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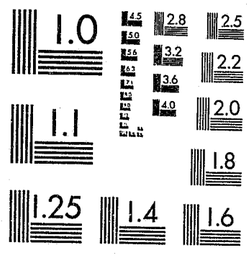

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FINAL REPORT*

CORRELATES OF INCARCERATION RATES:

Explaining the Pattern of Incarceration Between 1970 and 1979

NCJRS

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A. Problem

Recently, a Bureau of Justice Statistic's Bulletin disclosed that state prison populations have risen at an alarming rate of 18% since 1979 and this increase was not accompanied by a commensurate increase in prison capacity. As a result, prison overcrowding has become a major concern to criminal justice policy makers and the public. The rapid increase in prison populations that we as a nation have recently experienced suggests that attention should be paid to what factors or characteristics of the population are associated with incarceration rates. The present research identifies and examines possible indicators of incarceration rates in an attempt to explain, in a statistical sense, recent increases in prison populations. This research may provide a baseline of expected levels of imprisonment against which various states can compare their prison populations.

B. Literature Review

This section will examine the literature on the impact on incarceration rates of certain structural variables (age composition, unemployment rates, regional location), crime variables (crime reports and arrests for violent and property crime), and legal variables (sentencing policies, use of alternatives to incarceration, and increases in prison capacity).

In recent years considerable attention has been given to the patterns of rates of imprisonment. In a series of landmark articles, Blumstein et. al. observed that over a forty-year period the trends in prison rates were relatively stable (Blumstein and Cohen: 1973; Blumstein, Cohen and Nagin: 1979; Blumstein and Moitra: 1979; Blumstein, Cohen and Nagin: 1981). Although Rauma, among others, has questioned these findings (Rauma:

1981), the Blumstein work has focused considerable attention on the issue of prison population growth. While observing that a "stability theory" best characterizes a considerable amount of the history of prison rates, Blumstein et al (1981) state:

> "We are surprised, for example that no attention was paid to the significant growth of 40 percent in the United States imprisonment rate from 1971 to 1978. It is entirely possible that American society is becoming inherently more punitive... Alternatively the increase might reflect the demographic consequences of aging the post-war baby boom..." (1807-1808)

Blumstein et al (1981) suggested other elements that might influence imprisonment rates as did Rauma (unemployment levels) and Blumstein and Moitra (region). In short, while over long periods of time imprisonment rates may show stability, in the 1970's they experienced rapid rates of increase. It has been suggested that these increases can be accounted for by changes produced in the structural, crime and legal factors noted above. The suggested sources of the increase in prison populations to be analyzed in this research are age composition, unemployment, regional location, crime and arrest rates, changes in sentencing policy, the use of alternatives to incarceration, and increases in prison capacity.[1]

1. Age Composition. Research has suggested that the age structure of society and the changing age composition is a factor that must be considered when examining crime rates and crime rate fluctuations (Sagi and Wellford:1967). Examinations of official arrest statistics and prison population statistics reveal a definite age range which appears to incorporate the majority of offenders and inmates. In a survey of state prisoners, it was found that the majority of state prisoners fell between the ages of 18-29 (BJS Bulletin: 1983). Other studies have also examined this idea of a high, crime-prone age range with some identifying the range of 18-25 (Carroll and Doubet:

1983; Joubert et al:1981) within others noting that criminal behavior begins early, increases in early 20's and tends to decline thereafter until age 30 when the majority of criminal careers terminate (Petersilia, Greenwood, and Lavin:1978). If age composition or high rates of individuals in the 18-29 year old age range is associated with higher total crime and imprisonment rates, than we would expect that areas with a large percentage of their total population falling within this age range would have higher rates of imprisonment.

2. Unemployment. Unemployment rates can be thought to be indicative of the economic status of an area. Economic conditions may play a role in levels of crime and levels of imprisonment directly by encouraging individuals to engage in criminal behavior and thus increasing one's risk of imprisonment, or indirectly, by affecting the overall economic status of an area and the resources the area has to deal with law violators (police deployment, prison capacity, etc.). Freeman (1983) concluded from his review of several studies on unemployment and crime rates, that rises in unemployment and/or labor participation rates are associated with rises in the crime rate. Blumstein et al (1983) have suggested that unemployment may have a direct effect on prison populations through its role in individual sentencing decisions. It is contended by Blumstein et al (1983) that since employment history is a consideration in determining rehabilitative potential of offenders, lack of stable employment might increase the likelihood of offenders receiving incarceration as their sentence. In lieu of this, these scholars argue that general unemployment rates should be considered in any research on imprisonment rates. Joubert et al (1981) also recognized the need to consider socioeconomic conditions in their study of prison

admissions but they have been criticized by Carroll and Doubet (1983) for using per capita income rather than unemployment rates as their measure of economic conditions.

3. Geographic Location. Regional Variation may effect sentencing policies and thus effect imprisonment rates. Southern states have frequently been cited as having higher rates of incarceration than states in other geographic locations (Blumstein and Moitra:1979). Carroll and Doubet (1983), in their study of prison admissions, found that region (dummy variable for South) was the variable which had the strongest direct effect on the prison admission rate, with location in the South associated with high levels of imprisonment. Explanations for this relationship include the notion of the Gastil-Hackney hypothesis which characterizes the South as having a cultural tradition of violence that is independent of situational factors (Gastil:1971). While Loftin and Hill (1974) have demonstrated the weaknesses of the research testing this proposition, the observation that imprisonment rates and crime rates vary by region is uncontested.

4. Crime Report Rates and Arrest Rates. High levels of crime might affect incarceration rates either by increasing the number of people at risk to incarceration or by acting as a consciousness-raising factor for the justice system. Previous research on crime and crime rates found that reports of increased crime had strong effects on prison admissions (Joubert et al:1981; Carroll and Doubet:1983). Carroll and Doubet (1983) found that reported property crime itself did not significantly effect prison admissions but the rate of reported violent crime had a strong positive effect (B=.53 on rates of prison admission. To aggregate both property crime and violent crime (as

did Joubert et al: 1981) is, according to Carroll and Doubet (1983), to ignore the different effects that these two very different types of crime may have on prison admissions and to underestimate the effect that reported violent crime has on the prison admission rate. Reports of crime may indeed affect incarceration rates but it seems that arrests for crime might also be important in predicting prison rates. Arrests are even one step closer to an end product of incarceration than a report of a crime. Therefore, it is expected that arrests for violent crime and for property crime should more positively associate with incarceration rates than the rates of violent, property or total crime.

5. Sentencing Policy. The type of sentencing policy an area has (mandatory, determinate, indeterminate, presumptive) may play a role in incarceration rates. Sentencing policy, especially the existence of a mandatory and/or determinate sentence law could be expected to directly affect both the number of offenders sent to prison and the length of time an offender serves before release from prison (BJS Bulletin:1983). Under determinate sentencing, parole boards can not release prisoners until their sentences have expired (minus good time) and mandatory sentence provisions require a specific prison terms for every person convicted of a certain offense. Thus, it seems likely that offenders who are convicted and sentenced under these laws would spend longer time in prison due to the "no release" policy. It is also possible, though, that the existence of a mandatory and/or determinate sentence policy will have a deterrent effect and therefore less crime will be committed resulting in fewer commitments to prison in general.

6. Parole Use. Heavy reliance on parole should decrease the incarceration rate and conversely, areas in which parole is rarely relied on would be expected to have higher rates of incarceration simply because options are more limited.

7. Increases in Prison Capacity Due to the Construction of New State Prisons. "Periods of prison construction", as Blumstein et al (1983) term the increases in prison capacity due to the opening of new facilities, may be associated with prison populations. Prison capacity and its effect on prison populations has been a subject of some debate. There are those who argue that capacity is a major factor in predicting increases in prison populations, while others suggest that increases in prison capacity might be just one of the many factors which predict incarceration rates and it is not a dominant factor. Increases in prison capacity might lessen the concerns of judges about sentencing offenders to already overcrowded institutions and thus could lead to increases in incarceration rates (Blumstein et al:1983). Therefore, increases in prison population due to the building of new facilities could be a variable that may explain prison population fluctuations.

C. Methodology

The present research is an analysis of annual data collected on the 50 states during the period of 1970-1979. This involved utilizing a wide variety of data bases with the aim of predicting annual incarceration rates. Each variable included in the analysis is discussed in turn.

1. Dependent Variable--State Incarceration Rates. An incarceration rate for each state for each year in question was calculated by dividing the total number of persons in custody of the state correctional facilities on the last day of the year by the total annual population figure of

the state.[2] Alternative denominators were used in preliminary analyses but as they produced no substantial differences in results the more frequently utilized denominator of total population is used in the remainder of the paper. This rate includes only those prisoners who have sentences of at least one year and one day. Additionally, inmates who were housed in local jails due to overcrowding of state facilities were included in this rate.

2. Independent Variables. The factors noted above were operationalized in a very straight forward manner. The percentage of each state's total population that falls within the 18-29 age range was used as the indicator of age composition. Annual unemployment rates were collected for each state. A dummy variable for region (South =1) was created.[4] Reported crime rates were created by dividing the total number of crimes reported each year in the Uniform Crime Reports by the total population of each state. Property and violent report rates were examined separately. Annual arrest data were obtained for each state by offense, by property and violent subtotals and for all offenses and were divided by the total population of the state. Adjustments to these rates were made to account for the fact that there was some variation in the number of agencies that reported arrest data each year.[5] The existence of any mandatory sentencing policy and an underlying determinate sentencing policy were dummy coded into two separate variables (Mandatory=1 and Determinate =1) because it is possible to have one without the other. Parole use was measured by the number of parole releases (defined as state inmates who are granted discretionary conditional release followed by a time of supervision in the community) divided by the number of total releases. Parole data were unavailable for the first four

years of analysis (1970 -1973). Finally, a prison capacity increase variable was calculated by summing the increases in capacity due to the opening of new facilities. The estimated number of inmates that could be housed in these new facilities was counted as the capacity increase and zero capacity increase scores were assigned to states and years during which no few facility was built. (See Appendix A for a listing of specific data sources.)

3. Statistical Technique. The statistical technique utilized was multiple regression. For the analyses involving all the independent variables with the exception of the parole data, the total number of cases utilized is 496 (there were four missing data points). For the aggregate analysis involving the parole data, the number of cases shrinks to 298 due to the unavailability of this data for the years of 1970-1973 and the missing data for one state in 1974. In some cases the analysis included a dummy variable for year to account for the effect of variables not included in the analysis which correlate with year.

D. Data Analysis

The zero-order correlations of all the variables in the present analysis are displayed in Table I.

Table I About Here

Correlations between the dependent variable and the independent variables of .3 or greater include positive correlations between the incarceration rate and: location in the South (+.60), reported violent crime (+.46), and reported property crime (+.32). High values on these independent variables are associated with high values on rates of incarceration. In addition to the strong correlation between southern region and incar-

TABLE I

Intercorrelation Matrix

	Y1	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13
Y1	1.0													
X1	.46	1.0												
X2	.32	.44	1.0											
X3	.08	.25	.45	1.0										
X4	.23	.12	.55	.24	1.0									
X5	.24	.23	.15	.01	.08	1.0								
X6	.01	.02	.11	-.03	.08	.90	1.0							
X7	.24	.23	.26	.24	.19	.12	.10	1.0						
X8	.17	.12	-.00	.03	.14	.07	.01	.131	1.0					
X9	.01	.12	.20	.03	.10	.02	.00	.09	-.09	1.0				
X10	.31	.18	.17	.12	.05	.10	.01	.02	-.03	.05	1.0			
X11	-.21	-.12	.00	.04	-.12	-.08	.01	-.13	-.77	-.22	-.04	1.0		
X12	.60	.11	-.19	-.10	.02	.21	.01	-.01	.24	-.11	.18	-.34	1.0	
X13	-.29	-.09	.01	.15	-.07	-.03	.04	.01	-.15	-.02	-.16	-.27	-.14	1.0

Variables
Y1 = Incarceration Rate
X1 = Reported Violent Crime Rate
X2 = Reported Property Crime Rate
X3 = Unemployment Rate
X4 = Percent of Population Aged 18-29
X5 = Violent Arrest Rate
X6 = Property Arrest Rate
X7 = Existence of Mandatory Sentencing Policy
X8 = Determinate Sentencing Structure
X9 = Presumptive Sentencing Structure
X10 = Capacity Increase Due to Opening of New Facilities
X11 = Indeterminate Sentencing Structure
X12 = Location in the South
X13 = Parole Use Rate (1974-1979)

ceration rates, state location in the South is negatively correlated (-.34) with the presence of an underlying indeterminate sentencing scheme. Reported property crime rates are positively associated with reported violent crime (+.44), rates of unemployment (+.45), and percentage of total population in the 18-29 age range (+.55). Arrest rates for violent crime are very highly related to arrest rates for property crime (+.90).

The zero-order analysis of the 1970-1979 data, unadjusted for trend effects, suggest that several independent variables are moderately to strongly associated with incarceration rates. Additionally, it is apparrent that some of the independent variables (especially the crime variables) are associated with each other. Overall, however, the level of multi-collinearity appears quite low.

E. Regression Analysis.

Results of the regression equations for two aggregate equations are presented in Table II. Each model will be discussed in turn.

Table II About Here

1. Incarceration Rates for 1970-1979 Excluding Parole Use (N=496). Location in the South was the strongest predictor of the dependent variable (B =+.55)*, Rates of both reported violent crime (B =+.16) and reported property crime (B =+.35) had significant effects on incarceration and it is interesting to note that the effect of reported property crime was twice as strong as that for reported violent crime. Arrest rates for both violent (B =+.35) and property crime (B =-.37) significantly effected incarceration rates. The coefficient of property arrests

*B refers tc the standardized regression coefficients

TABLE II

Structural Equations (Beta Weights)
Predicting Incarceration Rates

Independent Variables	1970-1979 (N=496)	1974-1979 (N=298)
Reported Violent Crime Rate	.16 **	.43 **
Reported Property Crime Rate	.34 **	.14 **
Violent Arrest Rate	.35 **	-.03
Property Arrest Rate	-.37 **	-.04
Unemployment Rate	-.13 **	-.16 **
Percentage of Total Population Aged 18-29	.02	.07
Existance of Mandatory Sentence Policy (MANDATORY=1)	.15 **	.10 **
Indeterminate Sentencing Structure (INDETERMINATE=1)	.05	.06
Determinate Sentencing Structure (DETERMINATE=1)	-.02	.00
Presumptive Sentencing Structure (PRESUMPTIVE=1)	-.04	-.06 *
Capacity Increases Due to Opening of New State Facilities	.11 **	.10 **
Parole Use Rate	N/A	-.04
Location in the South (SOUTH=1)	.55 **	.58 **
Total Adjusted R^2	.64	.70
Total R^2	.65	.71

* p .05
** p .01

rates is in the negative direction meaning that increases in property arrest rates result in decreases in prison rates. Unemployment rates negatively effected incarceration (B =.-13) and a positive effect of capacity increase (B =+.11) was found. The existence of a mandatory sentencing policy had a positive effect on incarceration rates (B =+.15). Variables insignificant in the analysis included percentage of population 18-29, and underlying sentencing scheme. A total of sixty-five percent of the variance in incarceration rates was explained by the independent variables in the model.

2. Incarceration Rates for 1974-1979 Including Parole Use (N=298). This equation estimates the effects of the various independent variables including parole use data. Location in the South was the strongest predictor of incarceration rates (B =+.58). Rates of reported violent crime again had strong significant effects on the dependent variable (B =+.43). Property crime reports were also significant in predicting rates of imprisonment but the magnitude of this effect (B =+.14) was less than that found in the equation excluding parole data (N=496). Unemployment rates had a negative effect on imprisonment (B =-.16) as was the case in the previous equation. Increases in prison capacity were associated with increases in incarceration rates although the effect was weak (B =+.10), and presence of a mandatory sentence had a weak but positive effect on incarceration (B =+.10). The remaining independent variables were insignificant in predicting incarceration rates. The total R^2 for this equation was 71%.

3. Additional Regression Analysis. As noted earlier, the results of the analysis of time series data can be confounded by the effect of

variables not included in the analysis that are associated with year. To estimate such effects the regressions discussed above were run with year as a series of dummy variables. Results of these analyses are presented in Table III.

Table III About Here

As is evident from the above table, the strongest effect on incarceration rates for both equations is, again, location in the South (B =+.56 and B = +.57). In the model just examining the years 1974-1979 (N=298), the next strongest predictor is the reported violent crime rate (B =+.44). Reported property crime (B =+.09), existence of a mandatory sentence policy (=+.09), and increases in prison capacity due to the opening of new state penal facilities (B =+.09) all have positive effects on the dependent variable. Significant negative effects include the unemployment rate (B =-.20), an underlying presumptive sentencing scheme (B =-.18), and the dummy variable created for the year of 1974 (B =-.16). The total R^2 for the equation is 68%.

For the equation involving the entire time period (N=496) and the dummy variables for year, the second strongest predictor is property arrest rates with the effect in the negative direction (B =-.42). Violent arrest rates significantly effect incarceration rates (B =+.39), as well as do both violent and property reported crime rates (B =+.15 and B =+.38 respectively). The effects of mandatory sentence and indeterminate sentence policy were also significant and positive (B =+.14 and B =+.06). Capacity increase significantly predicted incarceration rates (B =+.09) as did the unemployment rate (B =-.17). In the model, the years of 1973 and 1974 both had significant negative effects on incarceration rates (B =-.13 for each). The total R^2 for this equation was 73%. Overall,

TABLE III

Structural Equations (Beta Weights)
Predicting Incarceration Rates
(With Dummy Variables For Year)

Independent Variables	1970-1979 (N=496)	1974-1979 (N=298)
Reported Violent Crime Rate	.15 **	.44 **
Reported Property Crime Rate	.38 **	.15 **
Violent Arrest Rate	.39 **	-.04
Property Arrest Rate	-.42 **	-.05
Unemployment Rate	-.17 **	-.20 **
Percentage of Total Population Aged 18-29	.00	.02
Existance of Mandatory Sentence Policy (MANDATORY=1)	.14 **	.09 *
Indeterminate Sentencing Structure (INDETERMINATE=1)	.06 *	.04
Determinate Sentencing Structure (DETERMINATE=1)	.07	.00
Presumptive Sentencing Structure (PRESUMPTIVE=1)	-.05	-.08 *
Capacity Increases Due to Opening of New State Facilities	.09 **	.09 *
Parole Use Rate	N/A	-.06
Location in South (SOUTH=1)	.57 **	.56 **
1970	.02	N/A
1971	.01	N/A
1972	-.05	N/A
1973	-.13 **	N/A
1974	-.13 **	-.16 **
1975	-.05	-.04
1976	.00	.02
1977	.02	.02
1978	.01	.01
1979	.02	-.02
Total Adjusted R^2	.67	.72
Total R^2	.68	.73

** p .01
* p .05

beta's did not change significantly but due to the significance of the dummies created for 1973 and 1974 and the possibility of trend some effects, the previous equations were re-estimated excluding the years of 1973 and 1974. Results are presented in Table IV.

Table IV About Here

As is evident from comparing Table III and Table IV, when the years 1973 and 1974 are excluded from the analysis, little change occurs in terms of the effect of the independent variables on incarceration rates. The overall R^2 decreases slightly and the magnitudes of the regression coefficients are slightly altered. The direction of the coefficients are consistent in both sets of equations and although one variable approaches significance in the new estimates (indeterminate sentence policy), the overall results remain essentially comparable. So, although they are apparently some "year" effects, they do not appear to radically change the estimates of the variables in the model.

Additionally, separate models were estimated for each year to determine if the predictors of incarceration rates differed in a year by year analysis with fewer cases than in the overall, aggregate model. The significant predictors were essentially the same as those which were found to be associated with incarceration rates in the previous models. Although a few independent variables significant in the aggregate analysis were insignificant in the smaller samples, the most consistent predictors of the dependent variable were southern location, reported violent and property crime rates, violent arrest rates and unemployment rates. Property crime arrest rates and existence of a mandatory sentence policy, although significant

TABLE IV

Structural Equations (Beta Weights)
Predicting Incarceration Rates
(Excluding 1973 and 1974 Due To Year Effects)

Independent Variables	1970-72, 1975-1979 (N=397)	1975-1979 (N=250)
Reported Violent Crime	.16 **	.52 **
Reported Property Crime	.40 **	.14 **
Violent Arrest Rate	.32 **	-.04
Property Arrest Rate	-.38 **	-.05
Unemployment Rate	-.18 **	-.22 **
Percentage of Population Aged 18-29	-.03	.01
Existance of Mandatory Sentencing Policy (MANDATORY=1)	.15 **	.07
Indeterminate Sentencing Structure (INDETERMINATE=1)	.07 *	.04
Determinate Sentencing Structure (DETERMINATE=1)	.07	.00
Presumptive Sentencing Structure (PRESUMPTIVE=1)	-.05	-.08 *
Capacity Increases Due to the Opening of New Facilities	.10 **	.07 *
Parole Use Rate	N/A	-.06
Regional Location in the South (SOUTH=1)	.59 **	.59 **
Adjusted R^2	.67	.72
R^2	.67	.72

** p .01
* p .05

in the aggregate, were insignificant at the "year" level.

F. Regression With Lagged Independent Variables

In order to determine whether or not there is a time interval between fluctuations in the structural, crime or legal variables and resulting changes in the rate of prison populations, the independent variables in this analysis were lagged one year so as to allow sufficient time for the prison populations to reflect changes in the above mentioned predictors. The time period of one year was chosen because it seemed to be a reasonable time to expect concomitant changes in the dependent variables due to changes in the independent variables. Essentially, each case's prison population rate for a specific year was regressed on the predictors of the previous year. Obviously, lagging variables reduces our original time interval of ten years to nine years. Again, models were estimated for the entire time period excluding the independent variables of parole release (due to the unavailability of these data for certain years) and for the time period during which these release data were available (1975-1979 for the lagged model). Results are presented in Table V.

Table V About Here

As is evident from a comparison of Table V and Table II, the results appear quite similar for both the lagged and unlagged aggregate equations. In many situations the coefficients are pratically identical but a few differences do emerge. For the lagged model without parole data (1971-1979), the impact of the violent arrest rate (B =+.21) decreases from that of the unlagged model (B =+.35), although still significant and in the same direction. Also, the effect of the property arrest rate (B =-.14) decreased in strength in the

TABLE V

Structural Equations (Beta Weights)
Predicting Incarceration Rates
(Lagged Independent Variables)

Independent Variables	1971-1979 (N=449)	1975-1979 (N=248)
Reported Violent Crime	.15 **	.39 **
Reported Property Crime	.39 **	.16 **
Violent Arrest Rate	.21 **	-.04
Property Arrest Rate	-.14 **	.01
Unemployment Rate	-.11 **	-.14 **
Percentage of Population Aged 18-29	-.03	.04
Existance of Mandatory Sentencing Policy (MANDATORY=1)	.14 **	.11
Indeterminate Sentencing Structure (INDETERMINATE=1)	.04	.06
Determinate Sentencing Structure (DETERMINATE=1)	-.01	.00
Presumptive Sentencing Structure (PRESUMPTIVE=1)	-.04	-.05
Capacity Increases Due to the Opening of New Facilities	.12 **	.12 **
Parole Use Rate	N/A	-.12 **
Regional Location in the South (SOUTH=1)	.57 **	.55 **
Adjusted R^2	.67	.72
R^2	.68	.73

** p .01
* p .05

lagged model from that of the model without time lags (B =-.37). This suggests that prison population fluctuations are more sensitive to current year arrest rates than arrest rates of the preceeding year. The remainder of the independent variables had approximately equal effects for this model. The variance explained was also similar in quantity. For the model involving parole data, again a comparison of the lagged and unlagged results yields similar findings with the exception of the loss of statistical significance of two variables in the lagged model which had just approached significance in the unlagged model (probably due to the decrease in sample size due to lagging) and the differential impact of one variable. The impact of the parole use rate increased in the lagged model from an insignificant coefficent of -.04 (unlagged) to a weak but significant coefficient of -.12 (lagged). While parole use did not affect prison population rates when predicting in the same year, fluctuations in parole use appear to require some time in order appreciate their full effect. Again, the R^2's in the lagged and unlagged models are quite similar. Obviously, longer time periods of analysis and different lagged structures could lead to different conclusions. For the period 1970-1979 our analsis of two year lags suggests that alternative lag structures should not alter this conclusion.

The lagged models (Table V) were also re-estimated excluding the region variable (Table VI). (See Section G for a discussion of why region was excluded). In this analysis the variable of reported property crime displayed confusing behavior and the coefficient for violent arrests rates more than doubled in the present equation. The effect of the percent of the population aged 18-29 increased as did the presence of pre-

TABLE VI

Structural Equations (Beta Weights)
Predicting Incarceration Rates
Excluding Region
(Lagged Independent Variables)

Independent Variables	1971-1979 (N=449)	1975-1979 (N=248)
Reported Violent Crime	.15 **	.36 **
Reported Property Crime	.17 **	-.07
Violent Arrest Rate	.49 **	.28 **
Property Arrest Rate	-.15 **	.04
Unemployment Rate	-.14 **	-.12 **
Percentage of Population Aged 18-29	.12 **	.07
Existance of Mandatory Sentencing Policy (MANDATORY=1)	.13 **	.13 **
Indeterminate Sentencing Structure (INDETERMINATE=1)	-.10 **	-.07
Determinate Sentencing Structure (DETERMINATE=1)	-.08	.06
Presumptive Sentencing Structure (PRESUMPTIVE=1)	-.10 **	-.10 *
Capacity Increases Due to the Opening of New Facilities	.21 **	.20 **
Parole Use Rate	N/A	-.22 **
Regional Location in the South (SOUTH=1)	N/A	N/A
Adjusted R^2	.48	.55
R^2	.49	.56

** p .01
* p .05

sumptive sentencing, prison capacity increases, and parole use. The R^2's of the lagged equation excluding region were .49 and .56 compared with .68 and .73 (lagged with region).

Table VI About Here

G. Regression Excluding Location in the South

All of the regression equations were re-estimated excluding the independent variable of location in the South. Obviously a variable indicating geographical region is an aggregate indicator of some unmeasured and unspecified set of region correlates. For this reason the concept of region as an explanation of crime or criminal justice is controversial. The results reported in Tables VII - IX repeat the results of our analyses when region is excluded. As would be anticipated from the zero-order correlations the elimination of region has a substantial effect on the estimates of the effects of all variables included in the equations.

Table VII About Here

Table VIII About Here

Table IX About Here

Rather than discuss each specific model excluding southern location, the general findings across models will be presented. Overall, there were many differences in the models which included a dummy variable for South (Tables II-IV) and those that did not (Tables VII-IX). The strength of the coefficients, as well as the directions of some independent variables changed. In terms of reports of violent crime, the strength of the coefficients, in general, increased in the models excluding region and the direction was consistent. The variable of property crime reports had inconsistent effects when compared

TABLE VII

Structural Equations (Beta Weights)
Predicting Incarceration Rates
Excluding Region

Independent Variables	1970-1979 (N=496)	1974-1979 (N=298)
Reported Violent Crime Rate	.17 **	.70 **
Reported Property Crime Rate	.16 **	-.20 **
Violent Arrest Rate	.91 **	.01
Property Arrest Rate	-.87 **	-.02
Unemployment Rate	-.15 **	-.12 **
Percentage of Total Population Aged 18-29	.12 **	.12 **
Existance of Mandatory Sentence Policy (MANDATORY=1)	.15 **	.11 **
Indeterminate Sentencing Structure (INDETERMINATE=1)	-.09 **	-.07
Determinate Sentencing Structure (DETERMINATE=1)	-.05	.05
Presumptive Sentencing Structure (PRESUMPTIVE=1)	-.11 **	-.13 **
Capacity Increases Due to Opening of New State Facilities	.19 **	.16 **
Parole Use Rate	N/A	-.18 **
Location in the South (SOUTH=1)	N/A	N/A
Total Adjusted R^2	.46	.51
Total R^2	.47	.52

* p .05
** p .01

TABLE VIII

Structural Equations (Beta Weights)
Predicting Incarceration Rates
Excluding Region
(With Dummy Variables For Year)

Independent Variables	1970-1979 (N=496)	1974-1979 (N=298)
Reported Violent Crime Rate	.17 **	.69 **
Reported Property Crime Rate	.18 **	-.16 **
Violent Arrest Rate	.94 **	.01
Property Arrest Rate	-.90 **	-.03
Unemployment Rate	-.19 **	-.16 **
Percentage of Total Population Aged 18-29	.09 *	.08
Existance of Mandatory Sentence Policy (MANDATORY=1)	.14 **	.10 *
Indeterminate Sentencing Structure (INDETERMINATE=1)	-.09 **	-.08
Determinate Sentencing Structure (DETERMINATE=1)	-.05	.07
Presumptive Sentencing Structure (PRESUMPTIVE=1)	-.13 **	-.15 **
Capacity Increases Due to Opening of New State Facilities	.17 **	.13 **
Parole Use Rate	N/A	-.18 **
Location in South (SOUTH=1)	N/A	N/A
1970	-.01	N/A
1971	-.05	N/A
1972	-.09 *	N/A
1973	-.14 **	N/A
1974	-.14 **	-.17 **
1975	-.02	-.05
1976	.02	.03
1977	.02	.02
1978	.00	.00
1979	.03	-.02
Total Adjusted R^2	.49	.52
Total R^2	.50	.54

** p .01
* p .05

TABLE IX

Structural Equations (Beta Weights)
Predicting Incarceration Rates
Excluding Region
(Excluding 1973 and 1974 Due To Year Effects)

Independent Variables	1970-72, 1975-1979 (N=397)	1975-1979 (N=250)
Reported Violent Crime	.30 **	.73 **
Reported Property Crime	.25 **	-.18 **
Violent Arrest Rate	.06	-.00
Property Arrest Rate	-.06	-.03
Unemployment Rate	-.16 **	-.17 **
Percentage of Population Aged 18-29	.08	.08
Existance of Mandatory Sentencing Policy (MANDATORY=1)	.13 **	.10 *
Indeterminate Sentencing Structure (INDETERMINATE=1)	-.16 **	-.07
Determinate Sentencing Structure (DETERMINATE=1)	-.06	.06
Presumptive Sentencing Structure (PRESUMPTIVE=1)	-.15 **	-.16 **
Capacity Increases Due to the Opening of New Facilities	.24 **	.13 **
Parole Use Rate	N/A	-.18 **
Regional Location in the South (SOUTH=1)	N/A	N/A
Adjusted R^2	.34	.51
R^2	.35	.53

** p .01
* p .05

to the results of models which included region. In half of the equations, the coefficient switched from positive to negative and in some other equations the coefficient decreased in strength though remaining positive. Arrest rates for both violent and property crime appeared to be very different in equations excluding the region variable. In many models excluding the region variable, the strength of both coefficients doubled or more than doubled when compared with those of equations including this independent variable. The percent of the population aged 18-29, although insignificant in many equations including South, became significant or increased in strength when region was excluded. The coefficients of both indeterminate and presumptive sentencing structures became significant and negative in the new equations. The effect of capacity increase, although usually positive and significant in previous models, increased in strength in every equation excluding the region variable. The coefficient of parole use, in general, increased in strength while remaining negative. In summary, equations including a region variable yielded very different results from those without this independent variable. The most dramatic changes occurred with the arrest, reported crime and the capacity variables, although other independent variables were also effected. Obviously, the explained variance is less in the present models but the R^2's are still quite high (35%-54% compared to 65%-73%). These results strongly suggest that future research attempt to disentangle the effects of those variables aggregated in a region variable.

H. Summary and Conclusions

The growth in the imprisonment rate during the 1970's is strongly associated with changes in demographic, structural and legal characteristics.

The level of crime and arrests (by type), percentage of the population aged 18-29, unemployment, sentencing practices, prison capacity changes, and parole use were found to be significantly associated with imprisonment rates. These variables accounted for 34 to 58% (depending on whether trend was considered and whether parole use was included) of the variance in imprisonment rates. These results suggest that the growth in imprisonment rates, in part, reflects changes in the characteristics of crime, society, and the criminal justice system that theory and good sense suggest should produce larger prison populations. If data on the length of sentence and proportion of sentences served were available, it is anticipated that imprisonment rates would be even more understandable.

Obviously, substantial unexplained variation exists in these analyses. The variation associated with location in the South represents variation we can attribute to a regional effect even if we cannot describe what that regional effect is or how it effects levels of imprisonment. The persistence of an association between imprisonment, (and in other research) crime and region suggests that additional research should be conducted to better understand "regional affects". Even with this shadow variable included, between 32 and 27% of the variation in imprisonment rates is unexplained. It seems reasonable to hypothesize that better explanation of imprisonment rates requires data on changes in criminal justice policies that impact on time served, sentence lengths and parole release criteria. Our future research will pay close attention to this possibility.

The distinction between policy changes and other correllates of incarceration rates must not mask the fact that while some characteristics may be less

affected by policy decisions in the criminal justice system, the effects of all variables can be altered by policy decisions. For example, while now we tend to incarcerate individuals in their late twenties to thirties, adoption of a selective incapacitation model might result in higher rates of incarceration for 18-22 year olds. Thus, demographic effects could be dramatically altered. While our year by year analysis suggests stability in estimates of demographic and other variables, we must not begin to think that only some variables are policy dependent -- all can be. A rational policy for use of prison capacity is one that first understands how and why imprisonment is being used -- only then can policy choices be debated, made and implemented.

NOTES

[1] Data are not available on a national level for this time period for one other obvious variable, changes in time served in prison. Longer sentences or changes in parole decision-making could also affect the size of prison populations. Our current research is addressing this issue in greater detail.

[2] Due to the desire to obtain the most accurate measure of incarceration rates, some corrections to reported rates were necessary to account for changes in reporting requirements by NPS, for inability of states to comply with these changes, and for inmates who were under state jurisdiction but housed in local jails due to overcrowding and who should have been included in a state incarceration rate. These corrections will be discussed in turn as well as any known problems with the incarceration rates.

1970 Incarceration Rates-Source: Prisoners in State and Federal Institutions 1970. Data was missing for Alaska, Arkansas, and Rhode Island. There is no mention of any state prisoners housed in local jails due to overcrowding that were not included in the count and no indication of the number of prisoners, if any, who were included in the count but who had sentences of less than a year and a day.

1971 Incarceration Rates-Source: Prisoners in State and Federal Institutions on December 31, 1971,1972,1973. (1974) Certain percentages of prisoners was subtracted for four states due to our exclusion of prisoners included in the counts who had sentences of less than one year and one day (Colorado, Maryland, Massachusettes, Oregon). Additionally, the number of incarcerated prisoners for the state of Vermont is an overestimate due to an unknown percentage of prisoners with sentences of less than one year and one day who were included in the total. There was no indication that prisoners were housed in local jails due to overcrowding.

1972 Incarceration Rates - Source: same as 1971 rates. Percentages of prisoners were subtracted from four states (Colorado, Maryland, Massachusettes, Oregon) due to included prisoners with inappropriate sentence lengths. There was no indication of any prisoners housed in local jails due to overcrowding that were not included.

1973 Incarceration Rates - Source: same as 1971 rates. Corrections for sentence length were made for four states (Colorado, Maryland, Massachusettes, Oregon) and there was no indication of any prisoners housed in local jails due to overcrowding that were not included.

1974 Incarceration Rates - Source: Prisoners in State and Federal Institutions on December 31, 1975. Corrections were made for four states (Maryland, Massachusettes, Mississippi, South Carolina) due to the inclusion of inappropriate sentence lengths in the total count. A unknown percentage of prisoners with sentences of less than one year and one day was included in the rate for Pennsylvania. There was no indication of any prisoners housed in local jails due to overcrowding that were not included in the counts.

1975 Incarceration Rates - Source: Prisoners in State and Federal Institutions on December 31, 1976. Corrections were again made for two states that included inappropriate sentence lengths (Maryland, Mississippi). Pennsylvania's incarceration rate may be an overestimate due to an unknown percentage of prisoners included in the rate with

sentences of less than one year and one day. The 1975 estimates included those inmates, due to overcrowding, who were housed in local jails with one exception. It is known that some Alabama state prisoners were housed in local jails due to overcrowding but the actual number of these inmates is unknown.

1976 Incarceration Rates - Source: Prisoners in State and Federal Institutions on December 31, 1977. Incarceration data for 1976 was adjusted to include the state inmates housed in local jails due to overcrowding and corrections for the inclusion of inmates with sentences of less than one year and one day were made (Maryland, Mississippi, Oregon).

1977 Incarceration Rates - Source: Prisoners in State and Federal Institutions on December 31, 1978. Adjustments were made for states who housed state inmates in local jails. Corrections for sentence length were made for Arkansas, Florida, Maine and Maryland. The incarceration rate for Tennessee may be an overestimate due to an unknown percentage of inmates who had a sentence of exactly one year.

1978 Incarceration Rates - Source: Prisoners in State and Federal Institutions on December 31, 1979. Adjustments were made for several states who had a known number of state inmates housed in local jails due to overcrowding and corrections for sentence length were made for Maryland and Oklahoma.

1979 Incarceration Rates - Source: Prisoners in State and Federal Institutions on December 31, 1980. Adjustments were made for states with known numbers of inmates housed in local jails due to overcrowding and corrections were made to Maryland and Oklahoma for their inclusion of inmates with sentences of less than one year and one day.

It should be noted that several states (Alaska, Connecticut, Delaware, Hawaii, Rhode Island, and Vermont) have an integrated system without separate jail/prison facilities.

[3]Several different population bases were tested in the calculation of state incarceration rates (e.g. 18-44, 18-29, 25-44, etc.) and the zero-order correlations between these rates were at least .98. The base of 18-29 was eventually selected due to theoretical considerations.

[4]States defined as Southern include: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

[5]The formula used to correct for nonreporting of police agencies of arrest data is as follows:

$$\text{Arrest Rate Estimate} = \frac{\text{Total State Population}}{\text{Population Covered by Reporting Agencies}} \times \text{Arrest Rate of Particular Offense}$$

To rate this variable we divided the above estimate by the total population in the state.

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END