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*Alfred Blumstein, Michael Tonry,
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Cross-National Measures of Punitiveness

Dealing with criminal offenders is a fundamental governmental process in a democratic society. Maintenance of public safety that allows citizens to get on with their lives is a core responsibility of government. Sanctioning of offenders, whether for preventive or moral reasons, provides the paradigm case of conflict between the state's interests in pursuing collective goals and the individual's interests in preserving liberty and autonomy.

Societies vary substantially in the severity of the penalties they impose for various kinds of crimes and criminals, but it is not obvious by what metric to make such comparisons. Most such claims rely on cross-national comparisons of the average number of people held in prison per 100,000 population, but arguably equally valid measures include the number of people sent to prison per year per 100,000 population, average lengths of prison sentences, and the probability of imprisonment or average sentence length per crime committed, recorded, prosecuted, or resulting in a conviction. Results are likely to vary substantially depending on which measure is used. If average imprisonment rates in Western countries early in the twenty-first century are compared, the United States' approximately 700 per 100,000 in 2005 is much the

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highest, and those in Scandinavia, typically around sixty per 100,000, are the lowest. If annual rates of admission to prison are compared, Scandinavian rates in the 1990s were among the highest (Young and Brown 1993; Kommer 1994, 2004), but Scandinavian imprisonment rates and average sentence lengths are among the lowest.

Relative to the most common measure of national differences in punitiveness—the number of prisoners per 100,000 population—there is considerable variation among the eight nations considered in the analyses in this and the related Bureau of Justice Statistics (BJS) publication (Farrington, Langan, and Tonry 2004). In 2002, the United States had the highest incarceration rate, 686 per 100,000 (including prisoners in local jails). The seven other nations had much lower national rates in 2002 (Walmsley 2003): Sweden (68 per 100,000), Switzerland (69), Netherlands (93), Canada (102), Australia (116), Scotland (126), and England and Wales (139).

The analyses reported in this essay indicate that the high U.S. imprisonment rate results primarily from much greater lengths of prison sentence by every punitiveness measure we were able to use—years of imprisonment per recorded crime or conviction, or average sentence length given a commitment—than are imposed in other countries. The high American imprisonment rate is also partly explained by comparatively high probabilities of imprisonment given a conviction. Sweden, however, also had consistently high probabilities of imprisonment, but these were offset by the shortest average sentences of the eight countries. By contrast, Switzerland had imprisonment rates and average times served relative to recorded offenses similar to Sweden's, but these were due to low probabilities of imprisonment per recorded crime or conviction coupled with moderately severe average sentences rather than because of short sentences.

To the extent that crime rates or patterns might be affected if penalties are made more or less severe, it is important to try to learn to what extent national differences in punishment patterns affect national differences in crime. The essays published in this volume and the related BJS volume provided a potential opportunity to do that. It turned out, however, not to be possible to draw conclusions about the crime prevention or control effects of national differences in punishment practices or policies. This is partly because of the complexity of estimating these effects in even a single country with well-defined measures of crime and punishment. Efforts to estimate these effects cross-nationally are made even more difficult because of national differences in how

crimes are defined and in crime reporting and recording and changes in the latter over time.

It is also, however, as James Q. Wilson has observed, because “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 credibly (Zimring and Hawkins 1991; Whitman 2003; Tonry 2004).

It is possible, however, to draw cross-national conclusions about the comparative severity of countries’ punishment practices as measured in diverse ways (the imprisonment rate per 100,000, the probabilities of conviction or prison commitment per recorded offense, the probabilities of imprisonment per offense or per conviction, and average prison sentence lengths per offense or per commitment). We have made as many of these calculations in this essay as the available data allow.

Countries with high incarceration rates may have such high rates not simply because they send relatively more people to prison, or for relatively longer times, or both, but because they have higher crime rates. If so, the crime rate rather than punitiveness would be driving the high incarceration rate.

Alternatively, a country with a low incarceration rate per crime might have that low rate not because it is not punitive but because of its limited ability to solve its crimes and find and convict their perpetrators. Because of that possibility, it might be better to explore the magnitude of punishment per conviction.

It is also likely that some countries are highly punitive concerning some types of crime, say interpersonal violence, but much less so for other types, say property crimes. Examining this possibility calls for examination of various measures of punitiveness by crime type.

To explore these issues, we use data collected for this volume on crimes, convictions, commitments to prison, and time served for six types of crime in the eight countries. Five of these countries are English-speaking, common-law countries on three continents, and the other three are civil law countries in Europe. All are wealthy, developed Western societies with broadly similar criminal justice systems. Although there are some well-known differences between inquisitorial civil law and adversarial common law procedures, the criminal justice systems of the eight countries are much more similar than different. All

have professional police forces and established prosecutorial, judicial, and correctional systems. All afford defendants a common core of broadly similar procedural and human rights protections under relevant constitutional documents and traditions. All rely on imprisonment as the principal sanction for serious crimes (only the United States still uses capital punishment), though they vary considerably in the other punishments commonly imposed.

The biggest differences between countries for our purposes are found in the details of criminal law definitions and the organization of information systems. Countries vary widely in classification of crimes. Residential and commercial burglaries, for example, are sometimes recorded as one offense and sometimes as two separate offenses. In some places, though, there is no separate burglary offense at all, and crimes that would be counted as burglaries in the United States or England and Wales are counted under various other property offense classifications. Offense definitions and recording practices for motor vehicle crimes are another example of wide divergence. Private automobiles, commercial vehicles, and motorized two-wheeled vehicles are classified together in some places and separately in others. In some places, joyriding is not counted as motor vehicle theft, which means that those offenses that are counted are on average more serious than are motor vehicle thefts in other countries that do include joyriding.

There are also differences affecting violent offenses. Most continental European civil law countries, for example, include attempts among homicides; common-law countries do not. Concerning assaults generally and sexual assaults in particular, there are significant differences between countries in offense definitions, reporting thresholds, and recording practices. In all eight countries, including the United States (see, e.g., Blumstein and Wallman 2000), reporting and recording practices changed in the final decades of the twentieth century, reflecting reduced tolerance of violence generally and domestic and sexual violence in particular. As a result, significant components of apparent increases in assault, sexual assault, and rape in all countries probably result from changes in reporting and recording; this no doubt varies between countries.

As the introduction to this volume describes, considerable effort has been made to make the data as comparable between countries as possible by disaggregating data into subcategories, combining data into new categories, and using various estimation techniques. All such

adjustments are spelled out in the individual essays. Sometimes, however, for reasons we understand and try to explain, some data from some countries appear anomalous, and for this reason we sometimes exclude them from our analyses.

In the body of this essay, we consider criminal justice system responses to six kinds of crime: homicide, rape, robbery, residential burglary, assault, and motor vehicle theft (MVT). For each crime type, we begin with an overall measure of punitiveness as the expected time served per recorded crime.¹ This measure takes account of the operations of the entire criminal justice system. It starts with recorded crimes and average sentence lengths, thereby reflecting in aggregate the outcome of decisions by police, prosecutors, and judges. We also examine a more narrowly focused definition of punitiveness, the post-conviction expected time served per crime. Arrests and convictions are not necessarily signs of punitiveness, but committing a convicted offender to prison and specifying a particular prison term explicitly are.

We first examine these measures averaged across the countries to see the differences in how the different crime types are treated. For some crime types, one or two of the countries are significantly different from the others, and so we calculate the group averages, both with and without these “outliers.”² We then consider the country-specific measures for each crime type, which permits us to examine how countries vary in punitiveness generally and for particular crime types.

For each country and each crime type, we calculate the average values over that period for each of our parameters. Because punishment trends varied widely among the eight countries in the final two decades of the twentieth century, average values may over- or underestimate current values. In the United States and the Netherlands, for example, imprisonment rates rose continuously and sharply throughout the period,

¹ The essays on individual countries in this volume emphasize victim reports of crime. We focus on crimes recorded by the police because our emphasis is on analysis of processing within the criminal justice system, and only the recorded crimes are processed.

² In our calculations, we omitted “outliers” where they were higher than the mean of all eight countries by a factor of two or more. Since it is the high outliers rather than the low ones that distort the mean, we recalculate the means without the high outliers. Values above or below the recalculated mean (the mean without the high outliers) by a factor of two or more were recorded as “outliers.” In table 1, e.g., motor vehicle theft in the Netherlands had a value of 297.77 convictions per 1,000 crimes, well more than twice the eight-country average of 78.60 (see table 1). Hence, the Netherlands was not included in this aggregated result for MVT because it is an “outlier” by this definition.

and in England and Wales from the early 1990s onward; average sentences calculated over a twenty-year period will significantly underestimate average sentences in 1999.³ For other countries, including Sweden, Switzerland, and Canada, imprisonment rates were broadly stable, and twenty-year averages may more closely approximate current averages.⁴ Australia's imprisonment rates also were broadly stable, though rising somewhat in the late 1990s and fluctuating throughout.⁵

We also examine trends in some of the patterns of criminal justice response. Since the time series in many cases are quite erratic, we seek to identify only those trends that are both "statistically significant" (i.e., a clear trend that can be seen through the fluctuations in the time series) and "operationally significant" (i.e., trends that are sufficiently large compared to the mean of the series).⁶ Issues relating to time trends are discussed at the end of the essay.

Besides this introduction and a conclusion, this essay has four sections. Section I sets out our analytical framework and presents basic data and estimates. It then examines two measures of punitiveness: expected time served per 1,000 recorded crimes and per 1,000 convictions for each type of offense in each country. By these measures, the United States is substantially more punitive than the other countries. The Netherlands and Switzerland are the least punitive. Section II looks at probabilities of conviction and commitment per 1,000 recorded offenses. The Netherlands has the highest conviction rates per 1,000 recorded crimes and the United States and Switzerland the lowest. The Netherlands also has the highest prison commitment rates per 1,000 recorded crimes, the United States is among the highest, and Switzerland is the lowest. Section III examines average sentence lengths given a conviction. The United States is highest for all offenses except homicide (for which it is second highest), and Sweden and the Netherlands are lowest. Section IV examines national trends in prison

³ Conversely, were Finland one of the countries covered, twenty-year averages would likely overstate severity in 1999 because Finnish imprisonment rates declined substantially during that period (Lappi-Seppälä 2001).

⁴ Stable imprisonment rates do not mean that punishment patterns have not changed; the mix of offenses receiving prison sentences may have changed, as may have commitment probabilities and average sentence lengths for particular offenses.

⁵ Data on national imprisonment rates over time can be found in Kuhn (2003) and in the individual country essays in Tonry and Frase (2001).

⁶ The data may be erratic as a consequence of inherently erratic patterns, long intervals between the reporting of the measures, changes in definitions and recording practices, or large shifts in the underlying measures.

commitments and average sentence lengths given a conviction. The only country showing consistent increases in severity was England and Wales, where the probability of receiving a prison sentence significantly increased for assault and MVT and average sentence lengths increased for homicide, rape, robbery, and burglary.

I. Measuring Punitiveness

The following basic components of criminal justice processing are combined later in developing various measures of punitiveness: convictions per crime, commitments per conviction, and average time served per commitment.

The basic recorded data from which we calculate these measures are

CRIM = number of recorded crimes,

CONV = number of convictions for that crime in a year,

COM = number of persons committed to prison for that crime, and

TS = average time served by offenders committed to prison for that crime.

With only a few exceptions, CRIM, CONV, COM, and TS were available by year for the twenty years 1980 to 1999 for each crime type and for each country.⁷ With these data, we calculated three basic components to be used in various measures of punitiveness: first, convictions per crime (CONV/CRIM); second, commitments per conviction (COM/CONV); and third, time served per commitment (TS). These components are averaged over the reported years for each country and crime type. These basic components are presented in table 1 (convictions per 1,000 recorded crimes), table 2 (commitments per conviction), and table 3 (average time served per commitment). We present these tables here, even though the contents of tables 1 and 3 are presented again in somewhat different form in tables 11 and 13, because they set out basic data used in calculations in all the following tables, and we frequently refer to them to explain formulas and illustrate calculations.

A. Overall Punitiveness: Expected Time Served per 1,000 Recorded Crimes

The first measure of punitiveness is the expected time served per 1,000 recorded crimes. This broad measure encompasses the interacting effects of actions of all the functionaries who make up the criminal justice system, including police solving crimes and arresting

⁷ Not all countries had reports for every year. Australia provided data for the year 2000.

TABLE 1
Convictions per 1,000 Recorded Crimes
by Country and Crime Type

	Residential Burglary	MVT	Robbery	Assault	Rape	Homicide
England and Wales	38.05	50.69	109.41	240.26	65.14	685.34
United States	59.23	29.46	106.51	74.95	96.69	542.75
Sweden	48.58	39.27	92.55	170.97	54.42	789.84
Australia	69.68	94.71	177.36	156.18	97.97	442.74
Scotland	66.29	74.83	127.64	263.40	62.40	720.04
Canada	85.61	13.24	139.96	17.58	...	169.29
Switzerland	40.54	28.82	212.77	131.37	66.11	883.21
Netherlands	71.55	297.77	185.59	245.25	102.60	737.71
Mean of all eight	59.94	78.60	143.97	162.50	77.90	621.37

NOTE.—MVT = motor vehicle theft.

perpetrators, prosecutors securing convictions, judges sentencing people to prison, and various actors making decisions that determine how long people stay there. Postconviction actions that produce commitments and time served, more explicitly indicative of punitiveness, are considered in Section II.

This analysis allows us to characterize this measure of punitiveness by crime type and by country. It also provides an opportunity to explore explanations of national differences. Some countries might be very

TABLE 2
Probability of Commitment per Conviction
by Country and Crime Type (in percent)

	Residential Burglary	MVT	Robbery	Assault	Rape	Homicide
England and Wales	46.7	23.1	73.1	19.9	95.5	91.8
United States	57.7	51.9	78.9	61.0	81.4	94.5
Sweden	54.1	28.4	77.6	32.6	91.4	97.1
Australia	27.6	22.5	61.7	8.2	42.7	91.7
Scotland	39.8	24.4	62.6	13.2	84.7	87.1
Canada	20.0	20.0	40.0	12.0	...	76.0
Switzerland	38.8	22.3	25.1	16.6	48.8	77.2
Netherlands	66.0	44.0	61.0	10.5	77.3	92.4
Mean of all eight	43.8	29.6	60.0	21.8	74.5	88.5

NOTE.—MVT = motor vehicle theft.

TABLE 3
Average Time Served (in Months) per Conviction
by Country and Crime Type

	Residential Burglary	MVT	Robbery	Assault	Rape	Homicide
England and Wales	7.28	3.83	18.00	6.66	34.05	88.33
United States	18.65	11.94	41.60	23.40	59.78	113.63
Sweden	5.23	2.47	15.20	3.07	15.41	86.95
Australia	15.18	8.71	36.20	23.08	50.91	120.33
Scotland	3.56	2.66	17.60	7.00	36.40	94.70
Canada	15.40	3.00	25.90	27.95	...	72.39
Switzerland	14.30	9.46	20.50	10.13	25.14	46.16
Netherlands	11.40	8.10	12.14	4.91	15.80	69.20
Mean of all eight	11.38	6.27	23.39	13.28	33.93	86.42

NOTE.—MVT = motor vehicle theft.

efficient at solving crimes and convicting offenders but less aggressive than others at sending them to prison and doing so for shorter times. The factors contributing to such differences might then be explored.

We calculate the expected time served per 1,000 recorded crimes (ETS) by the following formula:

$$ETS = (1,000 \times \text{CONV}/\text{CRIM}) \times (\text{COM}/\text{CONV}) \times \text{TS}, \quad (1)$$

where:⁸

ETS = expected time served per 1,000 recorded crimes,⁹

CRIM = number of crimes of a particular type recorded annually by the police,¹⁰

CONV = number of convictions for that crime type in a year,

COM = number of persons sent to prison for that crime, and

TS = average time served by offenders sentenced for that crime.

The first factor in formula (1) represents the conviction rate per 1,000 recorded crimes, the second the commitment probability per conviction (a measure of certainty of punishment), and the third the average time served by those committed to prison (a measure of severity). Thus,

⁸ More technically, there should be a subscript under each of the terms in formula 1, where ETS_{ij} represents the expected time served for crime type "i" in country "j," and similarly for the other terms in the formula. We omit this technicality.

⁹ We use a base of 1,000 crimes simply to avoid small decimals.

¹⁰ Although victim surveys were available for all the countries, we use only crimes reported to the police and recorded by them because only those crimes find their way into the criminal justice system.

TABLE 4

Expected Time Served per 1,000 Recorded Crimes (in Months and Years) for Six Offenses, Averaged across Time and Country

	Raw Mean		Mean without High Outliers		Countries Excluded as High Outliers
	Months	Years	Months	Years	
Homicide	47,073	3,923	...	...	None
Rape*	1,936	161.3	1,500	125	United States
Robbery	1,914	159.5	1,622	135	Australia
Residential burglary	289.7	24.1	240	20	United States
Assault	313.1	26.1	205	17	United States
Motor vehicle theft	202.4	16.9	79.7	6.6	Netherlands

* No data provided for rape in Canada.

ETS/1,000 is the average time served multiplied by the probability that a crime will be followed by a conviction and a commitment to prison.

The calculation of ETS is based on the reports of CRIM, CONV, COM, and TS by year for each crime type and each country.¹¹ These results averaged over time and across the countries are summarized in table 4.

This overall measure of punitiveness across all eight countries is reasonably consistent with commonly held perceptions of the comparative seriousness of the various offenses. Homicide has the highest value, rape and robbery are next, followed by burglary and assault, with MVT the lowest. In particular, the expected time served for 1,000 murders (using the raw mean) is 47,073 months or 3,923 years, or an average of about four years per recorded murder. The expected time served per 1,000 recorded crimes is nearly twenty-five times higher for homicide than for robbery and rape; this results from the much higher likelihood (see table 1) compared with other crimes that a conviction will follow a recorded homicide and the substantially higher average time served for homicide (see table 3). Times served for rape and robbery per 1,000 recorded crimes are about equal and result from the

¹¹ Not all the countries provided all the requested data for all the years. We were able, however, to calculate average values across the reported years, and most of our analyses here are based on those averages. When there are important trends in the data that are reliably reported, we examine those trends in Section IV. Also, in some specific crime type-country combinations (e.g., rape in Canada), no data were reported.

interaction of lower conviction probabilities for rape but longer average sentences.

The similarity in times served per recorded offense could be misleading if it were not deconstructed. In most countries, the probability that a recorded rape will result in a conviction (mean: seventy-eight per 1,000) is about half that for a recorded robbery (144 per 1,000), but convicted rape defendants are more likely to be sentenced to prison (means: 75 percent compared to 60 percent) and to stay there longer (means: thirty-four months compared to 23.3 months).

Table 5 presents the analysis of ETS by country and crime type. The analysis of expected time served per crime (ETS) by individual country contributes to the aggregate estimates of ETS averaged over the countries in table 4. Comparing across countries by crime type shows that all of the countries impose severe punishments for homicide, but this is much less so concerning property crimes.

For homicide in the United States, for example, the product of a mean time served of 9.5 years (113.63 months; see table 3) multiplied by a probability of commitment per conviction (0.945; see table 2) and the probability of conviction per recorded crime (0.54275; see table 1) yields 58.57 months or an average of 4.9 years per recorded murder.¹² For another example, the expected time served for burglary in Switzerland, 0.22 months, or about seven days, is the product of a mean of 14.3 months time served (see table 3) multiplied by the probability of commitment given conviction (0.388; see table 2) and 40.54 convictions per 1,000 burglaries (see table 1). This value of ETS is so low because property crimes (MVT and burglaries) are hard to clear (only 6 percent of burglaries and 8 percent of MVTs lead to a conviction), thereby keeping the expected time served low.

Expected time served per 1,000 crimes (ETS) is reasonably consistent across the countries, in the sense that differences in time served relative to various offenses accord with widely shared views about offense seriousness, albeit with important outliers. We focus first on the high outliers because they have an important influence on the aggregate mean across the countries.¹³ The United States is the most frequent

¹² $ETS = (CONV/CRIM) \times (COM/CONV) \times TS$ or $(0.54275) \times (0.95) \times 113.63 = 58.57$ months or about 4.9 years per murder.

¹³ The Netherlands is a high outlier only for MVT, which results from a definitional anomaly in what crimes are recorded as MVT. According to Paul Smit of the Netherlands Ministry of Justice, Research, and Documentation Centre (personal communication, January 13, 2004), joyriding (temporarily stealing a vehicle for the "thrill" or for temporary transportation) is excluded from the recorded MVT crime rate.

TABLE 5
Expected Time Served (in Years) per 1,000 Recorded Crimes by Country and Crime Type

	Homicide	Rape	Robbery	Residential Burglary	Assault	MVT
England and Wales	4,631	176.5	120.0	10.8	26.5	3.7
United States	4,857	391.9	291.3	53.1	89.2	15.2
Sweden	5,551	63.8	91.0	11.5	14.3	2.3
Australia	4,071	177.5	330.1	24.4	24.6	15.5
Scotland	4,949	160.3	117.2	7.8	20.3	4.0
Canada	775	N.D.	120.8	22.0	4.9	.7
Switzerland	2,617	67.6	91.2	18.8	18.4	5.1
Netherlands	3,931	104.4	114.5	44.9	10.5	88.4
Mean of all Eight	3,923	163.1	159.5	24.1	26.1	16.9
High outliers	...	United States	Australia	United States	United States	Netherlands
Mean without high outliers	3,923	125.0	135.1	20.0	17.1	6.6
Low outliers	Canada	Sweden	...	Scotland	Canada	Sweden
Mean without low outliers*	4,372	207.1	135.1	22.0	19.1	8.7

NOTE.—MVT = motor vehicle theft. N.D. = no data provided.

* There are two steps involved in calculating the overall mean without outliers. First, we calculated the aggregate mean to determine the high outliers. As stated earlier, high outliers are values that are above the aggregate mean by a factor of two or more. Second, the aggregate mean was then recalculated without these high outliers and the low outliers were those cases that were below half this new mean.

outlier, exceeding the aggregate mean by a factor of more than two for rape, burglary, and assault. Australia is an outlier in robbery. The single offense for which there is no high outlier is the most serious crime of homicide, where ETS is reasonably consistent across the countries (with the exception of Canada, which is a low outlier).¹⁴ The United States is by this measure the most punitive country, based on its high values of expected time served per recorded crime in three crime types.

The high outliers result primarily from high values of time served. For rape, the United States and Australia have the highest values of time served and convictions per crime. Similarly, the United States has the highest time served for burglary and for assault (with the exception of Canada, which has 15.4 months, compared to 15.2 for the United States). For robbery, Australia has a high time served and a high rate of convictions per crime.

Canada is most often a low outlier, probably for the reasons of unreliability of court and corrections data sketched in note 14 and in Welsh and Irving (in this volume). Sweden is a low outlier for rape and MVT, and it is low for time served for both these offenses. Scotland is a low outlier for residential burglary because it has the lowest value of time served.

Two conclusions from table 5 stand out. One reason why the United States has the world's highest imprisonment rate is that, when sentence severity is calculated relative to recorded offenses, much harsher aggregate prison sentences (expected time served) are doled out than elsewhere. For rape, burglary, and assault, aggregate years' imprisonment per 1,000 recorded offenses is substantially higher than elsewhere; aggregate imprisonment for robbery is exceeded only by Australia, and for MVT only by the Netherlands and Australia.¹⁵ Only for homicide are aggregate U.S. imprisonment years in the mainstream.

Conversely, Sweden and Switzerland, both countries with relatively comprehensive and reliable data systems, are consistently at the low end in aggregate years' imprisonment per 1,000 recorded crimes. Except

¹⁴ Welsh and Irving (in this volume) and Brandon Welsh privately (private communication, January 18, 2005) indicate that failures in integration of provincial and national information systems for court and corrections data result in substantial undercounting of convictions and sentence durations.

¹⁵ See n. 13 regarding the Netherlands. Australia, a federal country like Canada, also has problems of poor integration of court and corrections data systems between state and federal governments, and the data in table 5 depend heavily on estimates (see Carcach, in this volume).

for homicide, for which Sweden tops the field, both countries are among the lowest for every offense.

B. Narrow Punitiveness: Expected Time Served per Conviction

The preceding section examined expected time served per 1,000 recorded crimes as an overall measure of punitiveness. A narrower measure focuses on the expected time served per 1,000 convictions. This measure is not affected by the number of convictions per recorded crime, which results from the abilities of the police to solve crimes and arrest perpetrators and prosecutors to convict. Expected time served per 1,000 convictions more narrowly reflects punishment in terms of commitment to prison and time served by those found guilty.

We calculate the expected time served per 1,000 convictions (EC) by the following formula:

$$EC = (1,000COM/CONV) \times TS. \quad (2)$$

where:

EC = expected time served per 1,000 convictions,
 CONV = number of convictions for that crime type in a year,
 COM = number of persons committed to prison for that crime, and
 TS = average time served by offenders sentenced for that crime.

The first factor in formula (2) represents the commitment probability given conviction (a measure of the risk and certainty of incarceration by those convicted; see table 2), and the second factor is the average time served by those committed to prison (a measure of the severity of punishment; see table 3). Thus, EC, the expected time served per 1,000 commitments, represents the product of the average time served by those convicted and the probability that a person convicted will be committed to prison.

The results averaged over time and across the countries are summarized in table 6. Like the broad punitiveness measure of aggregate years' imprisonment per 1,000 recorded crimes (ETS, or expected time served per 1,000 crimes), this measure also is consistent with widely shared views of the seriousness of the various crimes. Homicide has the highest value, followed by rape and robbery. Burglary and assault are comparable, and MVT is the lowest.¹⁶ The expected time served for 1,000 convictions for murder is 77,508 months or 6.459 years, or an

¹⁶ Assault is probably the crime type with the greatest range of seriousness among the convictions.

TABLE 6
 Expected Time Served per 1,000 Convictions for Six Crime Types, Averaged across Time and Country

	Raw Mean		Mean without High Outliers		Countries Excluded as High Outliers
	Months	Years	Months	Years	
	Homicide	77,508	6,459	...	
Rape*	24,611	2,051	20,611	1,718	United States**
Robbery	14,255	1,189	11,617	968	United States
Residential burglary	4,844	403.7	3,999	333	United States
Assault	3,121	260.1	1,528	127	United States
Motor vehicle theft	2,083	173.6	1,496	124	United States

* No data provided for rape in Canada.

** Outlier measure just under 2, so included as an outlier.

average of about 6.5 years per murder conviction (calculated for the raw mean). For MVT, the mean value of EC is 2.1 months. EC is a stronger indication of the societal interest in punishment for the particular crime type than ETS, since there is no discounting for the difficulty of clearing the crime, which importantly affects the measure of time served per crime.¹⁷

The United States is the only outlier in table 6 and is an outlier for all the crime types except homicide, which has no outliers.¹⁸ In contrast to the broader measure of punitiveness shown in table 4, where a number of countries show up as outliers, when this narrower measure is used, the United States is consistently high.

Table 7 provides measures of EC by crime type for each individual country. In this table, for example, the value for homicide in the United States is the product of a mean time served of 9.5 years (113.63 months; see table 3) multiplied by a probability of commitment given conviction (0.945; see table 2); this yields 107,352 months or 8,948 years per 1,000 murders, or an average of about nine years per individual murder conviction.

Table 7 highlights the degree to which the United States is the outlier in the expected time served per 1,000 convictions (EC). Aside from homicide, the United States is generally higher than the mean of all the countries by a factor of two to three and has the highest value of EC. Only Australia is higher for homicide, and not by much. The ratio of the United States to the mean of all eight countries is highest for assault with a value of 4.6.

There are a number and variety of low outliers. For motor vehicle theft, there are three low outliers (Canada, Scotland, and Sweden, all of which have values of EC in the fifties, well below the overall mean or the means without high and low outliers) for MVT. These are low outliers even when the influence of the United States, which is high by a factor of three, is eliminated.

The Netherlands, Scotland, Canada, and Switzerland are each a low outlier for two crime types: the Netherlands for rape and assault, Switzerland for rape and robbery, Scotland for burglary and MVT, and

¹⁷ Indeed, one of the important confounding factors in the analysis of ETS was potential differences across countries in the counting of the crimes. Different definitions could well affect EC also, since a country with a broader crime definition (say, including attempts as well as completions) could well display lesser punitiveness for that crime.

¹⁸ For rape, the value of EC for the United States was 1.98 times the mean of the other six countries (Canada did not report on rapes), and so round-off warranted classifying it here as an outlier.

TABLE 7
Expected Time Served (in Years) per 1,000 Convictions by Country and Crime Type

	Homicide	Rape	Robbery	Residential Burglary	Assault	MVT
England and Wales	6,757	2,709	1,097	283.3	110.4	73.6
United States	8,948	4,053	2,735	896.4	1,189.5	515.9
Sweden	7,028	1,173	983	235.9	83.4	58.4
Australia	9,195	1,812	1,861	349.5	157.7	163.5
Scotland	6,874	2,569	918	118.1	77.0	54.1
Canada	4,578	N.D.	863	256.7	279.5	50.0
Switzerland	2,963	1,023	437	462.6	140.1	176.1
Netherlands	5,328	1,017	617	627.0	43.0	297.0
Mean of all eight	6,459	2,051	1,189	403.7	260.1	173.6
High outliers	...	United States	United States	United States	United States	United States
Mean without high outliers	6,459	1,718	968	333.3	127.3	124.7
Low outliers	Canada	Netherlands Switzerland	Switzerland	Scotland	Netherlands	Sweden Scotland Canada
Mean without low outliers	6,958	2,463	1,057	369.2	141.4	177.6

NOTE.—MVT = motor vehicle theft. N.D. = no data provided.

Canada for homicide and MVT. Thus, the Netherlands and Switzerland seem to be relatively less severe for the violent crimes, Scotland for the property crimes, and Canada for both the most and least serious of the crime types.

II. Certainty of Punishment

Expected time served measures reflect the strong influence of severity of punishment (sentence length). For both theoretical and practical reasons, it is important also to look at certainty of punishment. "Certainty" is typically measured as the probability that incarceration will be imposed, and "severity" is measured by the duration of the prison sentence, or time served. The previous section combined these two aspects of punishment. They can be disentangled by looking at commitments per 1,000 recorded offenses as a measure of the certainty of punishment, leaving aside the issue of severity. This section looks at commitments per 1,000 crimes recorded by the police and then per 1,000 convictions. Dropping time served from the formula for expected time served per offense (formula [1]) provides a measure of the rate of commitment to prison per 1,000 crimes. This rate is based on the product of the probability that a crime will lead to a conviction (reflecting police and prosecutorial effectiveness in producing convictions) and the probability that the conviction leads to a prison commitment by the judge. Thus, we can calculate the certainty of incarceration (CER) as

$$\text{CER} = (1.000\text{CONV}/\text{CRIM}) \times (\text{COM}/\text{CONV}), \quad (3)$$

where:

CER = rate of commitment per 1,000 crimes (i.e., certainty of incarceration),

CRIM = number of crimes of a particular type recorded by the police in each country,

CONV = number of convictions for that crime type in a year, and

COM = number of persons committed to prison for that crime.

A. Commitments per 1,000 Recorded Crimes

The measures of certainty of punishment, CER, are displayed in table 8 by crime type averaged over time and country. Certainty of punishment is by far the highest for homicide, both because suspects are more often identified and because convictions are very likely to lead to imprisonment. Robbery and rape are next highest, but lower than

TABLE 8
Commitments per 1,000 Recorded Crimes for Six Crime Types,
Averaged across Time and Country

	Raw Mean	Mean without High Outliers	Countries Excluded as High Outliers
Homicide	554.3	...	...
Rape*	56.7	...	...
Robbery	81.0	...	...
Residential burglary	25.5	...	...
Assault	30.8	...	...
Motor vehicle theft	27.2	12.4	Netherlands

* No data provided for rape in Canada.

homicide by a factor of between seven and ten. The other crimes are of still lesser seriousness, but are plausibly ordered as assault, residential burglary, and motor vehicle theft.

There are no high outliers here other than the Netherlands, which has an anomalous rate of convictions for MVT, probably because of definitional differences that excluded joyriding from the count of MVT.

The country-specific analyses are shown in table 9. Here again, there is only one outlier, Canada, which is very much a low outlier for homicide (one-fourth the aggregate mean) and assault (one-fourteenth the aggregate mean). Canada is also a low outlier for MVT, about one-quarter the aggregate mean without the Netherlands. Most likely the Canadian outliers are the result of data problems rather than nominal commitment rates that are facially implausible.

Setting aside Canada generally and the anomalous Netherlands MVT sentencing, the commitment rates per 1,000 crimes (CER) are much more consistent across the countries. Two findings stand out. First, the United States, though consistently in the upper half of commitment probabilities, is not the highest for any offense in commitments per 1,000 recorded crimes and, by this measure, is not demonstrably more punitive than other Western countries. Second, Switzerland conspicuously is the most parsimonious user of prison commitments, with the lowest rates for rape, robbery, and burglary, and among the lowest for assault and MVT.¹⁹

¹⁹ If the seemingly anomalous Canadian data are disregarded, Switzerland is also lowest for MVT and second lowest for assault.

TABLE 9
Commitment Rates per 1,000 Recorded Crime Types
by Country and Crime Type

	Homicide	Rape	Robbery	Residential Burglary	Assault	MVT
England and Wales	629.1	62.2	80.0	17.8	47.8	11.7
United States	512.9	78.7	84.0	34.2	45.7	15.3
Sweden	766.9	49.7	71.8	26.3	55.7	11.1
Australia	406.0	41.8	109.4	19.3	12.8	21.3
Scotland	627.2	52.9	79.9	26.4	34.8	18.3
Canada	128.7	N.D.	56.0	17.1	2.1	2.7
Switzerland	681.8	32.3	53.4	15.7	21.8	6.4
Netherlands	681.7	79.3	113.2	47.2	25.8	131.0
Mean of all eight	554.3	56.7	81.0	25.5	30.8	27.2
High outlier	...	...	...	...	...	Netherlands
Mean without high outliers	...	...	...	...	...	12.4
Low outliers	Canada	...	...	...	Canada	Canada
Mean without low outliers	615.1	...	...	...	34.9	14.0

NOTE.—MVT = motor vehicle theft. N.D. = no data provided.

B. Convictions per 1,000 Recorded Crimes

Even without a commitment to prison, convictions entail punishment. Part of it is intangible and consists of the stigma associated with a conviction and others' reactions to it. Many convictions, however, involve restrictions on freedom of liberty and autonomy associated with probation, community service, or risks of being sent to prison for violations of conditions of community penalties.

To address this more limited aspect of certainty, we calculate the conviction rate (CONVR) by the following formula:

$$\text{CONVR} = (1,000\text{CONV}/\text{CRIM}), \quad (4)$$

where:

CONVR = convictions per 1,000 crimes (i.e., certainty of conviction),
CRIM = number of crimes of a particular type recorded by the police, and
CONV = number of convictions for that crime in a year.

This conviction rate, CONVR, is the risk of conviction faced by someone who commits a crime that gets recorded by the police. Table 10

TABLE 10

Convictions per 1,000 Recorded Crimes for Six Crime Types,
Averaged across Time and Country

	Raw Mean	Mean without High Outliers	Countries Excluded as High Outliers
Homicide	621.4	...	...
Rape*	77.9	...	...
Robbery	144.0	...	...
Residential burglary	59.9	...	...
Assault	162.5	...	...
Motor vehicle theft	78.6	47.3	Netherlands

* No data provided for rape in Canada.

presents the aggregate raw mean averaged over all countries. There was only one high outlier, the Netherlands, for motor vehicle theft. The risk of conviction is by far the highest for homicide; there are often likely suspects. The violent crimes of robbery and assault are next highest, but lower than homicide by a factor of about four; these crimes involve face-to-face confrontations, so identification of offenders is easier than for typically more anonymous property crimes. The other violent crime of rape is lower than these by an additional factor of two. The property crimes are the lowest, largely because of the difficulty of identifying perpetrators.

Table 11 displays conviction rates by crime type and country. As with commitment rates, Canada is a low outlier in conviction rates for several crimes, which we attribute to the unreliability of the Canadian data. The United States and Sweden, an odd couple given that they hold top and bottom rankings for prison sentence lengths given a conviction, both appear to be significantly less efficient in securing convictions than are other countries.²⁰ Both are below the means in conviction rate for at least four of six offenses. Otherwise there are no distinctive patterns for particular countries.

C. Commitments per Conviction

A third measure of certainty is the probability of commitment given a conviction. Like the expected time served per conviction, this is a

²⁰ The United States somewhat unexpectedly is a low outlier in assault. This is probably a consequence of reclassification of domestic assaults as "aggravated" at the time of arrest, and these rarely end up being prosecuted as assaults, leading to a low ratio of convictions per recorded crime (see Blumstein and Beck 1999).

TABLE 11
Convictions per 1,000 Recorded Crimes by Country and Crime Type

	Homicide	Rape	Robbery	Residential Burglary	Assault	MVT
England and Wales	685.3	65.1	109.4	38.1	240.3	50.7
United States	542.8	96.7	106.5	59.2	75.0	29.5
Sweden	789.8	54.4	92.6	48.6	171.0	39.3
Australia	442.7	98.0	177.4	69.7	156.2	94.7
Scotland	720.0	62.4	127.6	66.3	263.4	74.8
Canada	169.3	N.D.	140.0	85.6	17.6	13.2
Switzerland	883.2	66.1	212.8	40.5	131.4	28.8
Netherlands	737.7	102.6	185.6	71.6	245.3	297.8
Mean of all eight	621.4	77.9	144.0	59.9	162.5	78.6
High outlier	...	...	...	...	...	Netherlands
Mean without high outlier	...	...	...	...	...	47.3
Low outlier	Canada	...	...	...	Canada/United States	Canada
Mean without low outliers	685.9	...	...	...	201.2	53.0

NOTE.—N.D. = no data provided.

TABLE 12

Average Time Served (in Months and Years) for Six Crime Types,
Averaged across Time and Country

	Raw Mean		Mean without High Outliers (Months)	Countries Excluded as High Outliers
	Months	Years		
Homicide	86.4	7.2	...	...
Rape*	33.9	2.8	...	...
Robbery	23.4	2.0	...	...
Residential burglary	11.4	...	...	...
Assault	13.3	1.1	11.2	Canada
Motor vehicle theft	6.3	...	...	...

* No data provided for rape in Canada.

more direct measure of punitiveness than convictions or commitments per offense because it ignores variations in clearance and conviction.

Commitments per conviction are presented in table 2. There is striking consistency in these measures. Since these values are inherently constrained to be less than 100 percent, and the aggregate means for three crime types are over 50 percent, there cannot be high outliers. Of the other three, burglary (44 percent) and MVT and assault (both in the twenties) do not generate high outliers. There are some low outliers (burglary in Canada, robbery in Switzerland, and assault in Australia), but no consistent pattern emerges that justifies discussion.

III. Severity of Punishment: Time Served

The typical indicator of severity of punishment is the average time served by those committed to prison, with longer time served indicating more severe punishment. All the uncertainty about clearance of a crime through arrest, uncertainty of conviction, and even the discretion associated with a decision to commit to prison is eliminated. The focus here is on those sent to prison and how long they spend there. The results for severity of punishment are reported in table 12 for averages across all countries and in table 13 for the country-specific values (which are basically drawn from table 3).

Severity of punishment is certainly consistent with the relative seriousness of the offenses—highest for homicide, next for rape, then robbery, then for assault and residential burglary, and lowest for MVT. The striking observation from table 13 is the consistency with which Sweden is a low outlier for four offenses—rape, residential burglary,

TABLE 13
Average Time Served (in Months) by Country and Crime Type

	Homicide	Rape	Robbery	Residential Burglary	Assault	MVT
England and Wales	88.33	34.05	18.00	7.28	6.66	3.83
United States	113.63	59.78	41.60	18.65	23.40	11.94
Sweden	86.95	15.41	15.20	5.23	3.07	2.47
Australia	120.33	50.91	36.20	15.18	23.08	8.71
Scotland	94.70	36.40	17.60	3.56	7.00	2.66
Canada	72.39	N.D.	25.90	15.40	27.95	3.00
Switzerland	+6.16	25.14	20.50	14.30	10.13	9.46
Netherlands	69.20	15.80	12.14	11.40	4.91	8.10
Mean of all eight	86.42	33.93	23.39	11.38	13.28	6.27
High outlier	...	...	...	...	Canada	...
Mean without high outlier	...	...	...	...	11.20	...
Low outlier	...	Sweden Netherlands	...	Sweden Scotland	Sweden Netherlands	Sweden Scotland Canada
Mean without low outliers	...	41.30	...	13.70	14.10	8.40

NOTE.—MVT = motor vehicle theft. N.D. = no data provided.

assault, and MVT.²¹ Sweden imposes relatively short sentences, moving offenders relatively quickly out of prison back into the community. Scotland and the Netherlands are low outliers in two crime types each, Scotland for the property crimes of MVT and burglary, and the Netherlands for the personal crimes of rape and assault. For the more serious crimes of homicide and robbery, there are no outliers, and there is substantial consistency across the countries.

IV. Trends in Punitiveness

So far, we have ignored time trends, presenting averages over time for each crime type in each country. In this section we focus briefly on trends in punitiveness,²² focusing on the certainty and severity of punishment. We measure certainty by the rate of commitments per conviction and severity by time served.

We assess the time trend by an annual “trend ratio.” This is the time regression coefficient over the period 1980–99 divided by the mean of the time series.²³ Positive (or negative) trend ratios equal to or greater than 2 percent change per year that were statistically significant were taken as evidence of an upward (or downward) trend. Trend ratios less than 2 percent were interpreted as evidence of stability.

A. Certainty of Punishment: Probability of Commitment per Conviction

The analysis of trends in certainty of commitment per conviction is displayed in table 14 by crime type and country. The dominant pattern is more one of stability than of consistent trends. The crime type with the most consistent trend is MVT with an upward trend in three countries (England and Wales, Scotland, and Australia). One country,

²¹ There are three low outliers for MVT. This is largely a consequence of the bimodality of the sentence distribution. Four countries (United States, Switzerland, Australia, and Netherlands) are at the high end, with a mean of 9.55 months, and the other four countries (England and Wales, Scotland, Sweden, and Canada) are at the low end, with a mean of 2.99 months. Thus, the outliers are more interesting for identifying those at the low end of the distribution (England and Wales just missing the cut-point of the outlier criterion) than for suggesting they are anomalous.

²² Some countries used the same figure year after year as the time served, thereby precluding any meaningful trend analysis; thus, we did not include such repetitive estimates in our analysis. Furthermore, it is difficult to detect long-term trends that may exist within a country if only a few years of data were submitted. This could be the case with Canada for burglary and Scotland for robbery.

²³ Concerning the time regression coefficient, if Y is the measure of concern, then in the regression formula, $Y = a + bt$, the estimated value of b is the relevant time regression coefficient.

TABLE 14
Trend Ratios (Trend Coefficient/Mean Value), Commitments per Conviction by Crime Type

	Rape	Trend	Robbery	Trend	Burglary	Trend	Assault	Trend	MVT	Trend
England and Wales	.1**		.6**		1.5*		4**		2.3*	Up
United States	.4**		.2		0		.2		.8	
Sweden	.3		1.8**		.9**		.1		-.2	
Australia	...		.9*		1.3		0		2.2**	Up
Scotland	.6		.8		3.4*	Up	1.3		3.5*	Up
Canada	...		...		...		...		...
Switzerland	2.5		-1.8*		.4		.8		.8	
Netherlands	-1.7**		.4		...		3.0*	Up	...	

NOTE. Countries with the same entry for every year were not included. A trend of "up" or "down" is noted when the trend ratio exceeds 2 percent per year and is statistically significant at least at a 5 percent level of confidence. In this table, there were no "down" trends. MV/T = motor vehicle theft.

* $p < .05$ (two-tailed).

** $p < .01$ (two-tailed).

Scotland, has an upward trend in burglary, and two, England and Wales and the Netherlands, in assault. We do not include homicide in table 14 because the probability of custody per conviction is consistently high everywhere, and trends would be difficult to identify.

Across countries, the trends are most consistent in England and Wales, with two upward trends in assault and MVT. Scotland had upward trends in burglary and MVT. Perhaps because of its large value in the denominator of the trend ratio, the United States was the only country to display no trends over this period.

B. Severity of Punishment: Time Served

Table 15 presents trends in time served by country and by crime type. Trends in time served vary with the seriousness of the offense. In light of growing international concern about violent offenses, an upward trend in average time served for the violent offenses might be expected. Indeed, though table 15 does not identify many trends in average time served, the few trends apparent were more often upward and more often associated with violent offenses. The trend was upward in England and Wales for homicide and rape, for homicide in Switzerland, and for rape in the Netherlands. Time served was also up for robbery and burglary in England and Wales and for homicide and robbery in Switzerland. England and Wales displayed the most consistent upward trend in four of the six offenses, with Switzerland showing an upward trend in two offenses. Motor vehicle theft and assault displayed no trends.

V. Conclusions

There have been few serious efforts cross-nationally to compare punishment practices and policies generally or the severity of punishment in particular. Well-known impediments of variations in institutional arrangements and procedures, in criminal law definitions, and in the comprehensiveness and reliability of data systems explain why. The project of which this volume is a part has tried to address and to minimize those difficulties, and some interesting conclusions or, more modestly, hypotheses, can be drawn from the analyses set out in this essay. First, in general, there are more similarities than differences in how countries responded to the various kinds of crimes. "Punitiveness," variously measured, was consistent with widely shared views about the comparative seriousness of crimes and, in most cases, broadly similar across countries. There were often, however, "outliers" that deviated from the group norms, but usually there was only one high outlier and

TABLE 15

Trend Ratios (Trend Coefficient/Mean Value) in Average Time Served by Crime Type by Country

	Hom.	Trend	Rape	Trend	Rob.	Trend	Burg.	Trend	Assault	Trend	MVT	Trend
England and Wales	3.4**	Up	5.5**	Up	3.3**	Up	2.6*	Up	1.1		-1.1	
United States	1.6**		2.1		-.4		-1.0		-.6		-1.3	
Sweden	1.2**		1.4		.1		1.7**		1.1*		1.5*	
Australia	.8		1.6*		.5		3.9**	Up	.4		-1.2	
Scotland	.9		4.8		-5.4**	Down	1.5		3.6		-1.3	
Canada	2.3		...		1.1		-4.2**	Down	0		...	
Switzerland	6.6*	Up	3.3		2.9**	Up	.9		3.1		2.0	
Netherlands	-2.4		3.7**	Up	1.9**		...		1.0*		...	

Note.—No data provided for rape in Canada. A trend of "up" or "down" is noted when the trend ratio exceeds 2 percent per year and is statistically significant at least at a 5 percent level of confidence. Hom. = homicide. Rob. = robbery. Burg. = burglary. MVT = motor vehicle theft.

* $p < .05$ (two-tailed).

** $p < .01$ (two-tailed).

sometimes a low outlier. Even in those cases, the outliers seemed likelier to result from definitional and data problems than from real differences.

The analyses showed that inferences drawn from incarceration rate comparisons that the United States is the most punitive country in the world can be supported by data on average time served relative to recorded crimes, convictions, and average sentence lengths. The United States was the most punitive country for nearly all the crime types, especially when punitiveness is defined narrowly as expected time served per conviction.

Depending on the punitiveness measure used, Sweden and Switzerland are the least punitive countries, though their dynamics differ. The Swedes use imprisonment often but for short terms and the Swiss use prison comparatively seldom but for longer terms. It has been the announced policy of the Swedish criminal justice system to limit the duration of prison sentences, and the effect of that policy is demonstrated in the time-served analysis. The Swiss have been creative in the use of community penalties and appear to be diverting a large fraction of less serious offenders and imposing relatively longer prison sentences on the more serious offenders not diverted.

The analyses in this essay have been based on the time average over the twenty years of each of the parameters characterizing criminal justice processing in each of the eight countries being examined. A separate examination of time trends suggests that there have been a limited number of strong trends in various aspects of punitiveness. These have occurred more often in severity of punishment than in its certainty, and primarily in the violent offenses. Only one country, England and Wales, appears to have increased punitiveness markedly over time, more for severity than for certainty.

The conclusions drawn here are necessarily tentative, but they illustrate that such analyses are possible and that they can be improved as techniques for standardizing and calibrating data across national boundaries improve. The main conclusions, that the United States by multiple measures is substantially more punitive than other Western countries, that, for different reasons, the Swiss and the Swedes are among the least punitive, and that England and Wales is rapidly moving in an American direction are not in themselves very surprising, but they are more firmly bedded in data than such conclusions usually are.

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