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## Punishment and Crime Across Space and Time

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*Michael Tonry and David P. Farrington*

# Punishment and Crime across Space and Time

Crime rates rose in the United States from the mid-1960s through the early 1990s;<sup>1</sup> imprisonment rates began rising in 1973 and continued to do so through 2005. To the man on the street and many politicians, those patterns appear to tell a comforting story. As crime rose, more miscreants were arrested, prosecuted, convicted, and imprisoned, and imprisonment rates increased. After a long while, nearly twenty years, the deterrent and incapacitative effects of increased imprisonment took hold, and crime rates fell. “Prison works,” as some politicians are quick to claim.

The logic is tidy but the conclusion is not necessarily right, as comparisons of the United States and Canada show (Tonry 2004, fig. 5.23). Crime rate trends in Canada have closely paralleled those in the United States since 1970. When America’s crime rates rose, so did Canada’s. When America’s crime rates fell, so did Canada’s. However, there is no resemblance between American and Canadian imprisonment trends. After a four-decade-long period of stable imprisonment rates (Blumstein and Cohen 1973), the American rate grew continuously after 1973, more than quadrupling to 700 per 100,000 population, and the absolute

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<sup>1</sup> That is the simplest way to say it. More complexly, official rates of recorded crime rose through the early 1980s, fell for five years, rose again through 1990–91, and fell continuously thereafter. The trends shown by victimization data are slightly different but agree that crime has been falling since the early 1990s.

number of people imprisoned increased even more. Canada's total imprisonment rate has remained essentially flat for four decades, generally fluctuating around a narrow band of 100–110 prisoners per 100,000.

So, if the increasing volume of crimes and criminals inexorably caused American imprisonment rates to rise and prisons to bulge, why didn't the same thing happen in Canada? And if greatly increased severity of punishment and higher imprisonment rates caused American crime rates to fall after 1990, what caused the Canadian rates to fall? The story must be more complicated than the man on the street or most American politicians know.

Other pairs and sets of adjacent countries with similar cultures provide further demonstrations that the relations between crime and punishment rates are not inexorable.<sup>2</sup> Scandinavia provides the best. Crime rate trends in Denmark, Finland, Norway, and Sweden, as shown by official data, have moved in parallel for more than forty years. When rates in one country rise, they rise in all; when rates fall in one, they fall in all. Overall, for all four countries, crime rates rose substantially between 1965 and 2000, with lots of intermediate ups and downs.

Imprisonment rates in Denmark, Norway, and Sweden were broadly stable between 1960 and 2000, ranging between fifty and seventy per 100,000. Finland's fell by two-thirds, from around 180 per 100,000 in 1960 to sixty in 2000. If punishment affects crime, Finland's crime rate should have shot up, compared with crime rates in the rest of Scandinavia. To the contrary, Finland's crime trends closely paralleled the rest of Scandinavia, and, throughout, Finland held its initial relative position of having the second-lowest crime rates in Scandinavia (Lappi-Seppälä 2001, 2004).

So what happened in Finland? If harsher penalties and higher imprisonment rates should reduce crime rates, shouldn't a sustained long-term reduction in severity and in imprisonment rates increase crime rates?<sup>3</sup>

<sup>2</sup> Between 1950 and 1995, English crime rates increased much more than those in Scotland. From 1980 through 1995, crime rates in Scotland leveled off without any marked increase in punishment. English crime rates rose substantially between 1980 and 1993, reaching a peak from which they continue to fall. English imprisonment rates fell steeply in the late 1980s and nearly doubled between 1993 and 2005 (Smith 1999). Smith concludes, "at a minimum, these findings suggest that it is possible to have less crime without more punishment" (p. 316).

<sup>3</sup> A similar comparative question can be asked about the Netherlands, which has had continuously rising imprisonment rates since 1973, with a relative rise (fourfold) comparable to that in the United States, in contrast to Belgium, which had a much lesser increase in imprisonment rates but comparable crime trends over decades (van Rullers and Beijers 1995; Junger-Tas 2001).

Comparative and cross-national questions about crime and punishment have become easier to ask and answer in recent years because a comparative and cross-national literature on penal policy is beginning to accumulate. Language barriers, noncomparability of national crime data, and simple parochialism long conspired to make credible cross-national comparisons nearly impossible, but those problems are becoming more manageable.

Cross-national analyses traditionally have been based primarily on comparisons of official crime rates and imprisonment rates per 100,000. Official crime rates, however, are considerably less complete than are data from victim surveys and may be misleading because of changes over time in victim reporting to police, police recording of reported crimes, and police agency reporting to central data banks. It is important to investigate to what extent increases in imprisonment rates reflect increases in the number of crimes committed, increases in the probability of conviction given a crime, increases in the probability of custody given a conviction, increases in sentence lengths, or increases in the fraction of time served.

The project whose fruits are presented in this volume attempted to standardize crime and punishment data from eight countries so that we can begin to look meaningfully across national boundaries. It sought to obtain and present more sophisticated, valid, and informative data than are available anywhere else. The countries are Australia, Canada, England (and Wales), the Netherlands, Switzerland, Scotland, Sweden, and the United States. Although there are some well-known differences between inquisitorial civil law and adversarial common law systems and procedures, the criminal justice systems of the eight countries are much more similar than different.

The most challenging differences for our purposes are in the details of criminal law codification and the organization of information systems. There are substantial differences between countries in how offenses are defined. In some, for example, murder includes both completed and attempted killings. In others, only completed killings count.

Burglary is a separate offense in some countries, but not in others, and where it is a separate offense, it does or does not include both residential and commercial incidents. In some places, there is no separate burglary offense at all and crimes that would be counted as burglaries in the United States or England are counted under various other property offense classifications.

Some motor vehicle theft definitions distinguish between automobiles and other motorized vehicles; some do not. Some distinguish between thefts of and from vehicles; others do not. Sometimes, as in Switzerland, all motorized vehicles are classified together, which means that, as happened, a great reduction in theft of mopeds and light motorcycles can produce an enormous drop in “motor vehicle crimes.” For an opposite phenomenon, Dutch recording practices do not include joyriding among motor vehicle thefts; this means that the offenses counted are mostly more serious organized “professional” vehicle thefts that are dealt with more seriously and punished more severely. What might otherwise seem unusually low Dutch motor vehicle theft rates and unusually severe sentencing practices may instead result from how offenses are classified.

None of the countries has a fully integrated, offender-based transactional information system, which means that aggregate data must typically be cobbled together from different sources. This is easiest in a sparsely populated country such as Sweden, with 9 million people, highly centralized governmental institutions, and unique national identity numbers for citizens. It is hardest in large or populous federal systems characterized by strong separation-of-powers doctrines and by criminal justice institutions organized at state or provincial levels.

Part of the process of developing this volume consisted of identifying significant ways in which offense definitions, recording practices, and information systems differed and developing techniques to adjust for the effects of those differences. This was easier to do for victimization and recorded crime data than for case-processing data.

For processing data it was easier to do for countries with smaller populations and unitary (nonfederal) systems of government (namely, the Netherlands [16 million], Scotland [under 6 million], and Sweden) than for more populous and federal countries (Australia, Canada, and the United States). England, a populous country (approximately 55 million), with centralized institutions, and Switzerland, a small (under 8 million people) federal country, fell in between.

It was most difficult for Canada and Australia because national data systems for judicial and correctional processes incorporating state and provincial data remain incomplete, underdeveloped, and often unreliable. The U.S. Bureau of Justice Statistics (BJS) has been working on solving these problems for more than thirty years, so though the United States potentially faces the same impediments as Canada and Australia, problems of data reliability are considerably less acute.

From each of eight countries, data on offending were drawn from victimization surveys and police records, and case processing data were drawn from police, court, and correctional sources.<sup>4</sup> We attempted to identify all relevant differences among the offenses we studied, as well as numerous differences between countries in the organization and completeness of data systems.<sup>5</sup>

In this introduction, we discuss current knowledge of cross-national patterns of crime and punishment. We rely primarily on data made possible by this project but try to provide contexts by referring to data drawn from other sources. Section I describes the methods employed in this project in some detail. Section II discusses cross-national comparisons of crime levels and patterns over time. Section III discusses cross-national comparisons of punishment levels, patterns, and trends over time. The conclusion summarizes major findings concerning crime and punishment trends cross-nationally and sets out methodological suggestions for improving future initiatives such as this one.

We draw a number of conclusions: According to both victim survey data and police records, burglary rates fell in most of the countries during the 1990s, with the steepest declines occurring in Canada, England, the Netherlands, Scotland, and the United States. The pattern for robbery was more mixed.<sup>6</sup> Homicide rates either fell substantially toward the end of the twentieth century or were essentially flat at low levels between one and two per 100,000 population. Except for Canada, where both survey and recorded rates rose, and Sweden, where there was no clear pattern, motor vehicle theft rates fell in every country during the 1990s and in several during the 1980s. These conclusions parallel those that would be drawn from data for 1995–2000 from the *European Sourcebook of Crime and Criminal Justice Statistics* (Council of Europe, Committee of Experts 2003): homicide,

<sup>4</sup> This volume contains essays on all those countries except Sweden, but Swedish data are used in this introduction and in three essays that draw on all eight (Cook and Khmylevska, in this volume; Farrington and Jolliffe, in this volume; Blumstein, Tonry, and Van Ness, in this volume). A more technical companion volume published by the U.S. Bureau of Justice (Farrington, Langan, and Tonry 2004), containing additional data, contains chapters on all eight countries.

<sup>5</sup> Each essay discusses definitions and problems in achieving cross-national comparability. The fullest discussion of definitional differences among European countries can be found in the *European Sourcebook of Crime and Criminal Justice Statistics, 2003* (Council of Europe, Committee of Experts 2003).

<sup>6</sup> Either discordant results for victim survey and official data, broad stability according to one or both, or volatility according to one or both.

burglary, and motor vehicle theft declines in most countries, with a more mixed pattern for robbery.

United States policies were the most punitive of the eight countries by every measure: probability of commitment given a conviction, expected days imprisonment per recorded crime, expected days imprisonment per conviction, and average times served by those imprisoned. National punishment policies vary substantially not only in imprisonment rates but also in more complex ways: Sweden achieves low imprisonment rates by combining high probabilities of imprisonment given a conviction with relatively short sentence lengths. Switzerland achieves comparably low imprisonment rates for convicted offenders by combining low probabilities of imprisonment with relatively long sentence lengths. Across all eight countries, there were few distinct trends in commitment probabilities or average sentence lengths. In England there were clear upward trends in average time served in the 1990s for four of the six offenses studied. There were marked increases in Scotland in the probability of custody given a conviction and in Australia in average time served.

We draw no strong conclusions concerning the effects of national differences in punishment policies and practices on crime rates. However, we found no evidence that robbery or burglary rates are correlated with national differences in time served in prison. James Q. Wilson has rightly observed that "social scientists have made great gains in explaining why some people are more likely than others to commit crimes but far smaller gains in understanding a nation's crime rate" (Wilson 2002, p. 537). Cross-national differences in legal and political culture, institutional arrangements, and constitutional traditions and values shape both crime and punishment in ways that no one has yet figured out how to quantify (Zimring and Hawkins 1991; Young and Brown 1993).

## I. Methods

It is not easy to explain trends in national crime rates, the probability and severity of legal punishment, and differences between countries. There are enormous problems of comparability over time and between countries, in laws, measurement methods, recording practices, and macrosocial, cultural, and political factors. However, the first step in moving toward explanations is to obtain comparable data over time and space. Writers from the

<sup>1</sup> The findings reported here are based on calculations shown in Blumstein, Tonry, and Van Ness (in this volume).

eight countries were asked to pull together crime and case processing data, when necessary to adjust and reclassify it to make it as comparable as possible across countries and time, and then to carry out a series of calculations prescribed by a common template (see the appendix).

### *A. Similar Prior Research*

The essays in this volume build on a series of earlier efforts to characterize the operation of national criminal justice systems, initially in England alone and then in comparison with the United States and Sweden. The aim of those efforts was to estimate crime-specific numbers flowing through the criminal justice system at each stage, from crimes committed to crimes reported to the police, crimes recorded by the police, offenders convicted, offenders sentenced to custody, average sentence length, and average time served.

The best way to do this would be to conduct a longitudinal study that tracked offenders through the criminal justice system, using a unique identification number for each offender at each stage. National-level data tracking individual offenders are not available in most countries. Aggregate national data, however, are available for many key stages (e.g., crimes committed, persons convicted, persons sentenced to custody). These separate counts permit reasonably accurate estimates of the flows of offenders from one stage to the next.

In the first of the efforts to do this comparatively, Farrington and Langan (1992) estimated numbers flowing through the criminal justice systems of England and the United States and compared trends over time (between 1981 and 1987 in England and between 1981 and 1986 in the United States). The starting point for England was 1981 because that was the year of the first British Crime Survey.

Farrington and Wikström (1993) then compared trends between 1981 and 1987 in England and Sweden. Farrington, Langan, and Wikström (1994) compared all three countries, extending the previous analyses to 1981 to 1991 for England and Sweden and 1981 to 1990 for the United States.

The first three cross-national analyses reported changes between two widely separated times rather than trends over time, making it difficult to know when changes occurred and how to explain them. A fourth study (Langan and Farrington 1998) calculated all numbers and probabilities for seven years in the United States (1981, 1983, 1986, 1988, 1990, 1992, and 1994) and for six years in England (1981, 1983, 1987, 1991, 1993, and 1995). The American years were those in which the



National Judicial Reporting Program survey was carried out (1986, 1988, 1990, 1992, and 1994); it provided the numbers of adults convicted and sentenced to custody, plus 1981 and 1983, for which estimates of these quantities were derived. The English years were those in which the British Crime Survey was carried out, providing estimates of the numbers of crimes committed and reported to the police.<sup>8</sup> All of the needed information was not available for other years. The work reported in this volume is modeled on that fourth study and extends the analyses to encompass time trends in eight countries between 1981 and 1999.

### *B. Methods*

The eight countries were chosen because large-scale representative national victimization surveys had been conducted in each at least three times between 1981 and 1999, and they otherwise appeared to have adequate criminal justice data. National victimization data from the separate countries were used rather than data from the International Crime Victims Survey (ICVS; Kesteren, Mayhew, and Nieuwbeerta 2000) because the sample sizes in the ICVS, typically about 2,000 per country, and the nonresponse rates, typically 30–50 percent, were unsatisfactory for our purposes (especially for estimating linking probabilities for particular crimes).

Six serious crimes were studied for the years 1980 through 1999: residential burglary, vehicle theft, robbery, serious assault, rape, and homicide. For each, the following information was obtained: the number of crimes committed (according to a national victimization survey), the number of crimes reported to the police (according to a national victimization survey), the number of crimes recorded by the police, the average number of offenders committing each crime, the number of persons convicted, the number of persons sentenced to custody, the average sentence length, and the average time served. These quantities are then compared in each country with the national population, and linking probabilities are estimated (e.g., the probability of an offender being convicted, the probability of a convicted person being sentenced to custody).

<sup>8</sup> The rationales for the two countries' coverage dates differ because the U.S. National Crime Victimization Survey is carried out continuously with each household interviewed at six-month intervals while the British Crime Survey was then conducted at longer and irregular intervals. Conversely, because England is a unitary governmental entity, routinely compiled statistics on sentencing and punishment are available for every year.

In order to relate crimes committed to persons convicted, the average number of offenders committing each crime must be known. If, for example, three persons jointly commit one crime, this can lead to three persons being convicted. In calculating the probability of an offender being convicted, it is important, therefore, to divide the number of persons convicted (in this example, three) by the number of offenders (the number of offender-crime pairs, which in this example is three), not by the number of crimes (in this example, one).

Because of problems of comparability, data were not collected on all possible stages of the criminal justice system or on all possible sentences. For example, while U.S. national data on arrests have been published annually for many years, national arrest data were not collected in England until 1999. In many continental European countries, police record suspects, not all of whom are arrested, rather than arrests. Consequently, the individual country analyses are based variously on crimes reported in victimization surveys or on offenses resulting in convictions. Concerning punishment, the individual country analyses focus on convictions and custody because the problems of comparability were much less daunting than if other sanctions such as suspended sentences, probation, fines, and other community penalties were separately considered.

The individual country analyses address the following key questions that any theory of crime or criminal justice should be able to explain: How has the crime rate changed over time? Has the probability of a victim reporting a crime to the police increased or decreased over time? Has the probability that the police will record a crime that is reported to them increased or decreased over time? Has the conviction rate changed over time? Has the probability that an offender will be convicted increased or decreased over time? Has the probability that a convicted offender will be sentenced to custody increased or decreased over time? Has the average sentence length changed over time? Has the average time served changed over time? Has the average time served per offender increased or decreased over time?

### *C. Issues of Comparability*

The writers made Herculean efforts to comply with the template (see the appendix) and to achieve comparability over time. However, as the essays on individual countries explain, there are still problems of comparability. The most important concern crime definitions, victim surveys, and time served. There were fewer problems of comparability

in regard to police-recorded crimes, persons convicted, persons sentenced to custody, and sentence lengths.

In regard to crime definitions and legal codes, there was a major problem in distinguishing between serious and minor assaults, and serious assaults in one country may not be very comparable to serious assaults in another. Changes over time in rates of serious assaults within a country are more valid than comparisons between countries. Burglary and vehicle theft caused difficulties in continental European countries (the Netherlands, Sweden, Switzerland) because they are not distinguished explicitly from other types of theft in legal codes. However, the authors were able to estimate the numbers of these crimes through various adjustments.

Between 1981 and 1999, the laws on rape in several countries were changed to make definitions more comprehensive (e.g., including anal and oral sex, males as victims and females as offenders, and acts between husbands and wives). Writers made various adjustments to estimate the number of rapes with male offenders and female victims in an effort to make the numbers comparable over time and between countries. During the same period, the wordings of questions in the national victim surveys in several countries were changed in order to reveal more domestic violence, but writers again made adjustments to make the numbers comparable over time. Robbery and homicide were more consistently defined over time.

The United States was the only country in which a large-scale national victimization survey was conducted every year. Sweden had a large-scale omnibus survey every year containing some victimization questions, but it did not provide data on robbery. The Netherlands had three different national victim surveys that permitted annual estimates, but they differed in some significant respects and their results were not totally concordant. England had eight large-scale national victim surveys between 1981 and 1999, Scotland had five, Switzerland had five, Canada had three (plus a large-scale city survey which permitted national estimates), and Australia had three (but national estimates could also be estimated from annual surveys in New South Wales, which accounts for about two-thirds of Australia's crime). Conclusions about trends and correlations based on five or fewer years inevitably are fragile.

The average time served was estimated in different ways in different countries. In Switzerland, it was available in a sophisticated correctional database. In the Netherlands, offenders serve fixed proportions

of their sentences. In England, the estimate of average time served was based on release cohorts of prisoners. In the United States, the fraction of time served (based on release cohorts) was applied to sentences given to estimate the time expected to be served. In Scotland and Sweden, the expected time to be served was estimated from laws and parole regulations. In Australia, the average time served was estimated from the expected time to be served by the population of prisoners (obtained in a prison census); unfortunately, the daily population contains relatively more long-serving prisoners than entering or release cohorts. In Canada, it was not possible to derive a satisfactory estimate of time served.

These difficulties in obtaining comparable data in eight countries highlight fundamental problems and inadequacies of existing crime and case processing data in most countries. In no country was there a satisfactory measure of the number of offenders per crime, which is essential for linking crime data to offender data.

## II. Cross-National Comparisons of Crime

Few sources of data are available to support cross-national analyses of crime rates or to test hypotheses about possible crime-reductive effects of changes in policy or practice—such as increases in certainty of conviction or prison commitment, or in severity of punishment.<sup>9</sup> Simple comparisons of recorded data from several countries are inherently unreliable for reasons already discussed.

Several compilations of data from numerous countries are available, but mostly they are little more useful. There are three principal sources of official data from multiple countries: the International Criminal Police Organization (Interpol), the United Nations, and the *European Sourcebook of Crime and Criminal Justice Statistics*.<sup>10</sup>

The Interpol data consist of undigested police data on recorded crimes from reporting nations.<sup>11</sup> They are subject to all the standard noncomparability problems and the additional ones that no one knows

<sup>9</sup> Although there is no doubt that having penalties compared with not having them has general deterrent effects, the clear weight of the evidence in the American literature is that changes in the severity of sanctions have few or no demonstrable crime-preventive effects (e.g., Blumstein, Cohen, and Nagin 1978; Nagin 1998; Doob and Webster 2003).

<sup>10</sup> The World Health Organization, in addition, has since 1951 collected data on homicides from health records of countries willing to provide them. The data do not distinguish between intentional and unintentional homicide.

<sup>11</sup> See <http://www.interpol.int>.

how accurate and complete the national reports are, or how consistently data are reported and recorded over time.

Data collected by the United Nations (UN) suffer from the same problems. The UN has since the mid-1970s surveyed member nations on recorded crime rates and counts. Questionnaires for the eighth survey covering 2001 and 2002 were distributed to 191 countries in 2003. Data from the seventh survey covering ninety-two countries for the three years 1998–2000 are available on the Web.<sup>12</sup>

The second edition of the *European Sourcebook of Crime and Criminal Justice Statistics* (Council of Europe, Committee of Experts 2003) provides official data on crime from thirty-nine countries for 1995–2000. National correspondents collect and submit national data on crime and other subjects.<sup>13</sup> A committee of experts reviews the data and undertakes a number of consistency checks (referring questions and problems back to the national correspondents). The report contains detailed discussions of definitional differences. At day's end, the data, though presented as cleanly and accurately as they can be, have not been adjusted to take account of definitional differences and, thus, cannot be used for cross-national and comparative analyses. Offense rates per 100,000 population are given for each year between 1995 and 2000 for intentional homicide, rape, robbery, assault, theft, motor vehicle theft, burglary, traffic offenses, and drug offenses, thus permitting at least trend analyses within countries (assuming consistent reporting and record keeping within a country and accurate reporting of that data to the sourcebook compilers).

The sourcebook introduction notes comparability problems that make comparative conclusions about absolute levels of crime suspect but argues that trend comparisons within and between countries are more credible so long as statistical and definitional circumstances are controlled (Council of Europe, Committee of Experts 2003, p. 20). Assuming that argument is plausible, one would conclude from the official data for 1995–2000 that homicide rates increased in only three of thirteen Western European countries for which results were available, burglary in only one of twelve, and motor vehicle theft in six of thirteen.

<sup>12</sup> See [http://www.unodc.org/unodc/en/crime\\_cicp\\_surveys.html](http://www.unodc.org/unodc/en/crime_cicp_surveys.html).

<sup>13</sup> Data are also compiled on prosecutions, convictions, sentences, and correctional populations. Victimization data are taken from the International Crime Victimization Survey. The introduction to the second edition (Council of Europe 2003, pp. 1–20) and European Sourcebook Group (2004) describe the collection and quality control system in detail.

Rape and robbery rates, however, increased in eleven of fourteen countries, and assault in all fourteen (2003, chap. 1).

The decreases are for offenses that are not especially susceptible to cultural changes affecting reporting and recording, and accordingly it would be reasonable to conclude that homicide, burglary, and motor vehicle theft declined in most countries. The increases are for assault and rape, for which both reporting and recording increased in many countries, and for robbery, for which reporting and recording may also have been affected by declining tolerance of violence (Blumstein and Beck 1999). Because the most reliable crime counts are for homicide, and assault and robbery rates should be probabilistically related to homicide rates, there is reason to be skeptical that the official data reported in the sourcebook reflect reality.<sup>14</sup> Accordingly, we believe that no conclusions about true crime trends can be drawn from sourcebook data about recorded rates of rape, robbery, and assault.

There are two potential sources of cross-national victimization data: national victimization surveys and the International Crime Victimization Survey. The former, not conducted annually in most countries, suffer from definitional differences similar to those that affect comparisons of official records. They also suffer from major methodological differences.<sup>15</sup> It would be difficult credibly to draw cross-national conclusions from a set of national surveys characterized by different definitions and instruments, administered by different methods, covering different time periods at differing intervals, and taking different approaches to telescoping.

The ICVS, conducted in many countries in 1989, 1992, 1996, and 2000, attempts to address those comparability problems by describing crimes in standardized plain-language terms rather than in terms of local criminal law definitions, using the same survey instrument in every country, and in most countries administering the survey to representative samples the same way (computer-assisted telephone interviews).

<sup>14</sup> If, for example, homicide rates are declining, accurate counts of assault and robbery also should show decline. Homicide is probably the most reliably counted crime, and health mortality statistics provide a validating check. Assuming no major changes in the lethality of weapons or the circumstances of assaults and robberies, their occurrence should be probabilistically correlated with the occurrence of homicides. If recorded serious assaults increase much more rapidly than recorded homicides, changes in reporting or recording are likely to be a major part of the explanation.

<sup>15</sup> One of the most significant is that only the United States survey uses bounding interviews to minimize telescoping and uses a panel model in which the same household remains in the survey for multiple (seven) waves of data collection (data from the first, bounding, wave are not reported).

Two major problems are low response rates, ranging in 2000 from 45 to 81 percent (with most in the high 50s and low 60s), and samples too small for adequate coverage of serious crimes (particularly rape and robbery; Kesteren, Mayhew, and Nieuwebeerta 2000, app. 1, table 1).<sup>16</sup>

The ICVS does provide some fairly robust findings, however: first, that overall crime rates as measured by victimization rose after 1988 in seven countries (Canada, England and Wales, Finland, France, the Netherlands, Scotland, and Switzerland), peaked in the early or mid-1990s, and fell through 2000 (in the United States, victimization fell continuously from 1988); second, that victimization rate rankings among the eight countries remained the same through all four waves except for the United States and Canada, which were high-rate countries in 1988 and low-rate ones in 2000. England and the Netherlands had high rates throughout, and Finland and Switzerland had low rates (Kesteren, Mayhew, and Nieuwebeerta 2000, pp. 91–92, figs. 15 and 16).

The data assembled for the project reported in this volume allow analyses not possible with data from any of the other sources described. Many cross-national comparisons can be carried out; the U.S. Bureau of Justice Statistics' versions of the essays in Farrington, Langan, and Tonry (2004) contain spreadsheets that provide the data on which tables and figures are based, and these, of course, can be used by others for original analyses.<sup>17</sup>

To provide illustrations, we focus in this introduction on one property crime, burglary, and one violent crime, robbery. We focus on these offenses because survey crime data are not available for rape and homicide, comparability problems between countries are greatest for serious assault, and motor vehicle theft is less interesting and less serious than burglary. In this section we focus on crime trends and in the next on punishment trends. We use both victimization and recorded crime rates.

### *A. Burglary*

Figure 1 shows changes in the survey burglary rate for all eight countries over the twenty-year period. The rate was consistently highest

<sup>16</sup> One additional possibly important problem is that there may be significant national and cultural thresholds below which behaviors (e.g., forms of domestic and acquaintance violence, or household theft) are not seen as warranting mention, thereby creating selection effects that distort cross-national comparisons; in addition, because the ICVS is a household survey that relies heavily on computer-aided telephone interviews, it undercounts households lacking telephones and undercounts young, mobile, disadvantaged groups with high offending and victimization rates.

<sup>17</sup> These data may be obtained electronically from <http://www.ojp.usdoj.gov/bjs>.

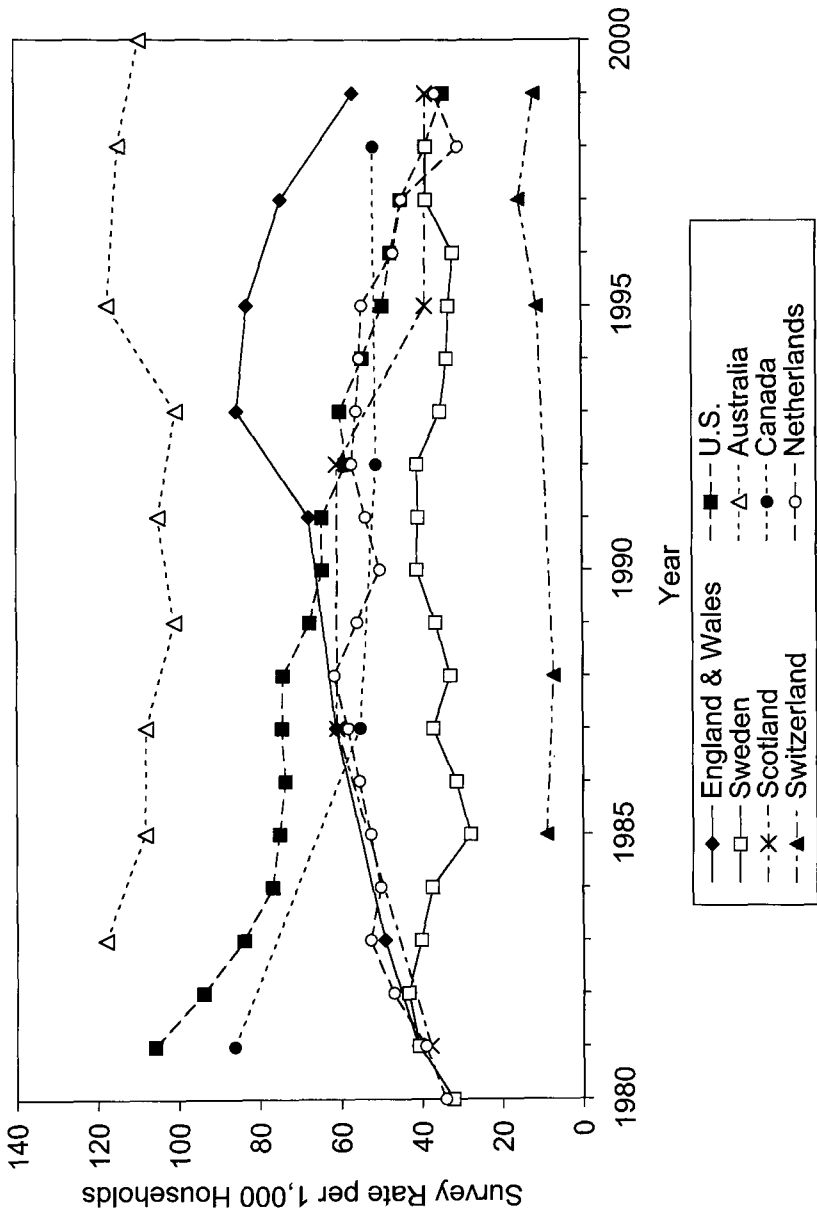


FIG. 1.—Burglary: survey crime rate



in Australia and lowest in Switzerland (followed by Sweden). It increased in England through 1993 and then decreased, while it decreased steadily in the United States.

Table 1 shows correlations between the survey burglary rate and the year. The correlations in table 1 were calculated in order to get a rough idea of whether survey crime rates were increasing or decreasing. We assume that a positive correlation higher than 0.4 indicates a general increase, a negative correlation less than  $-0.4$  indicates a general decrease, and a correlation between 0.4 and  $-0.4$  indicates no clear trend. These numbers are somewhat arbitrary but differences in correlations do reflect differences in trends.

The correlations indicate how close the relationship was to a linear trend; for example, the 0.76 correlation between survey burglary rate and year in Switzerland shows a general increase over the time period. The large negative correlations for the United States and Canada, by contrast, show the continuous and considerable declines in those countries. The correlations, however, are but crude indicators because they do not account well for long-term shifts in direction. For example, the 0.67 correlation between survey burglary rate and year in England and Wales shows that survey crimes generally increased over this period (there was a large increase from 1981–93 and a smaller decrease from 1993–99), but looking at the positive correlation alone might obscure the important finding of significant declines in the most recent years.

Correlations were positive in England (0.67) and Switzerland (0.76), negative in the United States ( $-0.97$ ) and Canada ( $-0.83$ ), and low in the other four countries. It should be borne in mind that these correlations are based on only four years for Canada and five years for Scotland and Switzerland.

Figure 2 shows changes in the recorded burglary rate for all eight countries. For at least some period after 1995, recorded burglary rates declined in most countries.

Absolute rates were highest over the entire period in Scotland and Australia and lowest in Switzerland and Sweden. Over two decades, rates increased steadily in Australia, decreased steadily in the United States, and trended gently downward in Canada. Correlations shown in table 1 between the recorded burglary rate and the year were positive for Australia (0.97), Switzerland (0.87), the Netherlands (0.78), and England (0.48) and negative for the United States ( $-0.95$ ), Scotland ( $-0.64$ ), Canada ( $-0.56$ ), and Sweden ( $-0.44$ ).

TABLE 1  
Correlations with Year

	England and Wales	United States	Sweden	Scotland	Netherlands	Australia	Canada	Switzerland
Burglary								
Survey rate	.67	-.97	-.10	-.15	-.10	.02	-.83	.76
Recorded rate	.48	-.95	-.44	-.64	.78	.97	-.56	.87
Convictions/1,000 offenders	-.89	.82	-.84	-.83	-.87	-.84		-.86
Probability custody/conviction	.6	.41	-.63	.93		.53		.40
Average time served	.74	-.12	.53	.43		.82		.62
Robbery								
Survey rate	.91	-.69		.74	-.17	.31	-.20	.29
Recorded rate	.96	-.43	.91	.49	.93	.97	.07	.80
Convictions/1,000 offenders	-.88	.74		-.33	.77	.45		-.62
Probability custody/conviction	-.6	-.2	-.73	.81	-.10	-.90		-.92
Average time served	.92	-.13	.0	.11	.79	.23		.99

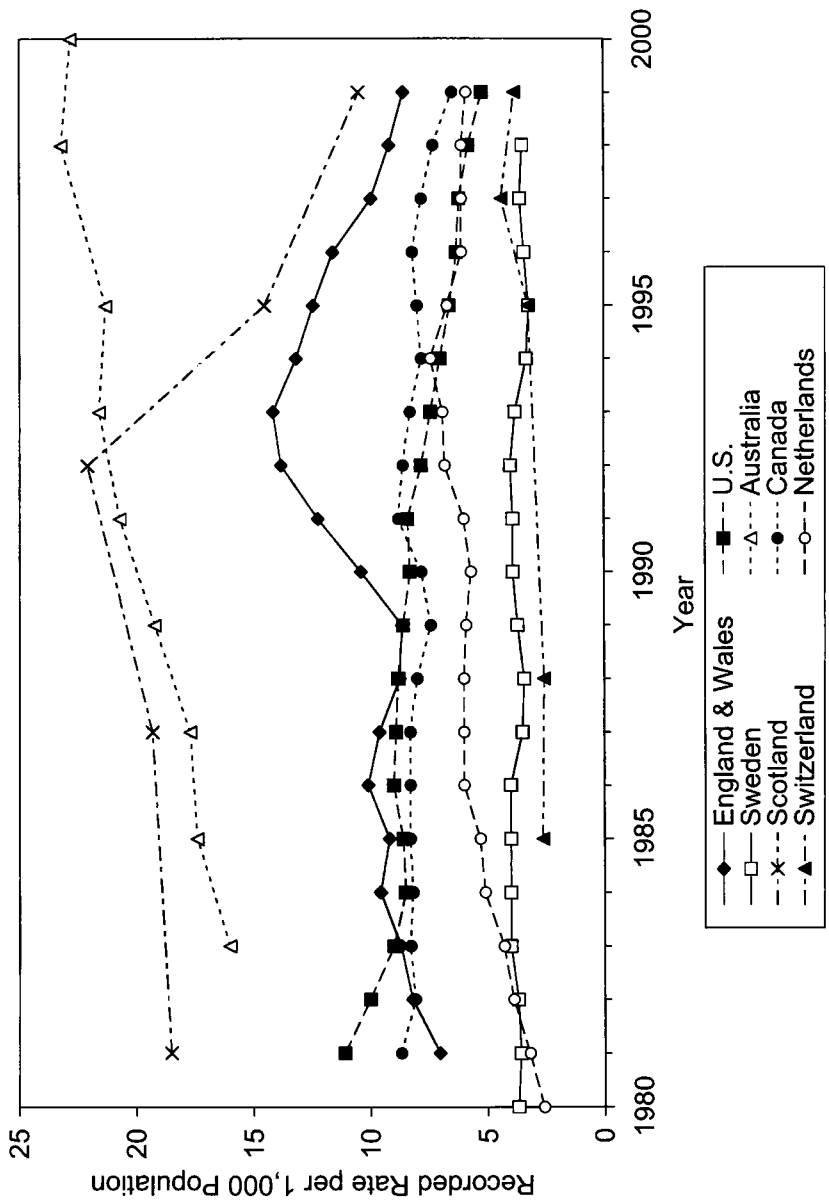


FIG. 2.—Burglary: recorded crime rate

### *B. Robbery*

Figure 3 shows the survey robbery rate. The pattern is less consistent than for burglary. The trend lines of many countries are erratic, at least partly resulting from the limited number of victim survey data points.

On average throughout the two decades, the survey robbery rate was highest in Canada and the Netherlands, and lowest in Scotland. In 1999, the survey robbery rate was lowest in the United States. It was not available for Sweden. The correlations in table 1 show that the survey robbery rate increased over time in England (0.91) and Scotland (0.74) but decreased over time in the United States (-0.69). Correlations in the other four countries were low.

Figure 4 shows the recorded robbery rate. Reported robbery rates fell during the 1990s in the United States, Canada, and Scotland, increased in England and Australia, and showed no clear trend in the other countries. On average throughout the two decades, the rate was highest in the United States (until 1998) and lowest in Switzerland. The correlations in table 1 show that over the full two decades, the rate increased in Australia (0.97), England (0.96), the Netherlands (0.93), Sweden (0.91), Switzerland (0.80), and Scotland (0.49), decreased in the United States (-0.43), and did not change in Canada (0.07).

The data summarized in this section could support a number of conclusions, some substantive and some methodological. Both survey and recorded data indicate that burglary rates fell in most countries in the latter half of the 1990s. In most countries, the trends shown by the two data sources are highly concordant, and there is little reason to doubt that burglaries became less common in most countries.

Trends are less concordant for robbery. Only in the United States and England were the survey and recorded crime rates highly correlated. According to both data sources, the robbery rate decreased in the United States and increased in England in the 1990s. The correlations in table 1 show that recorded robbery rates generally increased in most other countries (all except Canada), but, with the exception of Scotland, the survey robbery rates did not show similar increases. There was no clear trend in survey robbery rates in Australia, the Netherlands, Canada, or Switzerland.

### III. Cross-National Comparisons of Punishment

We are doubtful that available data are as yet sufficiently comparable to permit cross-national conclusions about the crime-preventive

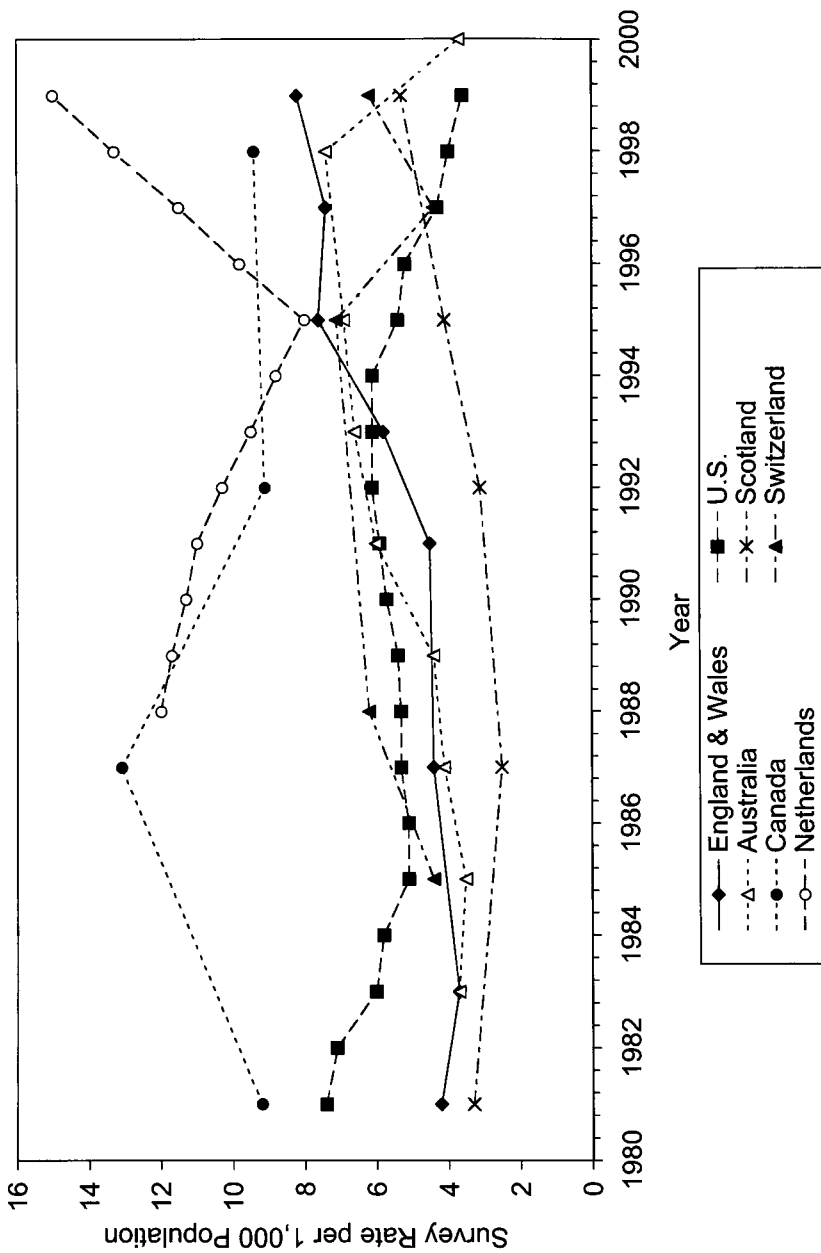


FIG. 3.—Robbery: survey crime rate

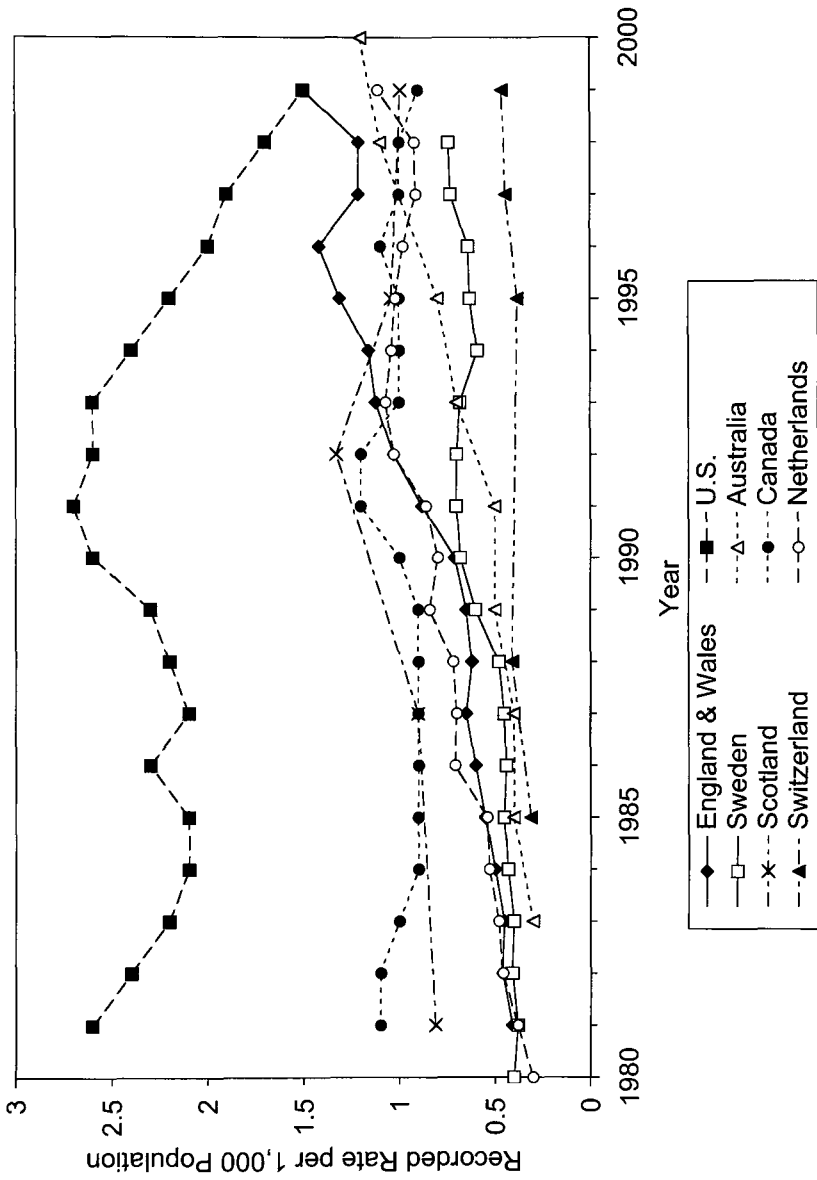


FIG. 4.—Robbery: recorded crime rate

effectiveness of penal policies to be drawn. Available data do, however, permit confident conclusions to be drawn about cross-national differences in the use and severity of punishment. We concentrate on three measures of punishment (the number of convictions per 1,000 offenders, the probability of custody following a conviction, and the average time served in custody). Crime rates may be differentially related to these different indices of risk and certainty.

#### *A. Burglary*

Figure 5 shows changes in the number of convictions per 1,000 burglary offenders as calculated from victim survey burglary rates. This is a measure of the certainty of punishment. Only in the United States did certainty in this sense increase. Canada is excluded from this figure because conviction data were not available before 1994. The number of convictions per 1,000 offenders was highest for Australia and Scotland and lowest for Sweden and England. The correlations in table 1 show that the probability of conviction per burglary decreased over time in England ( $-0.89$ ), Sweden ( $-0.84$ ), Scotland ( $-0.83$ ), the Netherlands ( $-0.87$ ), Australia ( $-0.84$ ), and Switzerland ( $-0.86$ ), but increased in the United States ( $0.82$ ).

Figure 6 shows changes in one measure of the severity of punishment, the probability of custody following a burglary conviction. This was highest in the United States and Sweden (at least until 1994) and lowest in Australia. The correlations in table 1 show that this probability increased over time in Scotland ( $0.93$ ), England ( $0.60$ ), Australia ( $0.53$ ), the United States ( $0.41$ ), and Switzerland ( $0.40$ ) but decreased over time in Sweden ( $-0.63$ ).

Figure 7 shows changes in average time served per burglary prison sentence, a measure of the severity of punishment. This was highest in the United States (until 1994) and lowest in Sweden and Scotland. The correlations in table 1 show that this increased over time in Australia ( $0.82$ ), England ( $0.74$ ), Switzerland ( $0.62$ ), Sweden ( $0.53$ ), and Scotland ( $0.43$ ) but not in the United States ( $-0.12$ ).

Table 2 shows correlations with the survey crime rate. For the burglary survey crime rate versus convictions per 1,000 offenders, the correlations were clearly negative for England and Wales ( $-0.89$ ), the United States ( $-0.86$ ), and Switzerland ( $-0.85$ ) but less clearly so for the other four countries. However, all of these correlations are limited by small numbers and by lack of control of numerous other factors that might influence crime rates over time. All we can say is that results are

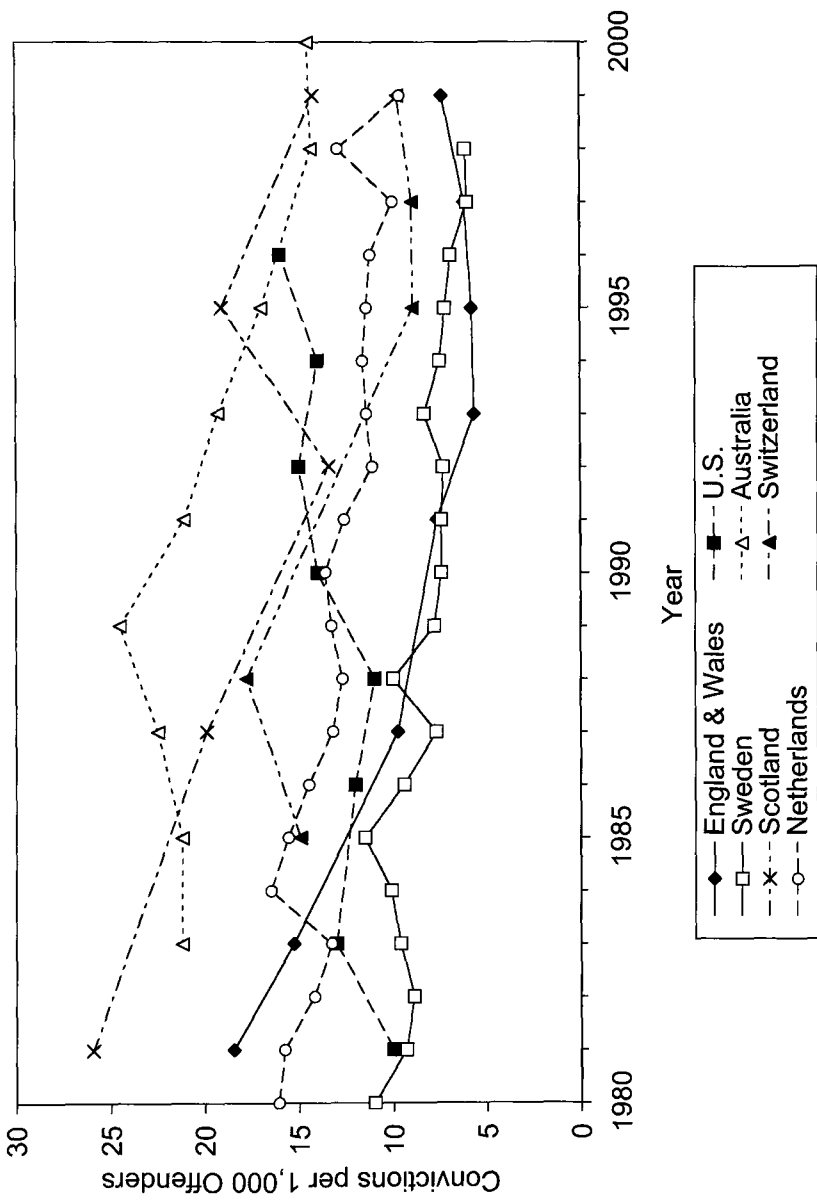


FIG. 5.—Burglary: convictions per 1,000 offenders



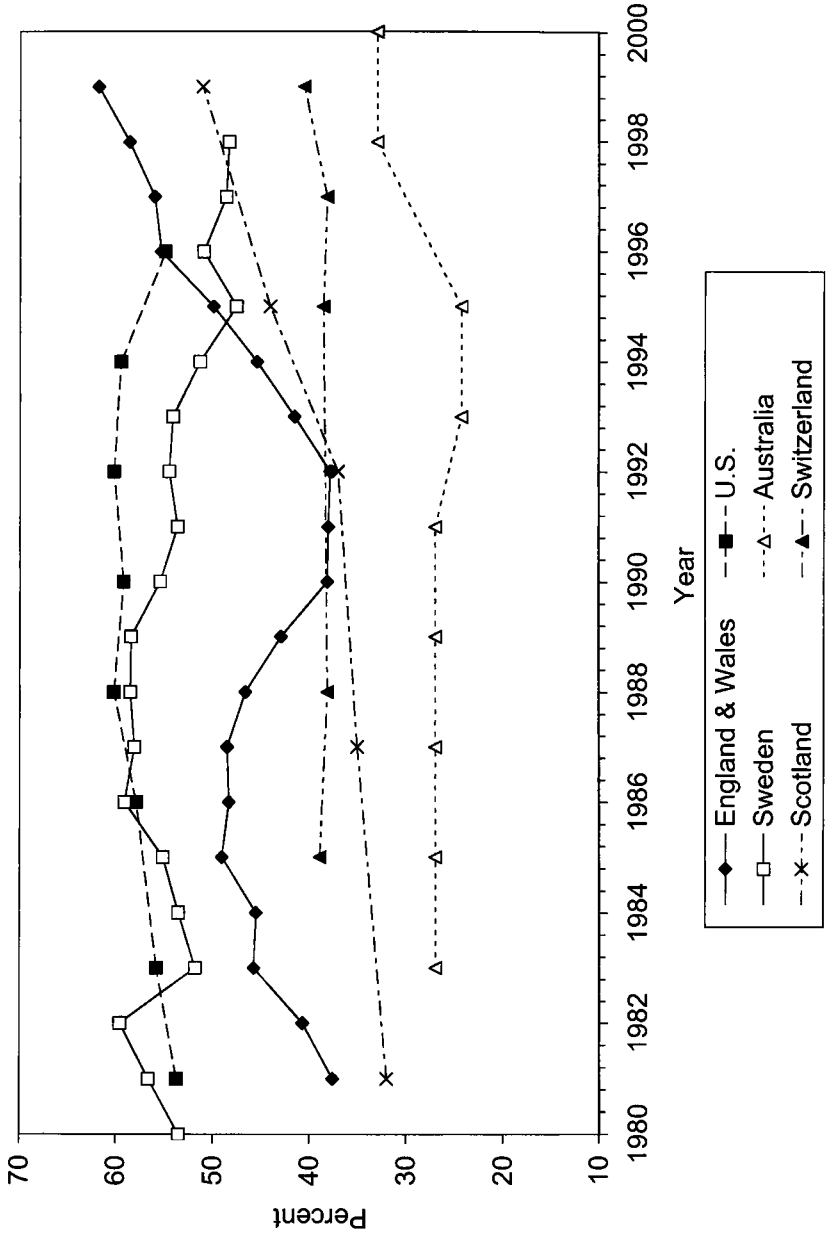


FIG. 6.—Burglary: probability of custody per conviction

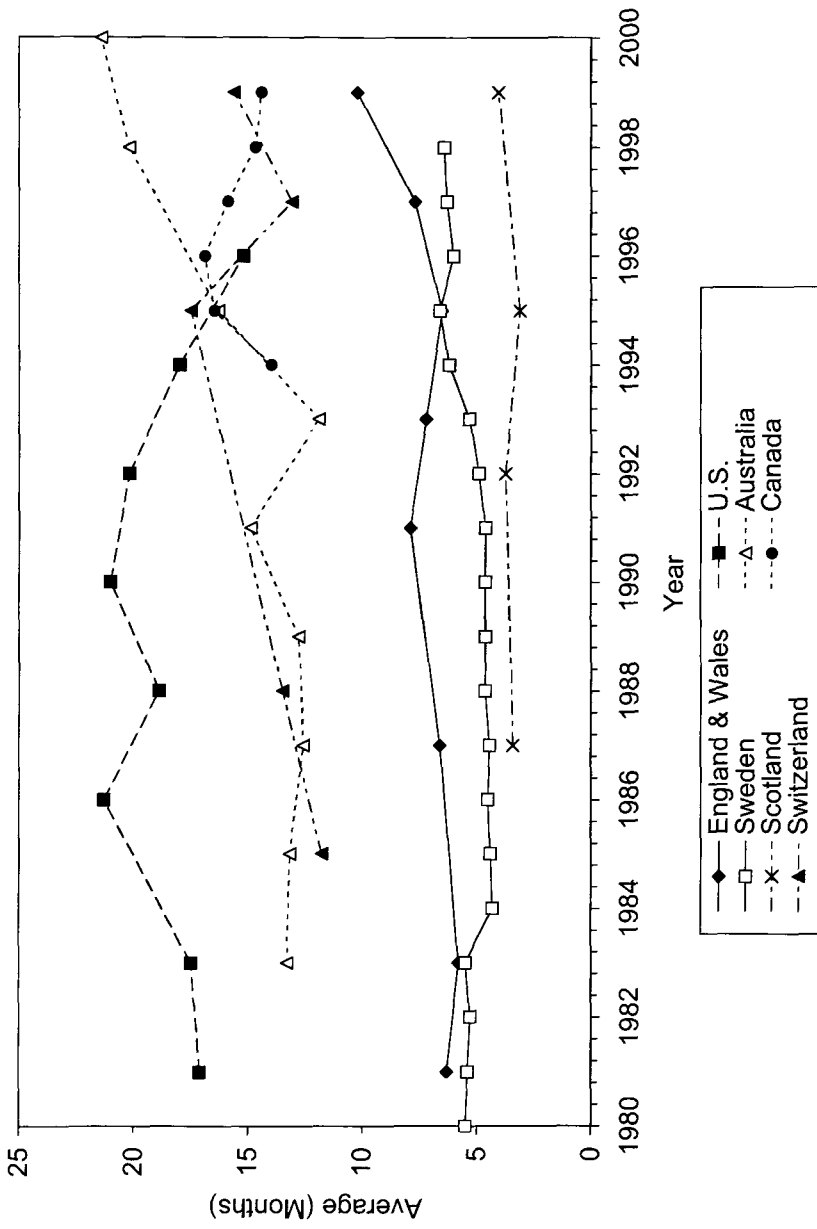


FIG. 7.—Burglary: average time served

TABLE 2  
Correlations with Survey Crime Rate

	England and Wales	United States	Sweden	Scotland	Netherlands	Australia	Canada	Switzerland
Burglary								
Recorded rate	.91	.98	.26	.74	.49	-.10	.76	.96
Convictions/1,000 offenders	-.89	-.86	-.37	-.35	-.10	-.45		-.85
Probability custody/conviction	.12	-.48	.10	-.43		.20		.03
Average time served	.10	-.01	-.01	.0		.40		.13
Robbery								
Recorded rate	.94	.81		-.01	-.34	.27	-.81	.20
Convictions/1,000 offenders	-.10	-.66		-.83	-.71	-.17		-.93
Probability custody/conviction	-.56	.17		.55	.22	-.23		-.39
Average time served	.79	-.18		-.12	-.63	.15		.34

or are not in agreement with particular hypotheses; hypotheses cannot be proved or disproved with these data. However, we can conclude that the data provide no support for some hypotheses, for example that survey burglary rates are negatively correlated with the severity of punishment; table 2 shows that correlations in five countries are close to zero and in the other country (Australia) the correlation was positive (0.40).

The survey and recorded crime rates for burglary were correlated over time in the United States (0.98), Switzerland (0.96), England (0.91), Canada (0.76), Scotland (0.74), and the Netherlands (0.49), but less so in Sweden (0.26) and not at all in Australia (-0.10). Correlations between the probability of custody following a conviction and the survey crime rate were substantial and negative only for the United States (-0.48) and Scotland (-0.43).

### *B. Robbery*

Figure 8 shows the number of convictions per 1,000 robbery offenders. This was generally high in Scotland and the United States and generally low in Switzerland and England. The correlations in table 1 show that it increased over time in the Netherlands (0.77), the United States (0.74), and Australia (0.45) and decreased over time in England (-0.88), Switzerland (-0.62), and Scotland (-0.33).

Figure 9 shows the probability of custody following a conviction for robbery. This was lowest in Switzerland and usually highest in Sweden and the United States. The correlations in table 1 show that it decreased over time in Switzerland (-0.92), Australia (-0.90), Sweden (-0.73), and England (-0.60) and increased in Scotland (0.81).

Figure 10 shows the average time served for robbery. This was highest in the United States and Australia and lowest in the Netherlands and Sweden. According to the correlations in table 1, it increased over time in Switzerland (0.99), England (0.92), and the Netherlands (0.79) but did not change markedly in the other four countries.

Table 2 shows correlations with the survey crime rate. The survey and recorded robbery rates were highly correlated in England (0.94) and the United States (0.81) but not in any other country. The negative correlation in Canada (-0.81) was based on only four years. The number of convictions per 1,000 offenders was negatively correlated with the survey robbery rate in Switzerland (-0.93), Scotland (-0.83), the Netherlands (-0.71), and the United States (-0.66), but the correlations were low in England (-0.10) and Australia (-0.17). The

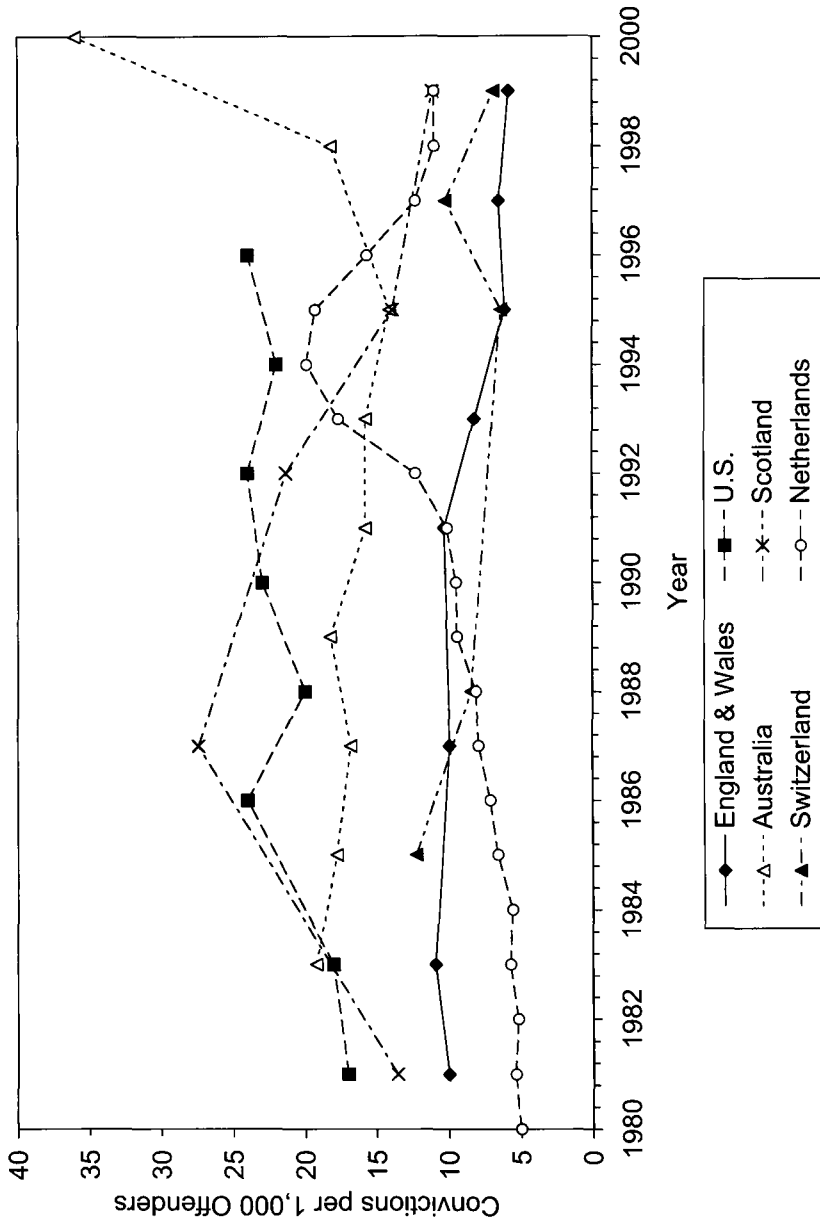


FIG. 8.—Robbery: convictions per 1,000 offenders

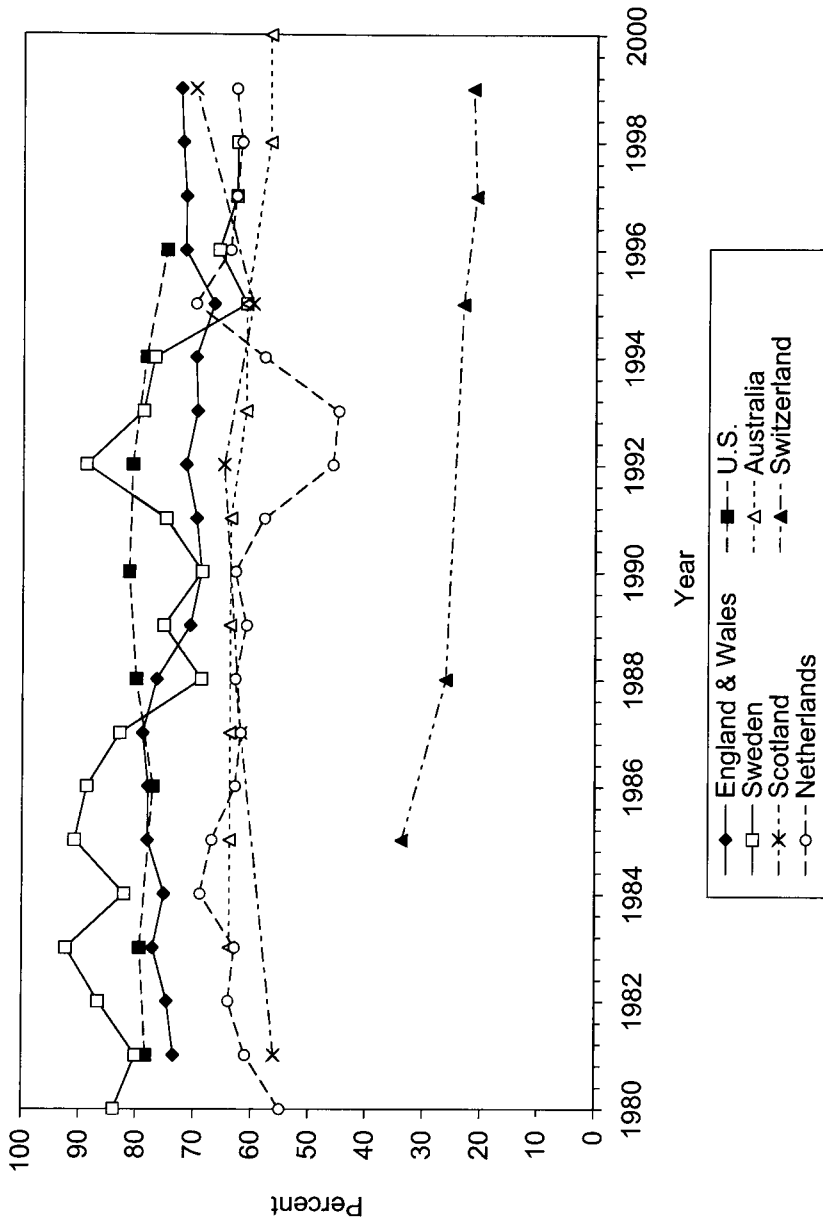


FIG. 9.—Robbery: probability of custody per conviction

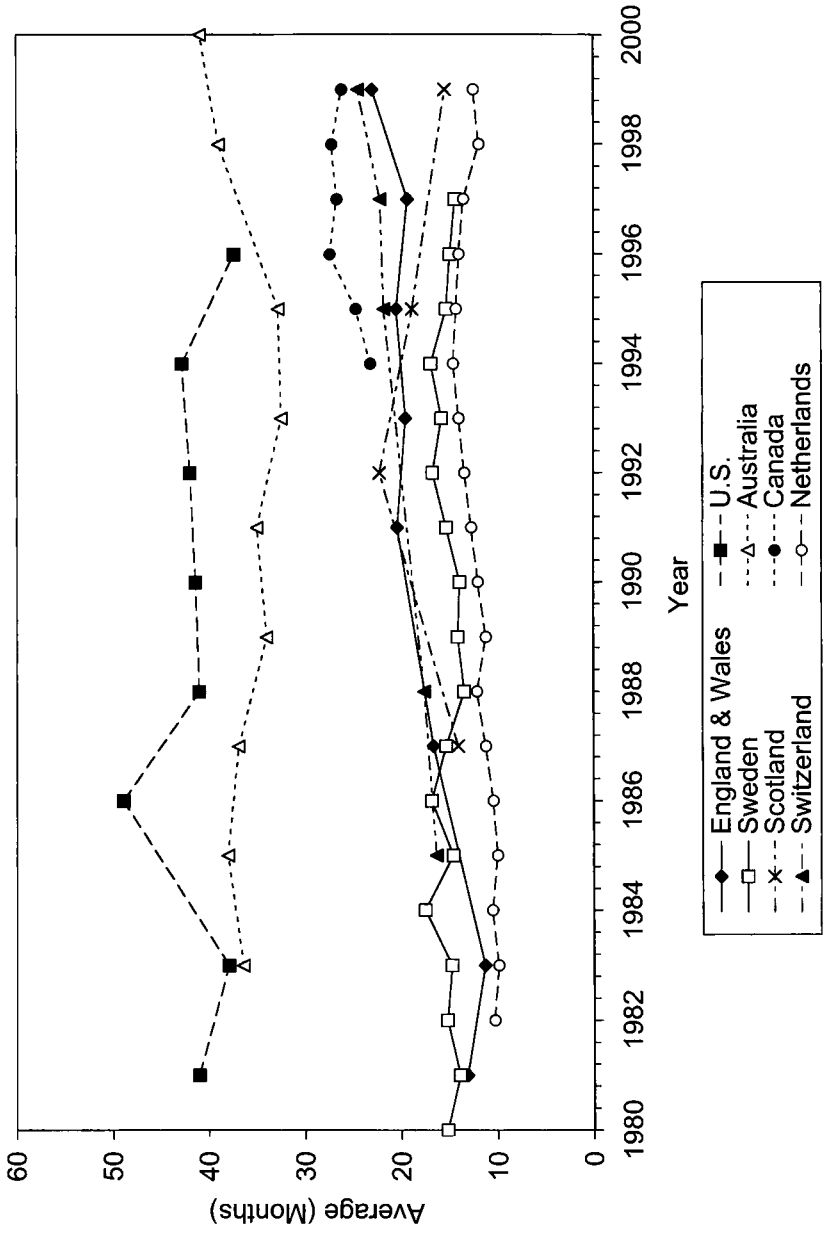


FIG. 10.—Robbery: average time served

probability of custody following a conviction for robbery was negatively correlated with the survey robbery rate only in England ( $-0.56$ ); the correlation was positive in Scotland ( $0.55$ ). The average time served for robbery was negatively correlated with the survey robbery rate only in the Netherlands ( $-0.63$ ); the correlation was positive in England ( $0.79$ ). Hence, there is no evidence that robbery rates are correlated with the severity of punishment, although in the majority of cases they were correlated with the risk of punishment.

#### IV. Advancing Cross-National Research on Crime and Punishment

A number of conclusions emerge concerning crime, punishment, and cross-national studies.

##### *A. Crime*

The data and calculations reported here generally confirm inferences that can be drawn from ICVS and sourcebook data. First, burglary rates rose considerably in the 1980s and decreased in most countries from the early 1990s on; this is shown by both victim survey and official data. Second, robbery rates in most countries showed no clear trend, but they increased in England and Scotland and decreased in the United States. Third, in each of the eight countries, homicide rates either fell substantially toward the end of the twentieth century (Australia, Canada, Switzerland, and the United States) or were essentially flat at low levels between one and two per 100,000 population. Fourth, except for Canada, where both survey and recorded rates rose, and Sweden, where there was no clear pattern, motor vehicle theft rates fell in every country during the 1990s and in several during the 1980s.

##### *B. Punishment*

Some of the conclusions that emerge relate to cross-national comparisons of “punitiveness” generally and some solely to the eight countries. First, there can be no question that the United States has the most punitive crime control practices of the countries included in this volume (and probably generally). Throughout the twenty years covered, the United States had much the highest imprisonment rate per 100,000 people. Arguments can be made that the imprisonment rate is neither the only nor the best basis for comparing punitiveness. By all the other most plausible measures—probability of commitment given a conviction, average time served of those imprisoned, or years



imprisonment per recorded crime or conviction—the United States ranks first.<sup>18</sup>

Second, during most of the period 1980–99, the probability that a burglary or a robbery would result in a court conviction fell in all the eight countries except in the United States. Those probabilities increased in the United States, which means that the increase in the U.S. imprisonment rate reflects, in addition to the factors discussed in the preceding paragraph, increased efficiency in turning crimes into convictions during a period when most of the other countries were becoming less efficient.

Third, countries vary significantly in the probability that prison sentences will be imposed. For burglary, broadly consistently throughout the twenty years, the United States, Sweden, and England imprisoned about half of convicted offenders, the Swiss and Scots about 40 percent, and the Australians about 30 percent. For robbery, also broadly consistently, the probability of imprisonment given a conviction was highest in the United States, Sweden, and England (70–80 percent) and lowest in Switzerland (around 30 percent).

Fourth, there appear to be stark differences in countries' tastes for sentence severity; average times served for burglary were two to three times longer in the United States, Australia, Switzerland, and Canada than in England, Sweden, and Scotland (see Blumstein, Tonry, and Van Ness, in this volume). Average time served for robbery was two to three times longer in the United States and Australia than in the other six countries; Canada and Switzerland, though not as severe for this offense as the United States and Australia, are at the top of the remaining six.

Fifth, countries' penal practices and punitiveness vary in ways that are misleadingly depicted by rankings in terms of the imprisonment rate per 100,000. The U.S. rate exceeding 700 per 100,000 is much the highest and results from a combination of high (and in 1980–99, increasing) chances that an offense resulted in a conviction, the highest probability of imprisonment given a conviction, and the highest average times served given a sentence of imprisonment. Sweden also had a high probability of imprisonment given a conviction but low chances an offense would result in a conviction and short average times served, resulting altogether in one of the lowest imprisonment rates among Western countries. Switzerland, by contrast, also has relatively low

<sup>18</sup> These observations are based on discussion in this essay and on the analyses and conclusions drawn in Blumstein, Tonry, and Van Ness (in this volume).

imprisonment rates per 100,000 but achieves this through a combination of moderately long average times served coupled with relatively low probabilities of imprisonment given a conviction.

### *C. Cross-National Studies*

Laborious work by many people underlies this volume. Much can be learned from such efforts, however, and the essays in this volume demonstrate that it is possible to convert information from different data systems into more or less comparable form. Possibly some of the apparent findings are artifacts of offense definitions and recording conventions, but, if so, others will discover that.<sup>19</sup>

Efforts to analyze crime and punishment patterns cross-nationally would be made easier if countries improved their data systems. To be sure, no country is going to undertake a major overhaul of its information systems in order to make researchers' lives easier, but a number of improvements that would benefit policy makers and practitioners would also benefit researchers. These include the creation of vertically integrated data systems that permit tracking of individual offenders through the criminal justice process. In federal countries, they include development of improved integration or at least comparability of information systems across state or provincial lines. For all countries they include continued professionalization to improve the accuracy, completeness, and timeliness of data reporting.

Three major next steps are within the power of researchers. First, adjustments and appropriate estimation techniques should be developed for processing national data submitted for inclusion in bureaucratic compilations of national data such as those at Interpol, the UN, and the World Health Organization. This project and the sourcebook are showing the way forward. If international compilations were based on standard definitions or reflected application of standard estimation techniques, analyses such as those in this volume would be much easier to do. Second, sample sizes in the ICVS should be increased substantially, and investments made to enable achievement of higher

<sup>19</sup> It would be odd, for example, if it is true per figs. 6 and 9, that Switzerland most years imprisons 40 percent of convicted burglars and 20 percent of convicted robbers. Selection effects are the likeliest explanation, that definitions or case-processing methods produce convicted "burglars" whose offenses are on average more serious than those elsewhere, or produce "robbers" whose offenses are on average less serious than those elsewhere, or both. In other words, counting rules in Switzerland may produce "burglars" in Switzerland who are not comparable to burglars elsewhere.

participation rates. A great strength of the ICVS is that it uses a single (though translated) instrument in all participating countries, thereby reducing inconsistencies in definitions and reporting and recording practices. Third, the present effort should be replicated and extended by others in order to improve the adjustments and estimations required to make data cross-nationally comparable, and to advance our understanding both of how countries differ in their crime patterns and penal practices and of what differences different penal practices make.

#### A P P E N D I X

##### The Template for each Country Analysis

In the versions of the country analyses published in the companion BJS publication (Farrington, Langan, and Tonry 2004), each author was asked to follow the same organization and address the same topics:

*Provide a brief description of the country and its criminal justice system*, including an impressionistic account of developments in criminal and penal policy and other relevant changes in the society between 1981 and 1999.

*Provide brief definitions of the six crimes*. Residential burglary includes attempts. Vehicle theft (including taking and driving away) includes thefts of mopeds and motorcycles; generally, attempts are excluded from victim surveys but included in police figures. Robbery includes attempts. Only serious assault is counted; generally, attempts are excluded from victim surveys but included in police figures. Rape (of females by males) is measured only in police data; attempts are included. Where figures are given only for serious sex assault, an estimate is made for rape. Homicide includes murder, manslaughter and infanticide; attempts are excluded. As far as possible, one victim equals one crime; where figures are given for incidents rather than victims (e.g., of robbery), the number of victims is estimated. Authors were asked to discuss changes since 1980 in laws that affected the six offenses, and to specify adjustments made to maximize comparability over time. Also, they were asked to specify changes in the quality of crimes over time (e.g., the percentage of robberies involving firearms) where possible.

*Specify sources of data*. Authors were asked to specify the sources of all numbers so that the data could (in principle) be replicated in the future.

*Describe victim survey data*. Authors were asked to describe the victim surveys briefly, including design, sample sizes, response rates, sampling frame and coverage, method (e.g., face to face vs. telephone), and measures to combat telescoping. Specialized victim surveys were distinguished from omnibus social surveys including victimization questions. Authors were asked to provide raw data (numbers) plus confidence intervals where possible. Residential burglary and vehicle theft rates were specified per household, and robbery and serious assault rates were specified per population covered in the survey (e.g., all those ages sixteen and over). Victim survey data on rape (and, of course, homicide) were not presented. Differences since 1980 in data collection procedures that

affect the four victim survey crimes were specified, as well as adjustments that were made to maximize comparability over time.

*Describe police data.* Authors were asked to define police-recorded crimes and to specify the precise step in processing that the crime was classified (e.g., when it is first reported). Changes since 1980 in police recording procedures that affected the six crimes were specified, as well as adjustments that were made to maximize comparability over time. Authors were asked to provide raw data (numbers) for each year and rates per population at risk.

*Estimate the probability of police recording a reported offense.* In order to estimate this, it was necessary to estimate the number of police-recorded crimes that were comparable to victim survey crimes. For burglary, comparable police-recorded crimes are residential burglaries. For vehicle theft, comparable police-recorded crimes are completed (not attempted) thefts of noncommercial vehicles. For robbery, comparable police-recorded crimes are noncommercial robberies of victims over the minimum age for the victim survey. For serious assault, comparable police-recorded crimes exclude victims under the minimum age for the victim survey. Then (formula 1):

$$B = \frac{R}{D},$$

where:

$B$  = probability of the police recording a reported crime,

$R$  = number of comparable crimes recorded by the police, and

$D$  = number of crimes reported to the police according to the victim survey.

*Estimate the average number of offenders per crime.* Authors were asked to obtain the best possible estimate of this quantity from victim surveys, police records, or self-reported offending data. If necessary, subnational data or special surveys were used. Where the estimate was robust (e.g., from police records), the raw data for each year were used. Where the estimate was less robust (e.g., victim survey reports from burglary victims, where known offenders may be a small unrepresentative fraction of all cases), this quantity was averaged over all years.

*Specify the number of convictions (i.e., persons convicted).* Authors were asked to define the meaning of a "conviction," together with the minimum ages for juvenile and adult court. Changes over time (since 1980) that affected the six crimes were specified, as well as the adjustments that were made to maximize comparability over time. Raw data (numbers) were presented for each year and rates per population at risk (e.g., those over the minimum age for conviction). Problems created by foreigners who may be in the conviction numerator but not in the population denominator were discussed.

*Estimate the number of convictions per 1,000 offenders.* This was calculated using the following equation (formula 2):

$$N = V \times O,$$

where:

$N$  = number of offenders who could in principle have been convicted (based on victim survey crimes),

$V$  = number of victim survey crimes, and

$O$  = average offenders per crime.

Where victim survey and police-recorded crimes are not comparable, it is necessary to scale up from victim survey crimes to police-recorded crimes (formula 3):

$$M = \frac{N \times P}{R},$$

where:

$M$  = number of offenders who could in principle have been convicted (based on police-recorded crimes),

$P$  = number of police-recorded crimes, and

$R$  = number of police-recorded crimes that are comparable to victim survey crimes.

The number of convictions per 1,000 offenders is estimated as follows (formula 4):

$$X = \frac{C \times 1,000}{M},$$

where:

$X$  = number of convictions per 1,000 offenders, and

$C$  = number of persons convicted.

Of course,  $X$  is not the number of convictions per 1,000 different offenders, but is the number of convictions (occasions that a person is convicted) per 1,000 times that an offender commits a crime.

*Specify the number of custodial sentences.* Authors were asked to describe definitions of custody and different types of custodial sentences available for juveniles and adults. Secure hospital orders were included as custodial sentences but suspended sentences were not. Changes since 1980 that affected the six crimes were specified, as well as adjustments that were made to maximize comparability over time. The raw number of custodial sentences each year, and rates per population at risk, were given. The probability of custody following a conviction was calculated each year. The probability of custody per offender was calculated as follows (formula 5):

$$Y = X \times S,$$

where:

$Y$  = number of custodial sentences per 1,000 offenders, and  
 $S$  = probability of custody following a conviction.

*Specify average sentence length and average time served.* Authors were asked to calculate the average sentence length and average time served per custodial sentence, for each category of crime in each year. The bases of the estimates were described. Changes since 1980 that affected the six crimes were specified, as well as adjustments that were made to maximize comparability over time.

For life sentences for homicide, the effective sentence length was estimated using the following equation (formula 6):

$$L = \frac{T}{F}.$$

where:

$L$  = effective sentence length,  
 $T$  = average time served for homicide on a life sentence, and  
 $F$  = fraction of non-life sentences for homicide that are served in custody.

The average time served per offender was calculated using the following equation (formula 7):

$$Z = \frac{Y \times D}{1.000}.$$

where:

$Z$  = average time served per offender, and  
 $D$  = average time served per custodial sentence.

Months were converted into days by multiplying by 30.44 (365.25/12).

Authors were asked to produce spreadsheets and graphs. Even if national victim survey data were available only for a limited number of years, authors were asked to present national police, conviction, and custody data for all available years. Linking probabilities (e.g., the number of convictions per 1,000 offenders) could be calculated only for years for which victim survey data were available, and so only these years were shown in spreadsheets. These are reprinted in the BJS volume by Farrington, Langan, and Tonry (2004) and are available at <http://www.ojp.usdoj.gov/bjs>.

*Summarize time trends.* Authors were asked to summarize trends over time in the following key measures:

- a) crime rates (according to victim surveys and police records);
- b) probability of reporting given a crime, probability of recording given a reported crime;

- c) conviction rates per population, and convictions per 1,000 offenders;
- d) number of custodial sentences per population, and number of custodial sentences per 1,000 offenders;
- e) average sentence length, average time served, fraction of sentence served in custody; and
- f) time served per 1,000 offenders.

Where time trends were reasonably linear, authors were asked to calculate correlations between key indicators (e.g., crime rates) and the year. It was considered that correlations would provide some indication of the magnitude of time trends. Also, authors were asked to present correlations among all survey and recorded crimes.

*Possible explanations of time trends.* Authors were asked to calculate correlations between crime rates (survey and recorded) and key national indicators such as demographic factors, unemployment rates, measures of prosperity and income disparity, and criminal justice measures such as the probability and severity of punishment, the number of police officers and the financial costs of police, courts, and prisons (in constant currency units). Of course, it was realized that it would not be possible to infer causal relationships from these correlations and that multivariate analyses were needed.

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