POLICY ESSAY

Explaining the rise in U.S. incarceration rates*

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By all measures, the United States currently incarcerates its residents at an exceptionally high rate. Aggregating the state and federal prison populations as well as inmates in local jails, there were 737 inmates per 100,000 U.S. residents in 2005 (International Centre for Prison Studies, 2007). This number compares with a world average of 166 per 100,000 and with an average among European Union member states of 135. Of the approximately 2.1 million U.S. residents incarcerated in 2005, roughly 65% were inmates in state and federal prisons, whereas the remaining 35% resided in local jails.

Moreover, current U.S. incarceration rates are unusually high relative to historical figures for the United States itself. For the 50-year period spanning the 1920s through the mid-1970s, the number of state and federal prisoners per 100,000 varied within a 10-unit to 20-unit band around a rate of approximately 110. Beginning in the mid-1970s, however, state prison populations grew at an unprecedented rate, nearly quadrupling between the mid-1970s and the present. Concurrently, the rate of incarceration in local jails more than tripled.

In this excellent article, Spelman (2009, this issue) provides an econometric analysis of the growth in the U.S. prison population from 1977 through 2005. The article first presents a model of the optimal prison population. The author hypothesizes the existence of a marginal benefit function that declines with the incarceration rate. This inverse relationship is driven by the highly plausible proposition that as the incarceration rate increases, the criminality of the marginal inmate likely declines leading to declining incapacitation and deterrence effects and, in turn, to marginal benefits. Marginal costs are assumed to increase in the incarceration rate because as incarceration expands, resources less suited for corrections are

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diverted toward this sector, as well as because of the increasing opportunity costs of alternative social investments (or tax relief). The social optimum occurs when the marginal benefit generated by the last prison year served just merits the incurred social costs.

From this starting point, Spelman (2009) then notes that actual adjustment to the incarceration rate does not occur instantaneously but with a dynamic lag. That being said, any shifts in the determinants of the benefits for prisons (higher crime, a greater taste for retributive justice, etc.) or the costs of incarceration (construction costs, benefits from alternative investments, etc.) may not be realized until several years after such changes are implemented. This reasoning leads the author to a dynamic regression analysis of the determinants of prison population growth.

What is perhaps most novel about the current analysis is Spelman’s (2009) hypothesis that capital expenditures play an important mediating role in incarceration growth. Although demand for capital expenditures for prisons may be driven by some of the same underlying determinants of prison demand, state income constraints (associated with income growth and growing state tax revenue) may also play an independent role. In the language of microeconomic analysis, state and national income growth may lead to increased demand on the part of the public for all normal goods. To the extent that public safety is such a good, and that increasing incarceration is an effective mechanism for realizing an income-induced shift in demand, income growth alone will have a direct effect on incarceration growth, and may in itself be an important part of the story of the last 30-plus years.

Spelman (2009) presents several pieces of evidence to support this hypothesis. First, in simple comparisons with capital expenditures in other social domains, the increase in capital corrections expenditures does not seem all that unusual. Second, in the formal econometric analysis, several measures of total state spending are found to exert significant effects on capital expenditures. Moreover, along with variation in crime rates, these state expenditures explain a fair portion of the explainable variance in prison growth. Based on these findings—and on a decomposition of the explained variation in the models—the author concludes that growth in state spending, variation in crime, and to a lesser degree, policy choices and politics are behind the increases in incarceration rates.

Although I certainly find credible the hypothesis that greater resources may indeed have partially fueled incarceration growth and that higher crime leads to higher incarceration rates, I believe that the current empirical exercise is likely to overstate the importance of these factors, while understating the role of sentencing policy and, perhaps, the shifting politics behind such policy changes. The reasons driving me to these conclusions are several. First, gauging variation in sentencing severity
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along its various dimensions in a manner suitable for multivariate analysis is immensely difficult, given the great heterogeneity in the de facto sentencing regimes across states, and the fact that even states with similar provisions (e.g., truth-in-sentencing provisions or sentencing commissions) vary greatly in the implementation of these provisions. Second, during other periods in U.S. history, economic growth rates have also exceeded those of the period corresponding with the current prison boom; yet we did not experience an increase in incarceration rates. Moreover, this hypothesis is hard to square with the lack of comparable prison growth in other countries experiencing economic expansion. I do believe that increased state income may have interacted with the politicization of corrections policy in a manner that enabled the current boom. I find this to be a particularly provocative hypothesis worth continued exploration.

Some Basic Facts Regarding Changes in Sentencing Outcomes and Crime

Changes in incarceration rates are driven by three broad categories of factors that likely exert reciprocal influences on one another. First, the incarceration rate will depend on crime rates. Second, taking the level of offending as a given, the incarceration rate will be greater the higher the likelihood of being sent to prison conditional on committing a crime. Finally, holding offenses and offense severity constant, the longer the amount of time that an individual committed to prison can expect to serve, the higher the incarceration rate. These three factors can be measured by the crime rate, the number of prison commitments per crime committed, and the expected value of time served conditional on being sent to prison.

Table 1 presents estimates of these values for 1984 and 2002 from my research with Michael Stoll (2009) using the National Corrections Reporting Data (NCRP) for various years as well as data from the Uniform Crime Reports.1 Several notable patterns can be found in these data. First, sizable increases occur in the expected value of time served within all crime categories. In other words, conditional on being sent to prison, and conditional on the crime committed, felons admitted in 2002 faced much longer expected time served than offenders admitted in 1984. Second, prison admissions per 100,000 as well as prison admissions per crime committed increased considerably, with very large increases in admissions for drug offenses and parole violations. Although it is impossible to measure parole violation commissions per 100,000, it is worth noting that over this time period, the annual parole failure rate increased appreciably. Finally,

1. See Raphael and Stoll (2009) for details behind these tabulations.
Table 1. Comparison of expected time served, prison admission rates, incarceration risk per crime, and crime rates for the United States by type of criminal offense, 1984 and 2002

<table>
<thead>
<tr>
<th>Crime Type</th>
<th>Expected Value of Time Served in Years</th>
<th>Prison Admissions per 100,000</th>
<th>Crime Rate per 100,000</th>
<th>Prison Admissions per Crime Committed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Murder</td>
<td>6.49</td>
<td>8.13</td>
<td>5.47</td>
<td>4.98</td>
</tr>
<tr>
<td>Rape</td>
<td>2.98</td>
<td>5.30</td>
<td>4.35</td>
<td>7.70</td>
</tr>
<tr>
<td>Robbery</td>
<td>3.13</td>
<td>3.80</td>
<td>12.51</td>
<td>9.97</td>
</tr>
<tr>
<td>Assault</td>
<td>2.01</td>
<td>2.86</td>
<td>5.00</td>
<td>12.03</td>
</tr>
<tr>
<td>Other violent</td>
<td>2.30</td>
<td>3.47</td>
<td>1.72</td>
<td>3.53</td>
</tr>
<tr>
<td>Burglary</td>
<td>1.99</td>
<td>2.48</td>
<td>19.08</td>
<td>14.21</td>
</tr>
<tr>
<td>Larceny</td>
<td>1.44</td>
<td>2.17</td>
<td>13.93</td>
<td>17.83</td>
</tr>
<tr>
<td>Motor vehicle</td>
<td>1.42</td>
<td>1.87</td>
<td>0.99</td>
<td>2.79</td>
</tr>
<tr>
<td>Other property</td>
<td>1.52</td>
<td>2.49</td>
<td>3.01</td>
<td>4.98</td>
</tr>
<tr>
<td>Drugs</td>
<td>1.63</td>
<td>2.11</td>
<td>8.73</td>
<td>43.93</td>
</tr>
<tr>
<td>Other</td>
<td>2.92</td>
<td>2.27</td>
<td>12.45</td>
<td>20.26</td>
</tr>
<tr>
<td>Parole violators</td>
<td>1.27</td>
<td>1.44</td>
<td>20.48</td>
<td>80.75</td>
</tr>
</tbody>
</table>

Notes: Time served estimates come from Raphael and Stoll (2009). Each value is rescaled so that the expected value of time served is equal to the value implied by the national prison release rate for the year described. Prison admissions rates are estimated by applying the distribution of admissions by offense category estimated from the 1984 and 2002 NCRP files to the overall national admissions rates. Crime rates are based on the Uniform Crime Reports unless otherwise noted. Counterfactual crime rates are estimated using crime-specific incapacitation and deterrent effect estimates of incarceration on crime taken from Johnson and Raphael (2007).

- Crime rate estimates are based on imputed admissions per crime and on the observed admissions rates.
- Crime rates for drug crimes are equal to the number of adult arrests for drug crimes per 100,000 U.S. residents.
- Assumes a 25% increase in offending above the 2002 level (equal to the 2002 admissions weighted sum of the predicted increase above 2002 for the seven part 1 offenses).
- Set equal to the arrest rate for 2002.
- Based on average admissions per crime committed for non-homicide violent crimes by year.
- Based on average admissions per crime committed for non-burglary property crimes by year.
- Based on the weighted average admissions per crime for all crimes by year.
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comparing crime rates in 1984 and 2002 reveals some sizable declines in crime, especially property crime. Although there is a notable increase in drug crime, drug crimes are measured by arrests in this table. Hence, this surely reflects changes in policy regarding drug enforcement as well as possible changes in offending levels.

If one is willing to assume that within offense categories those being admitted in the latter year are comparable with those admitted in the earlier year (in terms of offense severity and criminal history), then a natural interpretation of the change in expected time served, commitments per crime committed, and parole violations is that these patterns reflect policy choices expressed by changes in sentencing and parole policy. Table 1 indicates that crime trends play a small role.

Of course, current crime rates are certainly lower today as a result of the massive increases in incarceration rates. However, even accounting for this fact leads us to conclude that increases in crime cannot explain a substantial portion of incarceration growth. The column in Table 1 labeled “2002 Counterfactual” provides our best guess at what crime rates would have been had the sentencing parameters remained at 1984 levels. Crime would certainly have been higher in the absence of changes in the sentencing parameters, and hence, the incarceration rate would have increased. However, we tabulate that the incarceration rate would have increased by no more than 17% of the actual increase experienced over this time period, leaving the remaining 83% attributable to changes in policy.

Our decomposition suggests that behavior, in terms of variation in crime rates, is a bit player in the story, whereas policy is of first-order importance. This finding, in turn, leads to the question of why sentencing policy took such a turn. Among the candidate explanations are many that Spelman (2009) explores in the current analysis; namely, changes in economic conditions, the politicization of corrections policy, and perhaps, increasing state incomes and revenues.

2. These counterfactual crime trends are based on estimates of the joint contemporary incapacitation and deterrent effects presented in Johnson and Raphael (2007).

3. Note that even 17% is likely to be an overestimate. In this tabulation, we attributed the entire increase in drug arrests to behavior, an assumption that should bias us toward finding larger impacts of changes in criminal behavior. In addition, several demographic changes over this time period would have militated toward lower offending, including the aging of the population, large increases in educational attainment, and the increase in the proportion that is foreign born.
Measuring Sentencing Policy Changes and Political Factors Influencing Incarceration Rates

I have tried on several occasions to code into measurable variables aspects of the sentencing and parole policies of states. In most such efforts, I was seeking an instrumental variable with the aim of identifying exogenous variation in a state’s incarceration rate to study the impact of incarceration on some other outcome, such as crime, or the incidence of infectious disease. In all such efforts, I have generally failed. I have been unable to find a consistent relationship between sentencing policy measures and changes in incarceration rates that survive basic specification checks and that conform to my a priori expectations of the likely sign of these variables. The only effort that I am aware of that yields the expected results is Levitt’s (1996) analysis of the impact of federal court orders on incarceration growth. These variables, however, are certainly an incomplete measure of the sentencing and parole policy environment of the state. It was this incompleteness that drove Michael Stoll and me (Raphael and Stoll, 2009) to look toward measuring trends in narrow outcomes (expected time served by offense and admissions per offense committed) that one could attribute to policy choices with greater certainty.

The incompleteness in Spelman’s (2009) characterization of the policy environment (i.e., the existence of habitual offender laws, truth-in-sentencing provisions, presumptive sentencing guidelines, and marijuana decriminalization) is what makes me a bit wary about downplaying sentencing policy. What is the role of determinate sentencing more generally, the move from discretionary parole toward mandatory parole, the numerous sentence enhancements under state and federal law for several offenses, or the harder to measure shifts in parole policy toward more stringent use of returns-to-custody for parole violators? Moreover, the practical implementation of these factors across states varies greatly, which complicates even more the task of measuring these factors and putting them on the right-hand side of a state-level panel data regression.

Measuring the potential political factors influencing corrections is even more difficult in that little variation is likely to occur in these factors over time and across states. The current analysis employs a handful of variables that largely measure the partisan composition of state and federal lawmakers at a given point in time (i.e., a citizen ideology index, an indicator for a Republican governor, whether the Republicans control the state legislature, whether there is mixed control of the legislature, percent of legislators who are Republican, and several measures of electoral cycles). Certainly, it is plausible that sentencing policy takes tougher turns under Republicans than under Democrats. However, what about the more general political asymmetry in crime policy faced by all legislatures regardless
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of party? In particular, I am referring to the fact that there is little to be gained politically by advocating for reductions in sentencing severity and, by extension, incarceration rates. Even modest reforms in this direction, such as shortening parole terms, are met with fierce political opposition that few are willing to contend regardless of belief.

How would such a general incentive toward being “tough on crime” fit into the empirical models here? In the extreme, if all legislators in all years faced the same incentives to be tough, no variation would occur to identify the true underlying effect of politics on incarceration trends. If these incentives varied by state but were constant over time, they would be swept away when the dependent and explanatory variables are first differenced. If they varied at the level of the nation, then these factors would be absorbed by the time fixed effects commonly included in the specifications of state-level crime and incarceration rate regressions.

Unfortunately, I am hard-pressed to suggest a strategy for empirically identifying variation in such political incentives and for estimating their relative importance in describing the incarceration boom. Despite my strong modeling orientation, here I believe we may have reached our limit and that we have much to learn from qualitative and historical research on sentencing policy.

The Impact of State Revenues on Incarceration Spending

Spelman (2009) hypothesizes that corrections spending may simply have increased with growth in state resources as well as in state spending in other policy domains. This correlation may be explained bureaucratically, in terms of a model of the world where increased allocations generate increased supply regardless of need. Alternatively, one could model this phenomenon as reflecting the changing demand of the median voter for public safety in the face of rising income and, by extension, state tax revenue. This suggestion is clearly plausible, and the significant and strong partial correlation that Spelman measures lends support to this interpretation.

However, several questions regarding this finding come to mind that again would lead to caution in this interpretation. First, why haven’t we seen similar increases in incarceration rates in other countries experiencing income growth? During a relatively short period, we have experienced a four-fold increase in incarceration rates after 50-plus years of stability. Not one Western European country has a current incarceration rate that comes close to ours. Moreover, the post-World War II period was characterized by strong economic growth and growth in personal income. In fact,
the annual economic growth rate in the United States declined markedly during the 1970s, coinciding with the beginning of the current incarceration boom. However, we did not see corresponding growth in incarceration during this earlier time period.

It is entirely plausible that a relaxed state budget constraint might have interacted with politics to fuel the recent boom. To the extent that sentencing policy was taken out of the hands of criminal justice officials and placed in the political arena, growing state revenues may certainly have enabled a game of political one-upmanship, driving the increases in time served and admissions per crime committed documented in Table 1. One might explore this possibility by tabulating these markers of sentencing severity by states from the NCRP and by assessing whether the changes were greatest in states experiencing the largest increases in state per capita income.

**Conclusion**

Spelman (2009) provides a rigorous and provocative analysis of growth in U.S. incarceration rates that advances and marshals evidence in favor of a new hypothesis. Namely, this article puts on the table the possibility that the increase in incarceration rate may be in part driven by our increased ability to pay for incarceration. Although I am convinced that changes in sentencing severity explain most of what happened, the phenomenal increases in incarceration that we have observed could not have occurred in the absence of available resources. In other words, it may be the case that growing state resources are a necessary (but not necessarily sufficient) condition for the incarceration growth that we have experienced.

Spelman (2009) provides much to consider and certainly advances how we should model growth in institutionalized populations. I am sure that this research will be a starting point for future inquiries into this very important trend.

**References**


**Steve Raphael** received his Ph.D. in economics from University of California, Berkeley in 1996. His primary fields of concentration are labor and urban economics. Raphael has authored several research projects investigating the relationship between racial segregation in housing markets and the relative employment prospects of African-Americans. Raphael has also written theoretical and empirical papers on the economics of discrimination, the role of access to transportation in determining employment outcomes, the relationship between unemployment and crime, the role of peer influences on youth behavior, the effect of trade unions on wage structures, and homelessness.