strikes” legislation through a citizens’ initiative in 1994. The measure passed with 72 percent of the votes, largely in reaction to the murder of 12-year-old Polly Klaas, who was kidnapped from a slumber party and murdered by a violent criminal who had recently been paroled. Three strikes laws, which have been passed in 26 states, call for significant sentence enhancement when an offender is convicted of his or her third felony. Usually, the first two offenses must be either violent or serious, but the third felony, which triggers the law, does not have to be either violent or serious. The sense of the laws is that someone who commits a third felony is a “habitual offender” and demonstrably not deterred by normal criminal sanctions. So, in California the sentence for the third felony is typically life in prison.

There are currently approximately 8,500 prisoners in California serving life sentences for a third felony. Of those, approximately 40 percent or 3,700 prisoners are serving that life sentence for a third felony that was neither violent nor serious. An initiative put to the voters in 2004 sought to remove nonviolent property and drug offenses from the list of three strikes felonies. But the measure was defeated, receiving slightly less than half of the votes.⁴⁰

There is evidence that the three strikes law in California has been effective. Eric Helland and Alex Tabarrok did a sophisticated econometric study of the deterrent effect of the three strikes law and found that it “significantly reduces felony arrest rates among the class of criminals with two strikes by 17–20 percent.”⁴¹

³⁹ The Kessler-Levitt study is criticized in Cheryl Marie Webster, Anthony N. Doob, & Franklin E. Zimring, *Proposition 8 and Crime Rates in California: The Case of the Disappearing Deterrent*, 5 *CRIMINOLOGY & PUB. POL’Y* 417 (2006). But see Levitt, *The Case of the Critics Who Missed the Point: A Reply to Webster et al.*, 5 *CRIMINOLOGY & PUB. POL’Y* 449 (2006).

⁴⁰ It is probably the case that the law on the books and the law in action are different with regard to third strike sentencing. Prosecutors rarely invoke the three strikes law if the third felony was not violent or serious. Also, California judges have decided that they can define a “felony” differently from how they are defined in statutes so that they can treat a nonviolent felony as if it were a misdemeanor that does not count as a third strike.

⁴¹ Helland & Tabarrok, *Does Three Strikes Deter?: A Nonparametric Estimation*, 22 *J. HUMAN RESOURCES* 309 (2007). See also Emily Bazelon, *Arguing Three Strikes*, *NEW YORK TIMES SUNDAY MAGAZINE*, May 17, 2010; and FRANKLIN ZIMRING, GORDON HAWKINS & SAM KAMIN, *PUNISHMENT AND DEMOCRACY: THREE STRIKES AND YOU’RE OUT IN CALIFORNIA* (2001), who find that the three strikes laws have no discernible deterrent effect, are administratively awkward, and may cause significant injustices.

estimates are that it costs up to \$40,000 per year to keep one prisoner in a maximum-security prison in the United States.

Turning to opportunity costs, inmates in U.S. prisons devote the bulk of their time to making highway signs, doing one another's laundry, preparing meals, and the like. More productive uses of their time surely could be found. One proposal, which former Chief Justice Warren Burger called "factories with fences," is to invite private industry to hire prisoners to produce marketable goods. At Attica State Prison in New York, a metal shop that manufactures file cabinets showed a profit of approximately \$1.3 million in 1984. In Minnesota, Stillwater Data Processing, Inc.—a private, nonprofit corporation—employs inmates of a maximum-security prison as computer programmers. In Illinois, medium-security prisons often produce and market such valuable commodities as high school and college marching band uniforms. In North Carolina, female prison inmates serve as the staff that answers the state's tourism telephone hotline. Inmates highly prize those jobs and compete for them in terms of good behavior. However, there are legal obstacles that limit these developments, such as a federal law that makes transport of prison-made goods in interstate commerce illegal, and the "state-use" statutes that forbid the sale of prison-made goods to the governments of most states. Several states, eager to take advantage of the "factories with fences" idea, have repealed their state-use statutes.

Is there a cheaper method of deterring criminals than incarceration? One candidate that we shall look at shortly is the use of fines. Another is the use of high-technology monitoring equipment to enforce restrictions on criminals who are not in prison. For example, the terms of probation may prohibit a criminal from leaving a certain city, and the criminal may be required to report to his probation officer each week. In 1994, 40,000 criminals in the United States were wearing ankle bracelets that cannot be removed by them and that emit a signal enabling the police to locate them. The daily cost to the authorities of the ankle bracelet is \$10, a fraction of the daily cost of imprisonment. Today those bracelets are equipped with GPS systems so that the exact location of the bracelet can be found at all times.

3. Sentencing Reform Two reforms in the sentencing of prisoners may have caused the sharp increase in the number of prisoners in the United States that we mentioned earlier. In 1980, most states followed a system called "indeterminate sentencing." Under indeterminate sentencing, the criminal statute prescribed an indefinite term for committing a particular offense, such as imprisonment "for not less than five years, nor more than ten years." The judge had discretion in determining the sentence within these broad boundaries. After the judge pronounced the sentence, the actual time served would be determined by the prison authorities and the parole board, depending on the prisoner's behavior and rehabilitative progress.⁴²

In the mid- and late 1980s state and federal authorities replaced this system of judicial discretion with a system of determinate or mandatory sentencing. Under this system, the criminal statute prescribes a specific sentence for a particular crime—say, 15 years in prison for committing crime X. The offender becomes eligible for parole only after having served some fixed amount of time prescribed in the statute. Sometimes the judge

⁴² The average violent offender in a state prison today spends only 40 percent of the sentence in prison.

reads the mandatory sentence from a grid. The vertical side of the grid lists crimes by their seriousness, ranging from a lesser felony to first-degree murder. Along the top of the grid, the history of the offender is scaled from 0 (a first-time offender) to 9 (a violent career criminal). Entries in the table increase in severity as one reads down or across. Judges have very little discretion to alter the sentence.⁴³

We mentioned that the total number of prisoners in the United States rose to about 2.4 million in 2008. The principal reason for this increase is the mandatory sentencing of drug offenders. Today, 60 percent of all inmates in federal prisons and 20 percent of all those in state prisons are there on drug charges. (Later we analyze drug crimes.)

In complying with the requirements of mandatory sentencing, states are running out of prison space and money. For example, Texas today has about 240,000 offenders in prison, at an annual cost of \$3 billion. In the early 1980s there were 188,000 prisoners, at an annual cost of \$600 million. Federal law prevents the states from packing more prisoners into the same prisons.⁴⁴ Congress has tried to help the states by providing them with prison space under certain conditions.⁴⁵

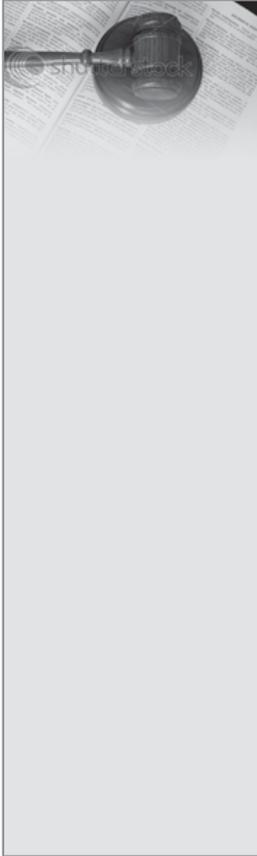
We have already considered (in the text box above) the workings and effects of three strikes laws. The economic wisdom of those laws is dubious. Imprisoning a 25-year-old for life would cost a phenomenally large sum of money, probably in excess of \$1,000,000. In addition, keeping older inmates in prison is very costly and does not provide much social benefit. A California study found that the annual medical costs for prison inmates 55 and older may be \$100,000. Moreover, only 2 percent of inmates over 55 who are released are ever rearrested.

In many states correctional spending has replaced health care spending as the fastest-growing component of the state budget. To reduce that correctional spending, many states are implementing criminal sentencing reforms. Michigan, for example, has recently abolished all of its mandatory minimum-sentencing drug laws. Louisiana eliminated some mandatory sentencing in favor of discretionary sentencing and amended its “three strikes” statute so as to count only violent felonies as the first two “strikes.” Mississippi abolished discretionary parole in 1995 and brought it back for nonviolent first-time offenders in 2005. Eighteen other states have passed similar reforms of their sentencing laws.

⁴³ For a critique of mandatory sentencing and an argument by a former state court trial judge in Pennsylvania that the prior system of judicial discretion worked well, see LOIS G. FORER, *A RAGE TO PUNISH: THE UNINTENDED CONSEQUENCES OF MANDATORY SENTENCING* (1994).

⁴⁴ In North Carolina, inmates sued the state, contending that crowded state prisons violate the Eighth Amendment of the U.S. Constitution, which forbids cruel and unusual punishment. The 1988 agreement settling the suit stipulated that North Carolina would provide 50 square feet of space for each prisoner. With its current facilities, North Carolina can only house 21,400 prisoners and still satisfy this agreement. To keep the total state prison population at 21,400, the average time served by prisoners in North Carolina over the past seven years has fallen from 40 percent of the original sentence to 18.5 percent.

⁴⁵ In its 1994 anticrime act, Congress appropriated money for the federal government to build ten “regional prisons,” designed to add 50,000 to 100,000 new prison spaces within the next five years. Congress invited the states to place their prisoners in these new facilities (thus, saving the states the politically painful cost of building their own new prisons), but only if the states would reform their criminal codes in several ways—most importantly by assuring the federal government that violent offenders would spend 85 percent of their sentence in prison.

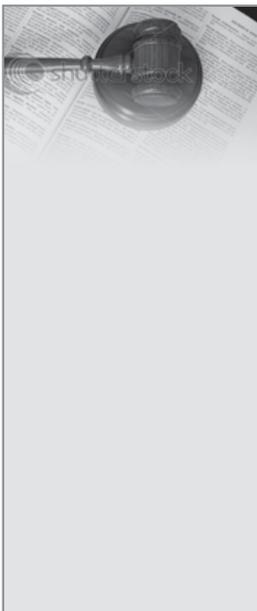


Prisons for Profit and Factories with Fences

The U.S. government buys fighter planes, banking services, and hospital care from private companies. Why not pay private companies to confine prisoners? The profit motive spurs cost-cutting, quality control, and technological innovation, which make private businesses more efficient than the state. To illustrate, the Corrections Corporation of America, Inc., constructed the detention center of the U.S. Immigration and Naturalization Service in Houston for one-half the cost and in one-third the time required for the construction by the government of a comparable facility. CCA contends that its costs are generally about 6 percent below those of similar facilities operated by governmental bodies. CCA now owns 40 correctional facilities and manages some portion of the prisons in almost all the states and more than a dozen municipalities.

Another private company, Behavioral Systems Southwest, incarcerates 600 to 700 prisoners per day in leased hotels and large houses for a state prison system. The company deals only with low-risk prisoners and manages to detain them in its leased facilities for about \$25 per day, compared with the \$75 to \$100 per-day cost of detention in a conventional facility.

Only a handful of privately operated prisons exist today in the United States, but penologists believe that the trend will broaden. The John Howard Association, a private, nonprofit group that lobbies for prisoners' rights, has not decided whether to support or oppose private prisons. The American Correctional Association is also adopting a wait-and-see attitude. However, the National Sheriffs Association and the American Federation of State, County and Municipal Employees, which represents 40,000 corrections employees, oppose privatization vigorously. (Can you see why?)



Prisons versus Social Programs

The prison population in the United States increased by almost a factor of five between 1980 and 2008—from 500,000 to almost 2.5 million people. As imprisonment became a much more likely punishment for conviction of a crime, the amount of many serious crimes fell dramatically. Prisons are expensive to build and expensive to operate. The best estimate we have is that the variable costs of incarceration are approximately \$50,000 per year per prisoner. Because this society has so rapidly increased the number of prisoners, it may well be the case that we have reached the area of diminishing marginal social returns to further imprisonment. That is, the marginal social cost of imprisoning a further 100 prisoners—roughly \$5 million—may be greater than its social benefits (in terms of crime deterred).

In an important recent study, John Donohue and Peter Siegelman calculated the marginal social return to further imprisonment and compared that return to that of spending an equal amount on social intervention programs designed to deter crime. Their conclusion was

(Continued)

that the social return on incarceration has fallen so that the elasticity of crime with respect to incarceration is approximately -0.15 .⁴⁶

That figure means that, for example, a 10 percent increase in spending on incarceration will cause a 1.5 percent drop in the amount of crime.

An economically informed policy that seeks to minimize the social costs of crime should take this elasticity and others into full consideration. For example, if we had evidence on the elasticity of crime with respect to spending on social programs and on policing and on other crime-detering policies, we should allocate resources across these crime-detering policies so as to get the greatest possible reduction in crime per dollar spent. There are estimates that suggest that the elasticity of crime with respect to expenditures on policing is 20 percent greater than that on incarceration, indicating that society should spend less on prisons and more on police. There are also estimates that the elasticity of crime with respect to expenditures on preschool programs is significantly higher than -0.15 , suggesting that society should also transfer resources from prisons to preschools.

B. Fines

Imprisoning more people for longer periods may not be the most efficient way to reduce crime. A leading alternative to imprisonment is fines. In the previous chapter we examined the theory of fines, so our focus here is on the benefits and problems of implementing a system of fines for deterring crime.

Table 13.2 compares the use of fines and incarceration in several Western nations. Note the much greater reliance in Western Europe on fines as a punishment for

TABLE 13.2
Comparative Punishment for Selected Traditional Crimes, 1977

Country/ Jurisdiction	Total of Selected Defendants	Percent of All Defendants (in percent)	Incarceration (in Percent)	Fine Only (in Percent)	All Other (in Percent)
England, Wales	293,580	69	14	56	30
Germany	191,329	77	10	77	13
Sweden	29,121	67	13	43	44
U.S. Federal District Courts	16,057	56	39	5	56
Washington, D.C., Superior Court, 1974	1,847	38	32	4	64

The table and accompanying textual information are from Robert Gillespie, *Sanctioning Traditional Crimes with Fines: A Comparative Analysis*, 5 INT. J. COMP. APPL. CRIM. JUST. 197 (1981).

⁴⁶ See John J. Donohue III & Peter Siegelman, *Allocating Resources Among Prisons and Social Programs in the Battle Against Crime*, 27 J. LEGAL STUD. 1 (1998).

crimes, and the greater reliance in the United States on incarceration. What explains this difference? One possible explanation is that the United States' criminal population differs in significant ways from the European criminal population. For instance, Americans may use a gun or other dangerous weapon more frequently, thus deserving a stronger punishment. A second possibility is that a higher percentage of the U.S. criminal population consists of repeat offenders, for whom imprisonment may be the preferred sanction, and European criminals may tend to be first-time offenders, for whom fines may be the preferred sanction. A third possibility is that European criminals are more responsive to the threat of punishment than are criminals in the United States. Thus, authorities in this country must use more severe penalties to achieve the same level of deterrence that less severe sanctions generate in Europe. Finally, the difference may be due to different philosophical and cultural traditions. Europeans exhibit a distrust of imprisonment⁴⁷ as a deterrent, and Americans exhibit a distrust of fines.⁴⁸

The typical fine in the United States is a fixed fine per offense, independent of the offender's wealth, with statutorily defined absolute maximums. By contrast, many European countries combine the use of the fixed-fine-per-offense system with an additional fine (called the "day fine" system) scaled according to the offender's income. Under this scheme, the prosecutor determines the defendant's recent daily income and recommends that the defendant be punished, if guilty, by being responsible for paying that daily income times a certain number of days. For a trivial crime, such as a traffic offense, the figure may be one day. For a serious crime, the number of days may rise to a maximum of 120.⁴⁹ Instead of paying the day fine all at once, the convicted person is allowed to spread the payments over a period of time. Spreading the payment overcomes the problem that fines can be large relative to income or wealth.

QUESTION 13.9: Competition among sellers improves the quality of goods for consumers. Could this mechanism work for the private supply of prisons?

QUESTION 13.10: How do full employment and high wages contribute to the power of fines as a deterrent?

⁴⁷ G. Mansell, *Comparative Correctional Systems: United States and Sweden*, 8 CRIM. L. BULL. 748 (1972).

⁴⁸ American Bar Association Project on Standards for Criminal Justice, STANDARDS RELATING TO SENTENCING ALTERNATIVES AND PROCEDURES (1971), and National Advisory Commission on Criminal Justice Standards and Goals, PROCEEDINGS OF THE NATIONAL CONFERENCE ON CRIMINAL JUSTICE (1973).

⁴⁹ For details on how the system works, see H. Thornstedt, *The Day-Fine System in Sweden*, 1975 CRIM. L. REV. 307. The reason that we may perceive criminal fines to be independent of the criminal's income and wealth is that we ignore the implicit economic effect of conviction on subsequent employment opportunities. John Lott, Jr., (in *Do We Punish High Income Criminals Too Heavily?* 30 ECON. INQ. 583 (1992)) shows that high-income criminals suffer a much larger loss in subsequent earnings due to a criminal conviction than do low- and medium-income criminals. Lott calculates that adding in this element of loss makes the total monetary penalty for crime (criminal fine plus the loss in subsequent earnings) steeply progressive.

IV. The Death Penalty

The ultimate punishment is death. In recent years, many countries have abandoned this sanction, and executions virtually ceased in the United States during the 1960s and have been very rare in the first decade of the twenty-first century. In 1972, the Supreme Court found the death penalty to be unconstitutional when applied “capriciously and discriminatorily.”⁵⁰ This court decision provoked hostility among voters in some states, and many legislators responded by introducing legislation to revive capital punishment. After 1972, state legislatures amended their death statutes to comply with the Supreme Court’s decision and to allow executions for the most serious crimes. In 1976 the Supreme Court upheld three revised state capital-punishment statutes as constitutional.⁵¹ Currently, 37 states and the federal government have capital punishment statutes; 12 states and the District of Columbia do not.⁵² Between 1976 and 2008, there were 1,224 executions of criminals in the United States, an average of approximately 37 people per year. There were 53 people executed in 2006, all of them men. The executions took place in 14 states—24 in Texas, 5 in Ohio, 4 in Florida, Oklahoma, North Carolina, and Virginia, and 1 each in Indiana, Alabama, Mississippi, South Carolina, Tennessee, California, Montana, and Nevada. All but one died by lethal injection. The number of prisoners on death row at the end of 2005 was 3,254. That is the fifth consecutive year that the number has fallen.⁵³ In 2008 there were 3,275 prisoners on death row. In 2009 there were 51 executions of prisoners; those occurred in 12 states. All but one of the executions in 2009 were by lethal injection; one was by electrocution. One prisoner died by firing squad in 2010, in Utah.

There have been, however, some interesting developments in the application of capital punishment in the United States. The peak year for executions since the reinstatement of the death penalty in 1976 was 1999, when there were 98 executions. Interestingly, only four states—Texas, California, Florida, and North Carolina—account for half of the additions to death row in recent years. And only two states—Oklahoma and Texas—account for half of the executions in recent years. Since 1999 the number of additions to death row in all the states has been decreasing. Indeed, in 2002 for the first time in a generation the number of prison inmates on death row dropped. These figures may indicate an important trend in American opinion. Although

⁵⁰ *Furman v. Georgia*, 408 U.S. 238 (1972). Justices Thurgood Marshall and William Brennan felt that the death penalty was cruel and unusual punishment (and, therefore, violated the Eighth Amendment to the Constitution) under any circumstances and, thus, would always be unconstitutional. (Justice Harry Blackmun announced in 1994, shortly before his retirement, that he, too, had come to believe that capital punishment was unconstitutional under any circumstances.) The other three justices of the majority were not prepared to go so far, holding instead that capital punishment was unconstitutional only when the state applied it capriciously and discriminatorily.

⁵¹ *Profitt v. Florida*, 428 U.S. 242 (1976); *Jurek v. Texas*, 428 U.S. 252 (1976); and *Gregg v. Georgia*, 428 U.S. 153 (1976).

⁵² Nebraska used to have the death penalty, but in 2008 the State Supreme Court declared the only method of execution (electrocution) to be unconstitutional. The state legislature has not written a new death statute.

⁵³ Forty-three percent of those on death row are African American. Approximately 1.5 percent are women. About 2 percent were 17 years old or younger.

public support for the death penalty is still strong (at 65 percent of those surveyed in 2006, down from 75 percent in the mid-1980s), it has been steadily declining for 20 years. And more than 50 percent of Americans believe that the death penalty is not administered fairly. Only 30 percent of Americans today believe that the death penalty deters homicide, down from 60 percent in 1985.

One reason for this declining support is the dramatic revelations in the mid- and late 1990s of the men on death row who were actually innocent. Since 1976 there have been a total of 304 condemned inmates who have been exonerated, mostly based on new evidence using new DNA techniques. In the late 1990s alone the State of Illinois released 13 people who had been wrongfully convicted of murders they did not commit and sentenced to death.⁵⁴ In early January 2003, outgoing Illinois Governor George Ryan pardoned an additional four Illinois inmates on death row whom he found to have been wrongfully convicted. On the last day of his administration Governor Ryan converted the death sentences of all 163 men and 4 women on Illinois' death row into life sentences.⁵⁵

The literature on the economics of capital punishment focuses on the empirical question of whether executions deter murders. The debate has centered on statistical issues, such as the specification of the model to be estimated or the adequacy of the data. In this section we review this literature and draw some tentative conclusions about the deterrent effect of capital punishment.



Web Note 13.4

The dramatic findings of the conviction of innocent people have caused several states, including Illinois, to rethink the procedures by which courts impose the death penalty. To learn more about the new procedures and find additional information and links to articles about wrongful convictions, see our website. See also SCOTT TUROW, *THE ULTIMATE PUNISHMENT: A LAWYER'S REFLECTIONS ON DEALING WITH THE DEATH PENALTY* (2003).

A. The Deterrent Effect of Capital Punishment

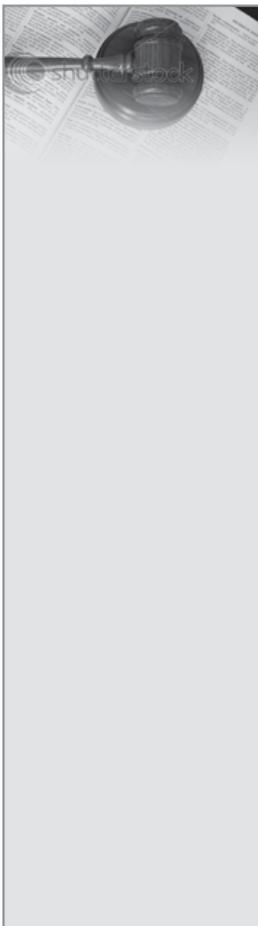
The sociologist Thorsten Sellin made the first major study of the deterrent effect of the death penalty.⁵⁶ Sellin used four tests to detect a deterrent effect. First, he compared the homicide rates for adjacent states that did and did not have the death penalty. He discerned no difference in homicide rates among these adjacent states and, therefore,

⁵⁴ These exonerations were the result of heroic work by journalism students at Northwestern University and the work of Larry Marshall and his coworkers at the Center on Wrongful Convictions at the Northwestern University School of Law.

⁵⁵ See Samuel R. Gross, Kristen Jacoby, Daniel J. Matheson, Nicholas Montgomery, & Sujata Patil, *Exonerations in the United States, 1989 Through 2003*, 95 J. CRIM. L. & CRIMINOLOGY. 523 (2005) and Andrew Gelman, James S. Liebman, Valerie West, & Alexander Kiss, *A Broken System: The Persistent Pattern of Reversals of Death Sentences in the United States*, 1 J. EMP. LEGAL STUD. 209 (2004).

⁵⁶ THORSTEN SELLIN, *CAPITAL PUNISHMENT* (1967), pp. 135–160. See also T. SELLIN, *THE PENALTY OF DEATH* (1980).

inferred that the death penalty had no deterrent effect. Second, Sellin compared homicide rates within the same state before and after the abolition or restoration of the death penalty. He found no significant difference in those rates depending on the legal status of the death penalty. Third, Sellin looked at homicide rates within cities where executions had taken place and had been well publicized. There was no difference in homicide rates just before and just after executions. Lastly, he examined death rates for police officers in states that did and did not have the death penalty for murdering a police officer. The rate at which officers were killed was the same, regardless of whether that state executed the murderers of police officers.⁵⁷ Sellin's overall conclusion from these four tests was that the death penalty does not deter homicides.



Probabilistic Punishments: Good Economics, Bad Law

Most people dislike taking chances with very large stakes, such as their lives. The classical Chinese legal system took advantage of this fact to deter criminals cheaply and effectively.⁵⁸ A large number of crimes were punishable by death in imperial China, in principle. In reality, few criminals from noble families were executed, but many were threatened with execution. Criminals convicted of capital offenses had to pass through a series of rituals that resulted in random executions. In the last ritual, the names of everyone convicted of a capital offense were written on a scroll that was presented to the Emperor annually. The Emperor took a red brush and stroked it across the scroll. Anyone whose name was touched by red ink, which was a fraction of the names on the scroll, was executed. Anyone passing safely through this ritual several times was set free. The main advantage of this system was that many people could be deterred from committing serious crimes without actually executing very many people, and without significant cost to the state. Risk is cheap, effective punishment.

Public opinion, however, has turned decisively against random punishments, as dramatically illustrated by an infamous New York case. After a criminal was convicted of a felony, the judge explained that he would flip a coin to determine whether the young man would be set free or sentenced to prison. These facts found their way into the newspapers, producing an uproar, and the judge was eventually removed from the bench for misconduct and barred from serving as a New York judge again.⁵⁹

QUESTION 13.11: What are the main sources of randomness in the contemporary criminal justice system?

QUESTION 13.12: Do you think that this randomness discourages or encourages crime?

⁵⁷ Some people assert that in the absence of the death penalty, hardened criminals have nothing to lose from killing prison guards or other inmates, and, therefore, will commit more of those murders.

⁵⁸ MARTIN SHAPIRO, *COURTS: A COMPARATIVE AND POLITICAL ANALYSIS*, pp. 157–193 (1981). See also NEIL DUXBURY, *RANDOM JUSTICE: ON LOTTERIES AND LEGAL DECISION-MAKING* (2002).

⁵⁹ W. G. Blair, “Flip of Coin Decides Jail Term in a Manhattan Criminal Case,” *The New York Times* (Feb. 2, 1982); K. R. Shipp, “Ex-Jurist Who Made Coin-Toss Decision Is Barred from Being New York Judge Again,” *The New York Times* (April 7, 1983).

The most famous study of the deterrent effect of capital punishment was by Isaac Ehrlich, an economist.⁶⁰ Ehrlich, following the Becker model that we explored in the previous chapter, assumed that the potential murderer balances the expected punishment against the expected benefit. Ehrlich allowed certain economic and social variables to measure the benefit of homicide to the killer. He included data on the unemployment rate, the labor-force participation rate, the level of wealth, the age composition of the population, and the racial composition of the population.⁶¹

Ehrlich took the criminal's expected costs of homicide to depend on three variables: the probability of being arrested for the crime (measured by the total number of arrests for homicide divided by the total number of reported homicides); the probability of being convicted of homicide (measured by the total number of convictions for homicide divided by the total number of arrests for homicide); and the probability of execution if convicted (measured by the total number of executions divided by the total number of convictions for homicide). Ehrlich predicted an inverse relationship between each of these three probabilities and homicide rates.

Using time-series data for the United States for the period 1933–1969, Ehrlich concluded that the homicide rate was negatively and significantly correlated with each of the three deterrence measures. Ehrlich's model also predicted that the strongest deterrent effect on homicides would arise from an increase in the probability of arrest; the next strongest, from an increase in the probability of conviction; and the next strongest, from an increase in the probability of execution. The data confirmed his predictions about the relative strength of each of these variables. The most dramatic of his conclusions was that one additional execution per year resulted in between seven and eight fewer homicides per year.⁶²

Critics found two statistical shortcomings in the Ehrlich study. First, in Ehrlich's model of behavior, homicide rates could be a linear function of the independent variables, a multiplicative function, a logarithmic function, or some other form. Ehrlich offered no persuasive reason for the particular functional form in which he estimated his regression; yet, changing the functional form changed his results.⁶³

Second, Ehrlich's results are much too sensitive to the time period over which the estimations were made. Recall that Ehrlich's original study covered the period

⁶⁰ Isaac Ehrlich, *The Deterrent Effect of Capital Punishment: A Question of Life and Death*, 65 AM. ECON. REV. 397 (1975). See also Ehrlich, *Capital Punishment and Deterrence: Some Further Thoughts and Additional Evidence*, 85 J. POL. ECON. 741 (1977).

⁶¹ He justified inclusion of the race variable on the ground that legitimate employment opportunities for blacks, especially for young male blacks, are limited. Thus, there may be a greater tendency for blacks to commit property crimes and, because of the correlation between those crimes and homicide, to commit murder.

⁶² The Department of Justice cited this particular result in its argument before the Supreme Court in *Gregg v. Georgia* in favor of the death penalty. Kenneth Wolpin did a study similar to Ehrlich's for England and Wales for the period 1929–1968 and concluded that an additional execution would have led to four fewer homicides. Wolpin, *Capital Punishment and Homicide: The English Experience*, 68 AM. ECON. REV. 422 (1978). An additional finding of the Ehrlich study—a finding frequently overlooked in the debate on the deterrent effect of capital punishment—is that the deterrent effect of an improvement in labor-market conditions is stronger than that of any of the criminal-justice-system variables.

⁶³ John Taylor, *Econometric Models of Criminal Behavior*, in *ECONOMIC MODELS OF CRIMINAL BEHAVIOR* (J. M. Heineke, ed. 1978).

1933–1969. In the last seven years of that period, the number of executions dropped precipitously, from 47 in 1962 to two in 1967 and to zero in 1968 and 1969. During those same seven years, crime rates escalated sharply. These facts commend excluding the period 1962–1969 from the data used in the regression. John Taylor and Peter Passell redid Ehrlich's study, excluding the period 1962–1969, and found that the statistical significance of the deterrent relationship between the number of executions and the number of homicides disappeared.⁶⁴

In addition to these statistical problems, the critics identified a subtle theoretical problem. Ehrlich found that the number of homicides was an inverse function of the probability of being convicted for murder, which implies that the greater the conviction rate for homicide, the lower the number of murders. Suppose that juries know that if they convict a defendant of homicide, the chances of execution are extremely high. They may be reluctant to convict for first-degree murder. If so, then the following paradoxical behavior may result: Greater use of execution as the punishment for certain homicides might lead to *fewer* convictions for murder. This would reduce the deterrent effect of both capital punishment and of convictions on subsequent murderers.

There is evidence that precisely this sort of relationship occurred in Great Britain. Before the abolition of the death penalty in 1965, British judges had less discretion to avoid sentencing defendants guilty of first-degree homicide to execution than did juries and judges in the United States. Offenders who were found insane could not be executed. Before 1965 the percentage of murderers in Great Britain who were found to be insane was much larger than it was in the United States. Not surprisingly, the number of murderers in Great Britain found to be insane fell dramatically after 1965 when the death penalty was abolished. There was no sudden and dramatic improvement in the mental health of the British criminal class. Rather, British judges before 1965 were reluctant to sentence convicted murderers to death.

Professor Richard Lempert, using this insight into the connection between conviction and the reluctance to execute, reestimated Ehrlich's model and found that an increase in the use of the death penalty would have lowered the probability of a murderer's being convicted by 17 percent.⁶⁵

After a lull in studies of the deterrent effect of capital punishment in the mid- and late 1980s and much of the 1990s, there has been a spate of new studies in the early part of this century. Why? Partly because there has been a wealth of additional experience and, therefore, data with which to perform econometric tests. Partly, too, because of the

⁶⁴ Passell & Taylor, *The Deterrent Effect of Capital Punishment: Another View*, 57 AM. ECON. REV. 445 (1977). In response to these criticisms, Ehrlich did a cross-sectional study of the deterrent effect of capital punishment on homicide for various states between 1940 and 1960. Ehrlich, *Capital Punishment and Deterrence: Some Further Thoughts and Additional Evidence*, 85 J. POL. ECON. 741 (1977). Again Ehrlich found a deterrent effect on homicide from increases in the probability of execution. This later study is not subject to the same criticisms that were made of the earlier work, but other objections have been raised to Ehrlich's use of cross-sectional data.

⁶⁵ Richard Lempert, *Desert and Deterrence: An Assessment of the Moral Bases of the Case for Capital Punishment*, 79 MICH. L. REV. 1177 (1981). Wolpin's work, mentioned above, also noted that, in order for his conclusions about the deterrent effect of the death penalty in England to hold, a change in the probability of execution of convicted murderers must not cause a change in the probability of conviction for murder.

very different experiences of the various states with the death penalty over the last 20 or so years—differences noted earlier in this chapter. For example, some of the states, such as Illinois, have had moratoria on executions, which could, in theory, lead to an increase in homicides if there is, in fact, a deterrent effect of capital punishment. Yet another reason for the new studies is the development of new, more powerful empirical techniques.

Some of the new studies have found a significant effect while others have found no significant deterrent effect of capital punishment. For instance, Lawrence Katz, Steven D. Levitt, and Ellen Shustorovich found no evidence of a deterrence effect of capital punishment. Indeed, they expect that none is likely to be found for the simple reason that there is very little fluctuation in the annual number of executions while the annual number of homicides varies widely.⁶⁶ By contrast, Dezhbakhsh and Shepherd, in an analysis of time-series data from 1960 to 2000, found a statistically significant negative causal relationship between capital punishment and the homicide rate. Indeed, the deterrent effect they found was very large—150 fewer homicides as a result of each execution.⁶⁷ Earlier, using a different data set, Dezhbakhsh, Rubin, and Shepherd also discovered a deterrent effect, with each execution deterring 18 subsequent homicides.⁶⁸ Finally, Mocan and Gittings, using monthly, county-level panel data spanning the period 1977–1997, found that taking commutations, executions, and crime rates into account, each execution deterred five subsequent homicides and each commutation caused five subsequent homicides.⁶⁹

These new studies prompted John Donohue and Justin Wolfers to do a comprehensive survey of the new literature on the deterrent effect of the death penalty.⁷⁰ They draw attention to two pieces of anecdotal but telling evidence suggesting that there is no causal relationship between executions and the homicide rate. The first has to do with a comparison of the Canadian and United States homicide rates. The Canadian rate is about one-third that of the United States but it has fluctuated up and down over the last 50 years in uncanny imitation of the fluctuations in the U.S. homicide rate. And yet Canada has had no executions since 1962.

The second has to do with a comparison of homicide rates in those states that have the death penalty and those that do not. “There are six states that have not had the death penalty on the books at any point in our 1960 to 2000 sample. . . . Again the most striking finding is that the close co-movement of homicide rates in these two groups of states.”⁷¹

⁶⁶ Lawrence Katz, Steven Levitt, & Ellen Shustorovich, *Prison Conditions, Deterrence, and Capital Punishment*, 5 AM. LAW & ECON. REV. 213 (2003).

⁶⁷ Hashem Dezhbakhsh & Joanna M. Shepherd, *The Deterrent Effect of Capital Punishment: Evidence from a Judicial Experiment*, 44 ECON. INQ. 512 (2006).

⁶⁸ Hashem Dezhbakhsh, Paul H. Rubin, & Joanna M. Shepherd, *Does Capital Punishment Have a Deterrent Effect?: New Evidence from Postmoratorium Panel Data*, 5 AM. LAW & ECON. REV. 344 (2003).

⁶⁹ H. Naci Mocan & R. Kaj Gittings, *Getting Off Death Row: Commuted Sentences and the Deterrent Effect of Capital Punishment*, 46 J. LAW & ECON. 453 (2003).

⁷⁰ John J. Donohue III & Justin Wolfers, *Uses and Abuses of Empirical Evidence in the Death Penalty Debate*, 58 STAN. L. REV. 791 (2005).

⁷¹ *Id.* at 800-01. Donohue and Wolfers refer to these events as “Supreme Court-mandated natural experiments.”

Donohue and Wolfers conclude that the new studies do not make a compelling case for the deterrent effect of the death penalty.

B. The Social Costs of Capital Punishment

Although the deterrent effect of capital punishment—the social benefit of the death penalty—remains an open question, the high administrative *costs* of capital punishment are not in doubt. Jury selection is more painstaking, because state statutes usually allow both the prosecution and the defense to challenge more jurors. A recent study of California capital cases found that jury selection in capital cases averaged 13 days, while jury selection in noncapital cases averaged three days.

Once the jury is selected, the trial itself is much more expensive in a capital case than in a noncapital case. Both the prosecution and the defense put on more complicated and thorough cases. One recent estimate suggests that a capital case costs the prosecution an average of \$2 million. Moreover, the capital trial is typically divided into two trials: one to determine guilt, the other to assess the penalty. The safeguards that have been put in place in the penalty phase of the trial are so elaborate that it is not unusual for that phase to be nearly as long as the trial on the determination of guilt.

Finally, the post-conviction legal proceedings in death cases have become elaborate and expensive. Most states require automatic review of all capital cases by the state's highest court. Not only is this review directly expensive to the prosecution and the defense, it also diverts the scarce judicial resources of the state court of last resort from other pressing business. And, of course, the recent discoveries of wrongful convictions in capital cases have made both trials and post-conviction appeals more expensive (no doubt, correctly so) than ever.

Even excluding the appeals process, the costs of the death penalty to the state are high. Imprisonment on death row is twice as expensive as imprisonment among the normal prison population. Death-row inmates require more elaborate security and supervision. They cannot be employed in the usual prison enterprises, and consequently, they make little contribution to the revenues of the prison. Because of extreme stress, the inmates' medical and psychiatric costs are high on death row.

C. Conclusion on Deterrence and Capital Punishment

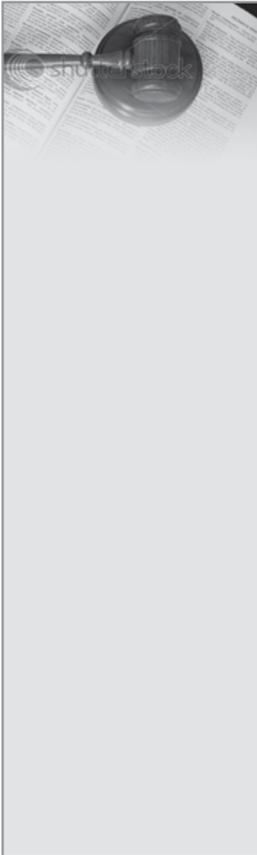
The statistical evidence does not support the firm conviction that executions deter homicides. Perhaps we will not ever obtain compelling statistical conclusions.⁷² Separating the effect of executions from other variables requires good data on a large number of cases, data that may be very difficult to collect. Moreover, states restrict executions to such a small group of killers that statisticians have little data to analyze. And finally, the recent discovery of the large number of cases

⁷² See Edward Leamer, *Let's Take the "Con" Out of Econometrics*, 73 AM. ECON. REV. 31 (1983). Professor Leamer uses an econometric study of the deterrent effect of capital punishment to demonstrate the impact of the investigator's prior beliefs on his conclusions. *Id.* pp. 40–43.

in which the death penalty was wrongfully imposed on innocent men has been extremely disturbing.

QUESTION 13.13: Opponents and proponents of capital punishment deny that their beliefs depend on the presence or absence of deterrence effects,⁷³ yet Ehrlich's study provoked intense debate and outrage. What do these facts say about the contribution of econometrics to criminal law?

QUESTION 13.14: In the eighteenth century, prisoners were not only executed, they were also whipped, branded, and mutilated. Can you think of any economic reasons why many modern states have eliminated these punishments, retaining only fines, imprisonment, and probation?



Racial Discrimination and the Death Penalty

Does the defendant's race significantly influence the probability of capital punishment? A study by Wolfgang and Amsterdam of 3000 rape convictions in 11 southern states between 1945 and 1965 showed that the execution of African Americans convicted of rape was relatively rare (13 percent). However, the study found that blacks were seven times more likely to be executed than whites convicted of the same crime, and a black man who had raped a white woman was 18 times more likely to be executed than when the victim and injurer were any other combination of race. These facts are consistent with the traditional hostility of some southern whites to sexual relations between black men and white women. A similar comparison of black and white executions for the same crimes in the North yielded much less evidence of race differences.

A different conclusion was reached for murder. For the period 1930–1967, the murder of a black person by another black person was slightly less likely to result in the murderer's execution than the murder of a white person by another white person. For the period 1967–1978, the statistics showed clearly that blacks were less likely to be sentenced to death for murder than were whites.

Behind such statistics lies a simple fact: The overrepresentation of blacks among criminals who commit capital crimes guarantees that capital punishment will result in the execution of blacks in greater proportion than their numbers in the general population. This fact alone will open capital punishment to the charge of racism in future political debates.⁷⁴ Nonetheless, the proportion of blacks sentenced to death raises worrisome concerns of implicit or explicit racial bias.

⁷³ For example, 90 percent of those in favor say that they are in favor of that sanction even if it could be shown to them conclusively that there is no deterrent effect. Vidmar & Ellsworth, *Public Opinion and the Death Penalty*, 26 STAN. L. REV. 1245 (1974).

⁷⁴ See Stanley Rothman & Stephen Powers, *Execution by Quota?*, 116 PUB. INTEREST 3 (1994). See also JOHN BLUME, THEODORE EISENBERG, & MARTIN T. WELLS, *Explaining Death Row's Population and Racial Composition*, 1 J. EMP LEGAL STUD. 165 (2004).

V. The Economics of Addictive Drugs and Crime

One of the popular explanations for increased crime is increased drug abuse. The use of such addictive drugs as heroin, crack cocaine, and PCP contributes to crime in three ways. First, some drug addicts need to commit crimes to generate incomes. Their habit is so debilitating that they cannot work at legitimate jobs, or they cannot earn enough working at legitimate jobs to pay for drugs. Second, drugs, like alcohol, may cause people to commit crimes by undermining their inhibitions and increasing the volatility of their moods. About 70 percent of those arrested in all large U.S. cities for robbery, weapons offenses, and larceny test positive for heroin, cocaine, or PCP. Third, drug dealing can be a lucrative business, and, therefore, a business worth protecting against competition. Drug dealers commit violent crimes against their competitors. Drug use contributes significantly to crime, so reducing the social costs of crime involves reducing the use of addictive drugs. We have already seen that a very high percentage of the almost 2.5 million persons in U.S. jails and prisons are there for drug offenses.

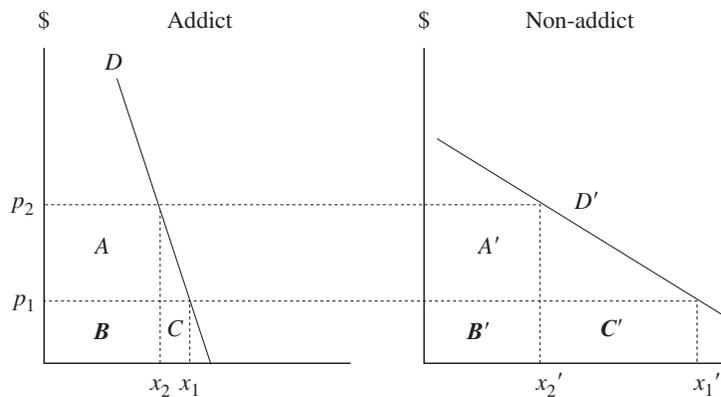
A. Punishing Drug Sales

Current policy in the United States seeks to break the connection between the use of addictive drugs and crime by curtailing the supply of drugs and by reducing the demand for them. One means of reducing the supply and lessening the use of illegal drugs is to increase the expected punishment for selling or using them. Some suppliers will leave the business of supplying drugs in favor of legitimate, less risky activities. At the same time, the higher market price caused by the restriction in supply may cause consumers to purchase fewer drugs.

Some economists have argued that this policy is incorrect because its factual premises are incorrect. Critics argue that addiction makes the demand for the drugs inelastic. Therefore, a restriction in supply and the resulting increase in the market price of the illegal drug will not cause the addict to reduce his consumption significantly. Instead, it will cause him to increase the amount of crime he commits to produce the greater revenue required to support his habit.

Figure 13.1 depicts this argument. The figure is divided into two panels representing two kinds of drug users. The left panel indicates demand for drugs by addicts, denoted D . The right panel indicates demand for drugs by nonaddicts, denoted D' . By “nonaddicts” we mean occasional users who are not physically dependent on drugs. Figure 13.1 shows the consequences of a successful campaign to interdict drugs and punish the suppliers and

FIGURE 13.1
Drug markets and price.



users. Before the campaign, the price of drugs is p_1 , which results in drug use by addicts and nonaddicts denoted x_1 and x'_1 , respectively. After the campaign against drugs, the price rises to p_2 . The price includes the purchase price and also the monetary equivalent of the risk of punishment caused by purchasing illegal drugs. At price p_2 , addicts use drugs in the amount x_2 . The fact that x_2 is *not* much less than x_1 indicates that demand by addicts is inelastic. At price p_2 , nonaddicts use drugs in the amount x'_2 . The fact that x'_2 is *much* less than x'_1 indicates that demand by nonaddicts is elastic. Raising the price of drugs from p_1 to p_2 has little effect on drug use by addicts and a large effect on nonaddicts.

Now consider the effects of the increase in price on expenditures on drugs. Addicts purchase x_1 drugs at the low price p_1 , which results in total expenditures of $p_1 \times x_1$, as indicated by areas $B + C$ in Figure 13.1. After the campaign against drugs, addicts purchase x_2 drugs at the higher price p_2 , which results in total expenditures of $p_2 \times x_2$ as indicated by the areas $A + B$ in Figure 13.1. The campaign thus causes a large increase in expenditures on drugs by addicts, specifically an increase of $A - C$. Total expenditures go up because addicts continue buying almost the same quantity of drugs and paying a much higher price. Consequently, addicts will need a lot more money to buy drugs, and much of that money may come from property crimes. Thus, public policies that raise the cost of drugs to addicts may cause more crime rather than less. (The campaign against drugs, which raises prices, also causes total expenditures by nonaddicts to go *down* by $A' - C'$.)

This analysis exposes a dilemma: Public policies that raise the price of drugs have the good effect of reducing their use by nonaddicts. Less use by nonaddicts presumably implies fewer crimes committed by them, and also fewer nonaddicts becoming addicts. However, public policies that raise the price of drugs have the bad effect of substantially increasing expenditures on drugs by addicts. More expenditure on drugs by addicts implies more crimes committed by them in order to get more money for drugs.

The obvious response to these facts is to try to get the best of both worlds by raising the price to nonaddicts and not raising the price to addicts. In other words, the obvious response is a drug policy that discriminates in drug prices between addicts and nonaddicts. Successful price discrimination causes the addicts in Figure 13.1 to face the low price p_1 and the nonaddicts to face the high price p_2 . As implemented in the United Kingdom and elsewhere, addicts can submit to medical examination and register their addictions. After registration, they can buy cheap drugs legally by prescription, much as people obtain medicinal drugs by prescription from a doctor. Consequently, addicts obtain a safe supply of drugs sufficient to maintain their habits. However, nonaddicts (or unregistered addicts) cannot obtain drugs legally from pharmacies; instead they must purchase drugs illegally at much higher prices.

We have discussed a system of prescription sales for addictive drugs that creates price discrimination between addicts and nonaddicts. Note that price discrimination in this system goes in the opposite direction from price discrimination practiced by profit-maximizing companies. The prescriptions system aims to lower the price of addictive drugs to consumers with inelastic demand (addicts), whereas profit-maximizing companies aim to raise the price of their products to consumers with inelastic demand.

The preceding analysis simplifies reality by sharply distinguishing between addicts and nonaddicts. Reality is more continuous than the sharp distinction in language suggests. The important point of the analysis is to lower the price for drug users with inelastic demand in order to reduce the harm that they cause. Thus, a recent Swiss experiment supplied free heroin to addicts who massively increased their daily doses;

yet, they significantly increased their participation in legitimate work and significantly reduced their income-generating criminal behaviors.⁷⁵

B. Suppressing and Interdicting

In the preceding section, we criticized policies attempting to increase the expected punishment of the sellers of illegal drugs. Now we consider the failure of policies aimed at suppressing drug production and interdicting the importation of drugs.

First, consider attempts to limit the production of illegal drugs abroad. In the 1970s the U.S. government tried to eradicate opium production in Turkey, then the source of most of the raw opium that ultimately became heroin for the U.S. market. The program was moderately successful in Turkey, but Mexico began to grow opium and quickly became the supplier of 80 percent of the U.S. market. The U.S. government next began an eradication program in Mexico, but production simply moved elsewhere. The odds against the success of these programs are overwhelming. U.S. citizens demand approximately six tons of heroin per year. To make that much heroin requires about sixty tons of opium, which equals 2 to 3 percent of the total illicit production of opium in the world each year. The world market for opium and heroin is too large, and production is too flexible, for the United States to suppress.

Similarly, the attempt to restrict the import of illegal drugs has failed.⁷⁶ Small amounts of illegal drugs are so valuable that tens of thousands of dollars worth can be easily concealed in personal luggage on commercial airlines. The authorities cannot effectively monitor the millions of individuals who arrive in this country on commercial airlines. When one route is blocked, suppliers easily shift to alternative routes. Also, drug suppliers smuggle by boat into remote harbors or by airplane onto private rural airstrips. A recent survey article concludes, “It is difficult to imagine a more aggressive supply reduction effort than the one we’ve experienced, and yet student surveys show that drugs remain readily available at schools, and cocaine and heroin prices have fallen to about a third of their 1981 levels after controlling for inflation.”⁷⁷

C. Legalization

These dubious policies against drugs are very expensive. During the 1980s federal expenditures on drug enforcement tripled, from about \$1 billion per year to more than \$3 billion per year and then rose in the early 1990s to \$6.7 billion per year. Although this figure is difficult to define precisely, the best available evidence (that of Jeffrey A. Miron and Katherine Waldock, *The Budgetary Impact of Ending Drug Prohibition* (2010)) is that by 2010 all levels of government in the United States were spending more than \$41 billion per year to eradicate illegal drugs. Miron and Waldock further estimate that legalizing currently

⁷⁵ For references, see Robert MacCoun, *Is the Addiction Concept Useful for Drug Policy?*, in NICK HEATHER & RUDY E. VUCHINICH, EDs., *CHOICE, BEHAVIORAL ECONOMICS, AND ADDICTION* (2003), 355–373, at page 368. Here’s a relevant joke: When Keith Richards, a member of the rock band “The Rolling Stones,” was arrested on another drug charge, he allegedly said, “Let’s get things straight. I don’t have a drug problem. I have a police problem.”

⁷⁶ See Peter Reuter, *Can the Borders Be Sealed?*, 82 *PUB. INTEREST* 36 (1988). See also Jonathan P. Caulkins, Peter Reuter, Martin Y. Iguchi, & James Chiesa, *How Goes the ‘War on Drugs’?*, RAND, DRUG POLICY RESEARCH CENTER, 2005.

⁷⁷ See generally MacCoun, *supra* n. 75.

illegal drugs would increase tax revenues for all levels of U.S. government by almost \$47 billion per year. So, the total costs to U.S. society of our current regime of recreational drug suppression is approximately \$88 billion per year—in direct expenditures of \$41 billion in suppression and enforcement and an opportunity cost of forgone tax revenues of \$47 billion.

While there is a strong economic case for decriminalizing drugs, there is a wide spectrum of legalization policies from which to choose. At one end is legalization with almost no governmental control. At the other end is total government control over the production and sale of drugs. In between is regulation with many possibilities—such as licensing of production and consumption; prohibition of sale to minors; regulations on the time, manner, and place of consumption and sale; more extensive programs to help addicts; and increasing education on the dangers of drug abuse.⁷⁸

A comparison of drugs and alcohol suggests an alternative to the current failed policies. In the United States, alcohol is the direct cause of 80,000 to 100,000 deaths per year and a contributing factor in another 100,000 deaths. More than one-third of all serious crimes resulting in state prison sentences involve the abuse of alcohol. There are in the United States an estimated 20 million alcoholics or alcohol abusers. The annual social cost of alcohol abuse to the United States is estimated to be over \$100 billion per year. Tobacco has similar social costs. Approximately 320,000 people die each year from consuming tobacco. By comparison, in 1985 only 3562 people died from the use of all illegal drugs. All of the social costs of illegal drugs are only a fraction of the social costs imposed by alcohol and tobacco.

In spite of the harm caused by alcohol, the American experiment with criminalizing its use in the 1920s failed. To illustrate, during the era of “prohibition” the murder rate soared to levels similar to those among drug dealers in the late 1980s. Then the murder rate plummeted when alcohol was decriminalized and regulated by the state, largely because the “alcohol wars” ceased. While alcohol causes crime, it seems that its prohibition caused even more crime.

Perhaps the same is true of drugs today. The murder rate might be even lower today if drugs were decriminalized and regulated by the state, bringing an end to the “drug wars.” Repealing many of the current laws might lead to a moderate increase in drug abuse, but moderately more abuse in an environment of drug regulation is probably preferable to the current level of abuse in a criminal environment.⁷⁹

In a recent study, Gary Becker, Kevin Murphy, and Michael Grossman explored some of the economic consequence of legalizing drugs.⁸⁰ They conclude that “a monetary tax

⁷⁸ For an illuminating discussion of the many varieties of legalization, see Mark Kleiman & Aaron Sager, *Drug Legalization: The Importance of Asking the Right Question*, 18 HOFSTRA L. REV. 527 (1990).

⁷⁹ For an argument that decriminalization would not lead to increased drug addiction, see Ethan Nadelman, *The Case for Legalization*, 82 PUB. INTEREST 3 (1988). For a more recent argument in favor of decriminalization, see ANDREW D. LEIPOLD, *The War on Drugs and the Puzzle of Deterrence*, 6 J. GENDER, RACE, JUST. 111 (2002).

⁸⁰ Becker, Murphy, & Grossman, *The Economic Theory of Illegal Goods: The Case of Drugs*, 114 J. POL. ECON. 38 (2006). Their investigation includes a broader consideration of *all* illegal goods, those for which “the social value [] is less than its private value.” Their general conclusion is that in instances of goods with that characteristic, “it would be most effective to allow the good to be legal, and impose the right monetary tax to account for the discrepancy between private and social values.” If that is the optimal policy, why has it been the case throughout history that societies have dealt with such illegal goods as prostitution, drugs, and gambling through suboptimal policies, such as bans? The authors suggest that “one answer to this discrepancy between actual and optimal policies depends on their different impacts on the consumption of middle class and poorer persons. Higher- and middle-level income families often prefer certain goods to be illegal rather than to endure higher taxes, while poor persons prefer the opposite. If the poor have much *less* political power, these goods would end up being illegal.”

on a legal good could cause a greater reduction in output and increase in price than would optimal enforcement, even recognizing that producers may want to go underground to try to avoid a monetary tax.”

In 1971 President Richard Nixon declared war on drugs. Judging from statistics on drug use and violence, we mostly lost this war. We cannot admit defeat, change tactics, and disengage because that would appear as if we are approving of drugs, rather like admitting defeat, disengaging, and withdrawing from Vietnam appeared as if we were approving of communism. Symbols can impede rationality. A rational approach to drugs would be to minimize the waste from addiction, crime, and imprisonment. Incarcerating vast numbers of young men (disproportionately African Americans) maximizes the waste. Instead, we should decriminalize, regulate, and tax, using tax revenues to finance advertising against drug use among youth.

QUESTION 13.15: During the “war on drugs” in the United States, the street price of most illegal drugs has remained stable or has fallen. What does this fact indicate about who is winning the “war”?

QUESTION 13.16: Use economics to compare three ways to reduce the *demand* for heroin: (i) the substitution of another, less dangerous, and less debilitating drug, such as methadone for heroin, to registered addicts; (ii) the free availability of the illegal substance to registered addicts; and (iii) a legal proscription on use, which is the current policy.

QUESTION 13.17: If violent criminals were tested immediately after arrest, do you think that more of them would test positive for the recent consumption of drugs or a hamburger? What, then, is the significance of the high rate of drug use among criminals?

VI. The Economics of Handgun Control

The United States has long had higher rates of violent crime than Western European nations. The United States also has higher rates of gun ownership, especially handguns, than most (but not all) European nations. In this section we explore whether widespread gun ownership causes crime, or whether crime causes widespread gun ownership. Criminals obtain guns to make crime easier and apprehension more difficult; so, guns tend to create crime. The potential victims of crime obtain guns to make their victimization harder and more risky for criminals; so, guns tend to reduce crime. We consider evidence on the relative strength of these two effects.

A. U.S. Gun Data

The correlation between the number of guns and the amount of crime is high. There are an estimated 200 million firearms in private possession in the United States, of which approximately 67 million are handguns. Approximately one-half of U.S.

households contain guns; the average number of guns per household is 4.5. There is an estimate that 100,000 schoolchildren take handguns to school each day.⁸¹ Recall the horrifying episode in April, 1999, at Columbine High School near Denver, Colorado, in which two heavily armed young men shot and killed a number of their fellow students and their teachers before committing suicide.

Gun ownership and crime in the United States have changed in an interesting pattern for the past 50 years, which may or may not be causally related. During the 1960s and the 1970s the robbery rate in the United States increased sixfold, and the homicide rate doubled. The rate of handgun ownership almost doubled, too. There are approximately 640,000 crimes committed with handguns every year in the United States, but that figure has varied considerably since the mid-1980s. Generally, the trend in the number of handgun-related crimes has been down. There were about 11,000 homicides committed in the United States in 1992 with handguns. (For the sake of comparison, in the same year there were 87 murders by handgun in Japan, 22 in Great Britain, and 10 in Australia.) Since 1989, there has been a slow but unsteady increase in the number of handguns in private hands in the U.S., including a significant surge in sales in late 2008 and early 2009. Since 1989, there has been a relatively steady or even declining number of homicides committed by handguns, so that by 2008 approximately 10,000 of the 16,000 homicides were committed by handguns. On a per capita basis, the homicide rate has been falling since the early 1990s. Are these correlations causal or coincidental? Does the increased number of firearms cause more crime or less crime?

B. Gun Control

The effort to break the connection between handguns and crime has focused on two general methods of regulation: first, restrictions on the production and possession of handguns; and second, more severe punishment for those who use handguns in the commission of crimes.⁸²

Since late in the nineteenth century, when governments passed the first laws regulating guns (specifically, concealed weapons), the first method of regulation has been the one most used by federal, state, and local governments. For example, in the 1930s Congress prohibited the use of the U.S. mail system for the sale of handguns across state lines; required the registration of machine guns, sawed-off shotguns, and silencers (weapons and equipment favored, at that time, by criminals), and the photographing and fingerprinting of registered owners of these weapons; and instituted a \$200 tax to be paid whenever the ownership of these registered weapons was transferred.

The latest federal attempt at limiting the possession of handguns is the Brady Act (passed by Congress in late 1993 and named after James Brady, President Reagan's press secretary, who was shot in 1981 during an assassination attempt on the president).

⁸¹ See Wilson, *supra* n. 7.

⁸² About 80 percent of U.S. citizens (including about 60 percent of the membership of the National Rifle Association, typically thought to be the principal lobby against handgun regulations) favor more restrictions on the possession of firearms, especially handguns. Only 30 percent support a complete ban.

The act requires gun buyers to wait five business days and undergo a background check before taking possession of the guns they have purchased. Because good recordkeeping is vital to this act's success and because most states do not have good records, the act authorizes the federal government to spend up to \$200 million per year to help states improve their recordkeeping. The goal is to replace the five-day waiting period with instant background checks within five years.⁸³

Regulations like the Brady Act may prevent those people most likely to commit a crime from obtaining handguns legally. More than 20 states, containing half the population of the United States, already have similar waiting periods. The experience in those states is that 1 to 2 percent of prospective gun buyers are disqualified by the background check. For instance, California's background-check law has prevented about 12,000 people with a criminal record or a history of mental illness or drug abuse from buying handguns in a recent two-year period. A similar law in Illinois has prevented 2,000 people from buying handguns there. We have no evidence on how many of these people subsequently purchased handguns illegally.

At the local level, regulations have taken a different tack. It has been illegal to sell handguns in Chicago since April, 1982.⁸⁴ Recently, some local governments have offered to purchase guns from their residents, no questions asked. In 1992, St. Louis offered to pay \$25 for each handgun turned in. The city collected 7,465 guns in the course of one month and melted them. Many public schools in large cities have metal detectors; the Clinton administration proposed random sweeps of housing projects to search for guns; and some localities have instituted random roadblocks to check cars for guns.

Besides these restrictions on production and possession, the punishment for violating handgun-possession regulations or for committing a crime with a handgun has increased. Several states have passed legislation that requires more severe and more certain punishment for those who carry a handgun without a permit. For example, the Massachusetts Bartley-Fox law in 1974 imposed a mandatory penalty of one year in prison without the possibility of probation, parole, or other diminution of sentence for failure to license a private handgun. Several studies have been conducted to measure the impact of Bartley-Fox, and the reported evidence suggests that the result of the law was, first, a reduction in the casual carrying of handguns, and, second, a decline in the proportion of assaults, robberies, and homicides committed with handguns.⁸⁵

⁸³ The purpose of these checks is to keep handguns out of the hands of convicted felons, fugitives, minors, current and former drug addicts, and those who have been involuntarily committed for mental illness. The Act has, arguably, been effective. From 1994 to 2008 there were nearly two million firearms' purchases that were prevented by Brady background checks. Prosecutions of illegal sales or purchases, however, have been very rare.

⁸⁴ Rifles, shotguns, and ammunition are available to those who have an Illinois Firearm Owner's Identification card. This FOID takes up to 1 month to get, and even if a potential gun buyer has one, he or she must go through a waiting period before receiving the gun. Notwithstanding these efforts, there are hundreds of thousands of illegal handguns in Chicago. The reason is that it is extremely difficult for Chicago to seal its borders. Handguns come from the suburbs, where they are not as tightly regulated, or from the neighboring states of Indiana or Wisconsin. This experience suggests that local regulation is likely to be ineffective.

⁸⁵ See WILSON, *THINKING ABOUT CRIME*, pp. 135–136 (rev. ed. 1983). This reduction in homicides associated with other felonies occurred even though the total number of these offenses was going up in Boston and in other large cities.

Notwithstanding this evidence, the two types of regulation noted do not appear to have had a large effect on crime rates. There are reasons for doubting the major premise of those regulations—namely, that more handguns inevitably lead to more violent crime. If criminals know that honest citizens are less likely to have guns, they may perceive smaller risk from committing crime and may, therefore, commit more crime. But if criminals know that many private citizens have guns, they might be increasingly wary of committing crime. This observation muddies the direction of causation between handguns and crime. The standard argument is that more handguns cause more crime. But perhaps more handguns lead to less crime. If so, then reducing the number of handguns may lead to an increase in the amount of crime.⁸⁶

Both casual and some detailed evidence⁸⁷ suggest that increases in handgun ownership have no simple causal connection to violent crime. The casual evidence notes that during the 1980s, the stock of privately owned handguns in the United States increased by more than a million units each year and that many crime rates fell. We have already seen a heightening of this pattern—increased private gun ownership and falling crime rates, including violent crime rates—during the 1990s. Additionally, a few countries, such as Switzerland and Israel, have a very high number of firearms per civilian household but do not have as much crime. Conversely, Mexico and South Africa have very strict handgun control laws, and these countries have murder rates more than twice as high as those in the United States. Florida's murder rate has been falling since the state made it easier for citizens to carry concealed weapons. (See Web Note 13.5 at the end of this section.)

Yet another fascinating piece of evidence on this matter is the correlation between private handgun ownership and “hot” burglaries. (A “hot” burglary is one in which there are people at home when the burglary occurs.) If homeowners can legally own handguns, then potential burglars will be less likely, all other things being equal, to invade houses in which someone is at home. However, if homeowners cannot legally own handguns, then burglars will not be as reluctant to invade when someone is at home. Thus, one ought to observe fewer “hot” burglaries in jurisdictions that allow homeowners to keep handguns. And, indeed, that is what one finds. The United States, Canada, and Great Britain have roughly equal burglary rates. However, the “hot” burglary rate in the United States (where private handgun ownership is generally allowed) is about 10 percent, and that in Canada and Great Britain (where private handgun ownership generally is not allowed) is about 50 percent.⁸⁸

This issue, like many of the other issues we have studied in the economics of crime and punishment, is complex. Better empirical work is needed before we can reach firm conclusions on the relationship between handguns and crime that could point to definite policy recommendations. The issue is not so much a free market in guns versus banning their possession. Rather, the problem is to find specific regulations that actually succeed in reducing violent crime. For example, small-caliber guns fire bullets that usually wound without killing, whereas large-caliber guns fire bullets that kill. Banning

⁸⁶ Daniel Polsby, *The False Promise of Gun Control*, THE ATLANTIC MONTHLY (March, 1994), p. 57.

⁸⁷ Arthur Kellerman et al., N ENGL. J. MED. October 7, 1993.

⁸⁸ Our thanks to John Lott, Jr., for this evidence. See LOTT, MORE GUNS, LESS CRIME (1999), for an extension of this argument.

large-caliber pistols in the United States might cause a shift in demand to small-caliber pistols and many fewer deaths.

QUESTION 13.18: Use economics to predict the ranking by crime rates of the following situations:

- no private person has a gun (effective prohibition).
- only criminals have guns (ineffective prohibition on criminals).
- everyone has easy access to guns.
- only honest citizens have access to guns.

QUESTION 13.19: Is it possible to design and enforce a law so that only honest citizens have access to guns?

QUESTION 13.20: Gun control is politically unpopular in neighborhoods with the highest crime rates in the United States. Use economics to explain why.

QUESTION 13.21: About 38,000 Americans die of gunshot wounds each year. Fewer than half these deaths are homicides. Accidents and suicides account for 54 percent of firearms deaths. Assume that guns in honest households deter crimes and cause accidental deaths. How would you compare the costs of each?



Web Note 13.5

In *More Guns, Less Crime*, John R. Lott, Jr., has attempted to show that when a state passes a “concealed carry” law—a law allowing registered gun owners to carry concealed weapons—there is a discernible subsequent decline in crime in that state. Lott argues that criminals are rational and that if they know that either their victims or those nearby the scene of a crime may have concealed handguns and that, therefore, the possibility of serious injury or death to the criminal is high, they are less likely to commit crime. On our website we review Lott’s arguments and survey the critique of his work.

VII. Explaining the Decline in Crime in the United States

In the almost two decades since 1991 serious crime in the United States has declined by almost 40 percent. What caused the decline? Steven Levitt, an economist, has identified four factors that caused the decline and six factors that some commentators falsely believe to have caused it.⁸⁹ This section describes the decline and its causes as identified by Levitt.

⁸⁹ Steven D. Levitt, *Understanding Why Crime Fell in the 1990s: Four Factors that Explain the Decline and Six that Do Not*, 18 J. ECON. PERSP. 163 (2004). We are going to suppress references to particular parts of this article in the remainder of the section. See also Steven D. Levitt & Thomas J. Miles, *Empirical Study of Criminal Punishment*, in A. MITCHELL POLINSKY & STEVEN SHAVELL, EDs., *HANDBOOK OF LAW AND ECONOMICS*, v. 1 (2007).

Recall that the decline in crime that began in the early 1990s affected both violent and nonviolent crime. Homicide rates fell by 43 percent from 1991 to 2001, reaching their lowest levels since the 1930s. The Federal Bureau of Investigation's (FBI's) indexes of violent and property crimes declined by 34 and 29 percent over the same period. Using data from the *Uniform Crime Reports* and the *National Crime Victimization Surveys*, Levitt summarizes these changes in the accompanying table, which we label Table 13.3.

He further shows that the declines in crime in the 1990s "affected all geographic areas and demographic groups. . . . The greatest percentage improvements in crime occurred within metropolitan statistical areas (MSAs) and especially among large cities with populations over 250,000."

The six factors that Levitt finds to have had little or no effect on the decline in U.S. crime in the 1990s are these: (1) the strong economy; (2) changing demographics; (3) better policing strategies; (4) gun control laws; (5) laws allowing the carrying of concealed weapons; and (6) the increased use of capital punishment.

TABLE 13.3
National Trends in Specific Categories of Crime

Crime Category and Data Source	Percentage Change in Crime Category, 1973–1991	Percentage Change in Crime Category, 1991–2001
Crimes reported to the police from UCR		
Violent crime	+82.9	–33.6
Homicide	+5.4	–42.9
Rape	+73.4	–24.8
Robbery	+50.0	–45.8
Aggravated assault	+118.1	–26.7
Property crime	+38.2	–28.8
Burglary	+3.0	–40.9
Larceny	+56.7	–23.2
Motor vehicle theft	+49.8	–34.6
Criminal victimization from the NCVS		
Violent crime	+1.6	–50.1
Rape	–20.0	–45.0
Robbery	–15.5	–53.3
Aggravated assault	–3.9	–56.9
Simple assault	+10.7	–47.0
Property crime	–32.0	–52.8
Burglary	–41.3	–55.6
Theft	–46.5	–51.6
Motor vehicle theft	+16.2	–58.6

Levitt, Table 2, p. 167.

1. The Strong Economy The period from 1991 to 2001 was the longest period of continuous growth in U.S. history, with real GDP per capita increasing by almost 30 percent and the annual unemployment rate falling to around 4 percent. One might reasonably have predicted that this strong economy contributed to the decline in crime by giving potential criminals better opportunities to earn income legally. However, as we have already seen earlier in this chapter, there is no good empirical evidence to suggest a correlation or causal connection between the ups and downs of the economy and the rate of crime. Levitt suggests that at best a 1 percentage point improvement in the unemployment rate leads to a 1 percentage point decrease in property crime (and no change in violent crime). So, the 2 percentage point decline in the average unemployment rate between 1991 and 2001 could have contributed only to a 2 percentage point decrease in the property crime rate. But in fact the property crime rate fell by 30 percent. Moreover, one should doubt the importance of economy-wide factors in explaining crime because crime increased significantly during the 1960s at the same time that there was vigorous economic growth and has not apparently increased since the onset of the Great Recession in 2008.

2. Changing Demographics We have already seen a strong causal connection between demography and crime: All other things being equal, the greater the proportion of young males in society, the greater the amount of crime. Conversely, the greater the proportion of older people, the lower the crime rate.⁹⁰ During the period under consideration, the percentage of 15- to 24-year-olds in the population increased from 13.7 percent to 14.6 percent, not enough to make much of a difference in the amount of crime. There were no other notable demographic changes during the period of declining crime—certainly nothing that could account for the dramatic decreases that occurred.

3. Better Policing Strategies Early in the 1991–2001 period, New York City tried some innovative policing strategies, such as “community policing,” and appointed a new, vigorous police commissioner. Because New York City had the greatest crime decline of any large city, commentators have often pointed to the change in policing strategies and the new commissioner as leading causes of the City’s great success in fighting crime.⁹¹

Levitt doubts that either of these changes had much to do with the pattern of New York City’s crime rate. First, the decline began before these changes were made. Moreover, there was no discernible acceleration in the trend—indeed, no change at

⁹⁰ “In 2001, people over the age of 65 had per capita arrest rates approximately one-fiftieth the level of 15- to 19-year-olds.” The victimization rates of the elderly are about one-tenth those of teenagers.

⁹¹ An influential theory underlying this change in policing strategies was the “broken windows” hypothesis attributable to James Q. Wilson & George L. Kelling, *Broken Windows: The Police and Neighborhood Safety*, THE ATLANTIC MONTHLY (March 1992), available at <http://www.theatlantic.com/politics/crime/windows.htm>. Professor Bernard E. Harcourt of the University of Chicago Law School criticizes the Wilson-Kelling hypothesis in *Illusion of Order: The False Promise of Broken Windows Policing* (2001).

all—at the point at which policing strategies changed or the new police commissioner assumed office. Second, the size of the New York City Police Department increased by 45 percent during the 1990s, a rate three times greater than the national average. As we will see, the increase in the number of police was far more important than the change in policing strategy. And third, most other cities did not institute the policing strategy changes that New York did, and yet they, too, had dramatic reductions in crime.⁹²

4. Gun Control Laws We have seen that there are more than 200 million firearms in private hands in the United States and that approximately 11,000 of the roughly 16,000 annual murders are by firearm. So, it might be the case that stricter gun control laws reduced crime—particularly homicide. However, Jens Ludwig and Philip Cook reported that those laws—notably the Brady Handgun Violence Prevention Act of 1993—had no statistically discernible effect on homicide trends.⁹³ Nor is there any other evidence proving that more strict gun control laws, or municipal policies to buy back guns, has had any effect on firearms violence.

5. Laws Allowing the Carrying of Concealed Weapons Instead of making gun control laws more strict, some states have loosened restriction on carrying concealed weapons. An empirical paper claims that laws allowing registrants to carry concealed weapons has had dramatic downward effects on crime rates, but Levitt and others believe that this claim is unproved.⁹⁴ (See Web Note 13.5.)

6. Increased Use of Capital Punishment There were four times as many people executed during the 1990s (478) as had been put to death in the 1980s (117). Levitt is almost certain that there was no effect on serious crime. First, few people on death row have actually been executed (53 executions in 2006 among 3,200 death-row inmates—less than 2 percent), and the delays in execution are so long that a “rational criminal should not be deterred by the threat of execution.” In fact, “the likelihood of being executed conditional on committing murder is still less than 1 in 200.” Many of those on death row would have a higher probability of dying violently in their home neighborhoods than dying on death row. Second, suppose that we take a figure from the deterrence literature that suggests that each execution deters six subsequent homicides. Then, “the observed increase in the death penalty from 14 executions in 1991 to 66 in 2001 would eliminate between 300 and 400 homicides, for a reduction of 1.5 percent in the homicide rate, or less than 125th of the observed decline in the homicide rate over this time period.”

⁹² An important (and controversial) fourth factor in New York, a factor that we have already explored, was the fact that New York City had abortion rates in the 1970s that were among the highest in the country. And New York State legalized abortion in 1970, three years before the Supreme Court’s decision in *Roe v. Wade*, 410 U.S. 113 (1973). Be sure to see Web Note 13.3 for a critique of the hypothesis that there is a connection between abortion rates and later crime rates.

⁹³ Jens Ludwig & Philip J. Cook, *Homicide and Suicide Rates Associated with Implementation of the Brady Handgun Violence Prevention Act*, 284 J. AM. MED. ASSOC. 585 (2000).

⁹⁴ See John R. Lott, Jr. & David B. Mustard, *Crime, Deterrence, and the Right to Carry Concealed Handguns*, 26 J. LEGAL STUD. 1 (1997). The hypothesis is extended in JOHN R. LOTT, JR., *MORE GUNS, LESS CRIME: UNDERSTAND CRIME AND GUN-CONTROL LAWS* (1998).

C. Four Factors That Explain the Decline in U.S. Crime in the 1990s

The four factors to which Levitt gives credit for the decline in crime are these: (1) increases in the number of police; (2) the rising prison population; (3) the receding crack epidemic; and (4) the legalization of abortion in the early 1970s. We have already devoted an entire section to the argument and evidence regarding abortion's role in the decline in crime. Here we will summarize the other factors.

1. Increases in the Number of Police The number of police can have an important deterring effect on crime. Thomas Marvell and Carlisle Moody estimated in the mid-1990s that the elasticity of crime with respect to the number of police is -0.30 .⁹⁵ That is, a 10 percent increase in the number of police would cause a 3 percent decrease in crime. Levitt somewhat later found elasticities of crime with respect to the number of police to be in the range of -0.43 to -0.50 .⁹⁶ (Note how much larger both of these estimates are than the elasticity of crime with respect to incarceration.) The total number of police officers in the United States increased by 50,000 to 60,000 during the 1990s, an increase of 14 percent. If we use an elasticity measure of -0.40 , then we can attribute 5 to 6 percent of the decline in crime during our period to the increase in the number of police. That is, this factor alone explains between one-fifth and one-tenth of the overall decline.

2. The Rising Prison Population We have already seen that the U.S. prison population quadrupled between 1980 and 2002. Slightly more than half that increase occurred during the 1990s. There is good evidence that the elasticity of crime with respect to expected punishment ranges between -0.10 and -0.40 . (The evidence suggests a figure in the higher end of the range for violent crime and something toward the lower end of the range for property crime.) Assume an elasticity of -0.30 for violent crime with respect to expected punishment and -0.20 for property crime. Then, increases in expected punishment "can account for a reduction in crime of approximately 12 percent for the first two categories and 8 percent for property crime, or about one-third of the observed decline in crime."

3. The Receding Crack Epidemic Crack cocaine, which is produced by heating a mixture of powder cocaine and baking soda into airy nuggets, appeared in the mid-1980s and found a lucrative and rapidly expanding market. The new form of cocaine was relatively inexpensive and produced an intense and short high. The competition to sell this illegal product was intense, so much so that gang violence associated with this competition became a significant problem in the United States beginning in 1985. As a result, homicide rates for young black males under the age of 25 rose very rapidly through the end of the 1980s.

⁹⁵ Thomas Marvell & Carlisle Moody, *Specification Problems, Police Levels, and Crime Rates*, 34 *CRIMINOLOGY* 609 (1996).

⁹⁶ Levitt, *Using Electoral Cycles in Police Hiring to Estimate the Effect of Police on Crime: A Reply*, 92 *AM. ECON. REV.* 1244 (2002). Levitt used changes in the number of firefighters as an instrument for changes in the number of police.

But then in the early 1990s the crack epidemic began to wane, and with it so did the very high homicide rate for young black males. That rate fell by almost 50 percent during the period 1991–2001, compared with a decline of 30 percent in the homicide rate for adult white males. Levitt estimates that the decline of crack cocaine might account for about 15 percent of the fall of all homicides during the decade. He estimates that the impact of less crack on other crimes is significantly smaller, perhaps 3 percent.

D. A Summary

The crime rate dropped 30 to 40 percent from 1991 to 2001 in almost all categories of crime and all regions. Levitt summarizes his explanation in Table 13.4. His heroic efforts provide a useful basis for discussion, but many puzzles remain, such as why Canada's experience with changing crime rates closely resembles that of the United States, even though Canada's policies were different.⁹⁷

TABLE 13.4
Summarizing the Estimated Contribution of Various Factors
to the Decline in Crime in the 1990s

Factor	Percentage Change in Crime that this Factor Accounts for Over the Period 1991–2001			Certainty Level of Estimated Impact
	Homicide	Violent Crime	Property Crime	
Strong economy	0	0	–2	High
Changing demographics	0	–2	–5	High
Better policing strategies	–1	–1	–1	Low
Gun control laws	0	0	0	Medium
Concealed weapons laws	0	0	0	High
Increased usage of capital punishment	–1.5	0	0	Medium
Increases in the number of police	–5.5	–5.5	–5.5	Medium
Increases in the prison population	–12	–12	–8	High
The decline of crack	–6	–3	0	Low
Legalized abortion	–10	–10	–10	Medium
Total of all factors considered	–36	–33.5	–31.5	
Actual change in UCR reported crime	–43	–34	–29	
Actual change in NCVS victimization	—	–50	–53	

Levitt, Table 5, p. 184.

⁹⁷ See FRANKLIN E. ZIMRING, *THE GREAT AMERICAN CRIME DECLINE* (2008).

Conclusion

In this chapter we have used the economic theory of crime and punishment to examine some pressing policy issues in criminal justice. Economic theory is valuable in framing the problems and the possible solutions, and empirical research is necessary to weigh the policy options designed to minimize the social costs of crime.

Suggested Readings and Viewings

Bar-Gill, Oren, & Alon Harel, *Crime Rates and Expected Sanctions: The Economics of Deterrence Revisited*, 30 J. LEGAL STUD. 485 (2001).

Harcourt, Bernard, & Jens Ludwig, *Broken Windows: New Evidence from New York City and a Five-City Social Experiment*, 73 U. CHI. L. REV. 271 (2006).

Krueger, Alan B., & Jitka Maleckova, *Education, Poverty, and Terrorism: Is There a Connection?*, 17 J. ECON. PERSP. 119 (2003).

Levitt, Steven D., *Using Electoral Cycles in Police Hiring to Estimate the Effect of Police on Crime*, 87 AM. ECON. REV. 270 (1997). See also Levitt, *Reply*, 92 AM. ECON. REV. 1244 (2002).

Milhaupt, Curtis, & Mark D. West, *The Dark Side of Private Ordering: An Institutional and Empirical Analysis of Organized Crime*, 67 U. CHI. L. REV. 41 (2000).

Simon, David, *The Wire*, Seasons 1 – 5 (HBO Productions, 2002–2008).

Stuntz, William, *Local Policing After the Terror*, 111 YALE L. J. 2137 (2002).

VENKATESH, SUDHIR, *GANG LEADER FOR A DAY* (2008).