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Thirty Years of Growth in Kentucky's Prison Population and Spending: A Multi-causal Analysis

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Abstract: America entered the era of mass incarceration in 1972, and by 2008 state prisons grew to the point that the imprisonment rate was five and one-half times that of European Union member states. State rates have decreased somewhat but the trend is uneven: in 2011 prison populations increased in twenty-four states, with Kentucky recording the greatest rate increase. Early explanations of the prison boom as a necessary reaction to moral decline was replaced by the 1990s with two conceptually distinct perspectives. First, structural explanations suggest that prison growth is the consequence of a neo-liberalist ideology emphasizing strict governmental control of the marginalized members of the social underclass. A second perspective places greater emphasis on the influence of criminal justice policy decisions. Both perspectives suggest that prison growth varies dramatically between states.

Spelman's (2009) national-level analysis of prison growth is notable for its broad inclusion of both social threat, structural and policy variables; coverage of most of the period of prison expansion; and sophisticated methodology. However, it does not account for differences in between states. Here we report on our research adapting Spelman's approach to investigate factors influencing Kentucky's prison growth between 1997 and 2005. We determine the influence of eighteen independent variables, grouped by category and theoretical perspective, and the results are compared to Spelman's national findings. We discuss the implications of our findings for a broader consideration of the influence of social threat, structural and policy perspectives for the growth of mass incarceration in America.

INTRODUCTION

Between 1972 and 2008 the population in the nation's State prisons grew by 708 percent, to the point that the incarceration rate in the United States was roughly four and one-half times the world's average (International Centre for Prison Studies, 2013), five and one-half times that of European Union member states (Raphael, 2009). Since 2009, the overall number of individuals incarcerated for violations of state laws has decreased slightly (Carson & Sabol, 2012), but in 2011, the most recent for which national data is available, twenty-four states experienced a growth in their prison populations, and the overall population decline can be attributed to reductions in a single state (California). Among the growth states, Kentucky recorded the greatest rate increase (Carson & Sabol, 2012), as it had in 2007 (Riordan, 2008).¹

As states continue to manage large prison populations, spending on prisons has continued to increase. By fiscal 2011 annual spending on state prisons exceeded 52 billion dollars, with all but 2.9 percent coming from state funds. Despite recent efforts to control state government expenses, correctional spending has become a greater portion of state budgets and ranks only behind education and Medicaid general fund expenditures (National Association of State Budget Officers, 2012).

¹ Kentucky's position as a "high-growth" state was confirmed in a qualitative study of Kentucky's which finds that a lack of prison programs, employment issues after incarceration, the loss of good time credit, sentencing policies, and stricter enforcement of parole and probation violations has created a "machine of perpetual prisoners" (Austin, Richards & Jones, 2004).

Most incarcerated offenders are housed in state-run prisons and jails, and supported by state and local revenues. Thus any attempts to address mass incarceration as a social concern necessarily needs to be grounded in an understanding of conditions within a state. Here we examine the influence of a range of social conditions, public attitudes, and government policies suggested by previous research on the expansion of the prison enterprise in Kentucky, a "high-growth" state.

Background

The prison boom and its costs have received much attention, as scholars and policy makers seek to understand its causes and search for ways in which to mitigate their negative effects on society. Their conclusions vary dramatically, ranging from conceptual discussions of the emergence of the neo-liberalism in America to statistical accounts of how prison growth is affected by crime rates and socio-demographic indicators. A variety of positions have been expressed, leading to spirited debates concerning just how to go about explaining and addressing the prison issue. The most common positions are captured in three broad perspectives that, while interrelated, are conceptually distinct in that they emphasize different causes for the prison boom and offer different remedies for its excesses. Following from Gottschalk (2009), these perspectives focus on the role of social threats, social structural dynamics, and criminal justice policies.

Social Threats

As awareness and concern about prison growth emerged in the 1970s, politicians, scholars and the media were quick to attribute the problem to the decline of personal morals and self-centeredness

particularly as observed among the growing number of young urban minority male offenders (Gottfredson & Hirschi, 1990; Halpern, 2001). Collectively, the moral decline argument can be seen as a pessimistic assessment of the decline of culture (Bennett, 2001), expressed in this instance as a growing fear of crime (Garofalo & Laub, 1978; Glassner, 1999; Simon, 2007) and cynicism about the competence of social institutions traditionally counted upon to promote consensus of moral values in American society (Allen, 1981) and a growing fear of crime. The notion of moral decline, that things were better in “the good old days,” has been associated with a conservative view of society (Eibach & Libby, 2009).

The neo-liberalist ideology emerging at the beginning of the prison boom had a dualistic quality: the government should have no role in controlling natural economic forces through criminal law, a principle that greatly empowers the position of wealthy and powerful players in the capitalist marketplace (Harcourt, 2008). Rather, the legitimate function of criminal law in capitalist society is to exercise control over those who bypass the market (Posner, 1985), thus further marginalizing those who would threaten the capitalist economic structure by engaging in criminal enterprise for profit, who are unable to compete and drain resources through subsidized welfare programs, and those who are incompetent due to mental and physical illness. The neo-liberalist ideology considers a robust penal response, overseen by government agencies, as the most effective strategy for controlling those who undermine the capitalist market society (Harcourt, 2008). From this perspective, prison growth could be attributed to the punitive response to the perceived social threat posed by the underclass. Essentially, more Blacks, more poor and more young people equals more

crime, which both directly and indirectly threatens the functioning of society.

Reductions in prison population and spending from this perspective make sense if the marginal economic and social returns in crime prevention associated with incarceration do not match the costs of imprisonment. Independent cost-benefit analyses have usually identified a cost-benefit tipping point considerably below current incarceration rates in state prisons and jails, suggesting that a purely rational model has not guided prison policy and that subjective factors such as perceptions of cultural decline and likelihood of criminal victimization held by influential members of society have an important role in determining penal policy.

Empirical research supporting this perspective indicates that when the social fabric is threatened, societies become more punitive in their treatment of offenders and more likely to incarcerate them (Adamson, 1984; Box, 1987; Greenberg, 1977; Link & Shover, 1986; Spohn & Halloran, 2000; Tyler & Boeckmann, 1997). Indicators of social threat include high crime rates, growing populations of ethnic minorities and the poor, and high rates of unemployment.

Crime. One of the more consistent research findings is that changes in state imprisonment rates are positively influenced by changes in the rate of violent crime (Arvanites & Asher, 1998; Beckett & Western, 2001; Greenberg & West, 2001; Jacobs & Carmichael, 2001; Michalowski & Pearson, 1990; Ouimet & Tremblay, 1996; Spelman, 2009) and drug arrests (Blumstein, 2011; Blumstein & Beck, 1999; Greenberg & West, 2001; Zimring & Hawkins, 1995), but not by changes in the rate of property crime (Greenberg & West, 2001).²

² On the other hand, even though rates of serious crime in the United States began to decline in 1993, prison admissions and populations continued to grow.

Race. Higher rates of imprisonment exist in states with higher rates of African-American citizens (Carroll & Cornell, 1985; Beckett & Western, 2001; Greenberg & West, 2001; Jacobs & Carmichael, 2001; Jacobs & Helms, 1996; Smith, 2004). Race also has important indirect effects in mediating the relationship between other forms of social threat and incarceration rates (Alexander, 2012; Tonry, 2011).

Poverty. Prison population rates are positively associated with indicators of poverty (Arvanites & Asher, 1995; Beckett & Western, 2001; Greenberg & West, 2001; Sorensen & Stemen, 2002). Chiricos and Delone (1992) find that labor surplus is consistently and significantly related to high incarceration rates, while Western, Klaykemp and Rosenfeld (2006) assert that the effect of employment on incarceration rates is mediated by race: a 10 percent increase in employment rates of white men was not significantly related to lower incarceration rates but such an increase would have a statistically significant impact African American men's probability of imprisonment.

Unemployment. Employment has the greatest impact on incarceration rates in communities where whites feel threatened by the dual influences of widespread unemployment high concentration of African-American residents. King and Wheelock (2007) find that a rapid increase in unemployment, African-American population, or both, resulted in punitive attitudes towards African-Americans by whites (when controlling for crime rate).

Scholars have concluded that "get tough" crime policies (Smith, 2004; Sorensen & Stemen, 2002), fueled by increasing public anxieties about the threat of crime and by conservative social movements (Greenberg & West, 2001; Jacobs & Carmichael, 2001; Useem, Liedka & Piehl 2003) have influenced the relationship between crime and imprisonment rates.

They conclude that the incarceration rate from these areas is best explained by the micro-level perceived threats rather than a direct effect of community unemployment or racial balance.

Social Structural Dynamics

By the mid-1990s, the demonization of people living in inner-city, high-crime neighborhoods was partially counteracted by a shift in focus to the structural "roots" of crime and punishment (Gottschalk, 2009). This perspective suggests that prison populations are primarily influenced by broader social dynamics such as racism, poverty, political disenfranchisement, limited educational and employment opportunity, and the breakdown of education and other forms of social support (Alexander, 2012; Gottschalk, 2006; Tonry, 2011; Wacquant, 2009). One interesting conclusion that can be derived from this perspective is that the current reductions in the growth of prison populations and spending are likely to be merely a temporary reaction to the recent financial crisis. Without a substantial alteration of the relationships between marginalized and dominant groups in society and restructuring of social institutions during the time of economic recovery, natural social processes will once again assert themselves and the prison growth process will resume (Wacquant, 2011). Social realignment is a long and complex process that affects society in ways well beyond the prison enterprise. While efforts to address social and structural inequities in society are laudable in many ways, they are not likely to result in a rapid reduction of prison populations and spending (Gottschalk, 2009).

A variety of research studies have been undertaken from a social dynamics perspective, and lend support to it.

Economic inequality. Jacobs (1978) found that a statistically significant relationship existed between economic

inequality and incarceration rates for burglary and larceny, but not for violent crimes when controlling for immigration, city size, strength of police force, and community resources.

Failure of educational and welfare systems. As school dropout rates increase, so do incarceration rates (Spelman, 2009). Lochner and Morreti (2004) report that one extra year of school completion is associated with a 10 percent reduction in the probability of incarceration for whites, but merely a 3.7 percent reduction for blacks. They estimate that differences in educational attainment between the races can explain up to 23 percent of the disparity in incarceration rates. Incarceration rates are also negatively associated with AFDC payments (Beckett & Western, 2001)

Family breakdown. Heightened rates of children born out of wedlock and households headed by a single parent, particularly in the underclass, are associated with high rate of imprisonment in states (Wildeman and Western, 2010). In turn, family disruption caused by imprisonment, seen most prominently in inner-city minority neighborhoods, puts children at greater risk of social failure, criminal activity, and imprisonment (Hagan and Dinovitzer, 1999; Western, 2006).

Criminal Justice Policies

The “democracy in action” approach (Smith 2004) suggests that the government does not respond to social threats, per se, but rather responds to public opinion. State electoral politics are the link between the opinion of the state and the policies implemented (Erikson, Wright & McIver 1989), and the party that appears to be most responsive to the concerns of the public is most likely to win state elections. During the imprisonment boom, politicians capitalized on the opportunity to be “tough” on crime

by catering to a public that lost confidence in the social welfare strategies of the Nixon and Johnson administrations, and expected the government to “do something” about the problem. The consequent regime change of the 1980s resulted in shifting control of crime and punishment from the criminal justice system to the political system (Blumstein, 2011).

The criminal justice policy perspective asserts that the emergence of mass imprisonment is the result of legislative and administrative policy decisions that cause growth in arrest and conviction rates, sentences of imprisonment, prison time served, prison and jail overcrowding, and revocation of probation and parole. Indeed, we have experienced other periods of heightened crime rates, economic decline, poverty and racial tensions in our nation’s history that have not resulted in dramatic increases in incarceration rates (Gottschalk, 2009). From this perspective, state politics that result in criminal justice policies that impact prison populations and spending operate independently from social threats and structural dynamics. This is evident in the states of North and South Dakota: both are similar in crime rates, social characteristics, and institutional performance yet South Dakota’s incarceration rate grew 477 percent between 1978 and 2004, while its neighbor to the north experienced only a 133 percent increase (Clear, Cole & Reisig, 2006).

Scholars who place great emphasis on the effect of criminal justice policies have been criticized on three accounts. First, they are most likely to focus on those that have emerged in the 1970s and 1980s but the seeds of change might well precede this era and could be rooted in unexpected ways to welfare reform, racial and gender civil rights, as well as other social movements (Alexander, 2012; Gottschalk, 2006; Tonry, 2011; Wacquant, 2009). Next, they tend to

focus on the consequences of “get tough” crime policies, such as the War on Drugs, habitual and persistent offender laws, decisions to address prison overcrowding by transferring state inmates to local jails, and Truth in Sentencing legislation, and neglect or minimize the complex processes that bring about such laws (Gottschalk, 2006), including the complications introduced by greater involvement of the federal government in anti-crime activities, and in general our federalist form of government (Miller, 2008). Finally, they minimize the distinctive role of local interests that result in substantially different implementation and effect of similar laws between states (Barker, 2009).

Still, those who adopt a policy perspective are more optimistic than others about the chances of radically reducing prison populations and spending in a relatively short period of time (Gottschalk, 2009). Since government leaders have the capacity to create and enforce the laws and administrative policies that brought about the prison boom, they also have the capacity to change them. According to Spelman, “(r)egardless of what instrument we choose, the more basic finding is that nothing was inevitable about the prison buildup in the United States...it is fully under control of the public policy makers” (2009: 73). He estimates that prison populations could be reduced by roughly fifty percent without compromising public safety, by seeking policy alternatives and redirecting prison spending.

Research suggests a significant influence of conservative public opinion and fear of crime, political activities, state spending, and criminal justice policies on imprisonment.

Public opinion and fear of crime. Conservative public opinion is a significant, positive predictor of prison populations

(Greenberg & West, 2001; Jacobs & Carmichael, 2001) and spending to increase prison capacity (Spelman, 2009). Fear of crime, especially related to the criminal activity of Blacks (Chambliss, 1995), has fueled the growth of imprisonment (Garland, 2001) and vice versa: the public attention given to sensational crimes has increased the public’s belief that they will become victims of crime (Simon, 2007). Growing public concern about drug use and addiction during the rise of the conservative era resulted in more punitive sanctioning, including mandatory incarceration for offenders that were likely to receive sentences of probation in the past (Beckett, 1997; Reinerman & Levine, 1997).

Politics. Jacobs and Helms (1996) find a positive association between prison admission rates and the strength of the Republican Party in states. They, and others, suggest that Republican Party is the more conservative in nature, and that rates of imprisonment (Jacobs & Carmichael, 2001; Smith, 2004) and prison spending (Spelman, 2009) are greater in states where they control the legislature and governor’s office.

State spending. As the state revenue per capita increases so do incarceration rates (Greenberg and West, 2001). Spelman (2009) finds that total state spending per capita for all state functions is positively associated with prison capital expenditures, but that current state mandatory spending (on interest payments, education, health, hospitals, highways, and especially social welfare programs) is inversely related to prison capital spending. Greenberg and West (2001) also find a significant inverse relationship between prison population growth and spending on social welfare programs, and Smith (2004) finds a similar inverse relationship between prison populations and state spending on education.

Sentencing. Increasing the length of sentences and the imposition of increasingly long mandatory minimum stays in prison for specific offenses has contributed to growing prison populations and, presumably, prison spending (Blumstein, 2011). Determinate sentencing laws are intended to send offenders to prison for a fixed period of time with no opportunity for parole (Marvell and Moody, 1996). While they allow for term reductions for good behavior in prison, they restrict the discretion of judges in the sentences to a narrow range of time. Research results concerning the effect of determinate sentencing on prison populations have been inconsistent: some studies show an increase in prison populations after enactment (Casper, Brerton & Neal, 1983; Casper & Brerton, 1984; Howard, 1978; Ku, 1980; Lipson & Peterson, 1980) while others show a decrease attributed to their deterrent effect (Clark, 1987; Greenberg & West, 2001; Hewitt & Clear, 1983; Jacobs & Carmichael, 2001; Ku, 1980; Marvell & Moody, 1996; Smith 2004; Sorensen & Stemen, 2002) or no effect at all (Carroll & Cornell, 1985). However, when prison populations increase beyond the rated capacity of institutions, one common solution is to hold offenders convicted in state courts in local jails until space becomes available for them in a state prison, or even transfer inmates from prison to jails depending on a number of factors including their security classification. Since local jails provide a short-term solution for prison overcrowding but have a finite capacity for housing inmates, available jail capacity could influence the prison capital spending policy decisions (Greenberg & West, 2001).

Like mandatory minimum sentencing, “three strikes,” persistent felon, or habitual offender laws, call for longer prison terms. These sentencing enhancements have been

found to only slightly increase imprisonment rates (Turner, Greenwood, Chen & Fain, 1999), and in multivariate models have no significant effect (Smith, 2004), except with specific offenses such as drug offenses (Sorensen & Stemen, 2002). Spelman (2009) finds that prison spending was lower for states that implemented habitual offender laws due to a short- and long-term effect on prison populations.

In 1994, the federal Crime Bill provided ten billion dollars for prison construction between 1995 and 2000, but the money was only made available to states that passed Truth-in-Sentencing (TIS) laws, which require offenders to serve 85 percent of their prison sentences. By 1998, 27 states had passed TIS, although the percentage of sentence that was required to be served varied (Ditton & Wilson, 1999). In the short term, lengthening the time served for some offenders was not found to dramatically increase imprisonment rates (Grimes & Rogers, 1999; Turner, Greenwood, Chen & Fain, 1999), but more recent projections of the long-term effect of these laws estimate that TIS states will eventually have populations 13 percent greater than those states without such laws (Spelman, 2009).

Social Threat, Structural and Policy Explanations

Explanations of the prison boom implicate several dimensions and indicators of the growing social threat of the underclass, structural dynamics in American society, and criminal justice policy decisions of government officials. It is not clear, however, which of these explanations, or combinations thereof, provides the best answer. As a consequence we lack a consensus strategy on how to eliminate prison population overruns and spending excess. Much of the problem is methodological. Many studies are plagued

by data limitations caused by inconsistent data definitions, collection and recording (Murray, 2009; Smith, 2004; Spelman, 2008). Also, most early studies focused on a single or a few explanatory variables, usually representing different dimensions of the same general perspective, rather than examining the simultaneous and interactive effects of many factors (Jacobs & Helms, 1999; Smith, 2004). Finally, few research studies are designed to examine changes in prison populations and spending over the long term. Given changes in public opinion, social demographics, government policies and economic conditions since the time that prison populations and spending began to grow over forty years ago, long term research is necessary to understand how the relative influence of different factors might have changed over time. Longitudinal research is also important since some causal influences have an immediate effect on imprisonment rates (i.e., those that increase prison admission rates), while others might take years to influence rates (i.e., sentences insuring longer periods of incarceration).

There have been some recognized studies that address these methodological concerns. In 1996 and 1999, Jacobs and Helms published a multivariate time series regression analyses of prison admission rates. Jacobs and Carmichael (2001) also examined the simultaneous influence of several indicators on prison populations, and Greenberg and West (2001) investigated several factors influencing state imprisonment rates between 1970 and 1990, making comparisons in decennial increments. Sorensen and Stemen (2002) studied the effect of state sentencing policies on incarceration rates while controlling for crime rates and several measures of social threat. Smith (2004) also explored the influence of politics and government

policies, simultaneously with crime and other social threat indicators.

We believe that the most sophisticated and comprehensive analysis of the growth of prison populations and spending to date is Robert Spelman's article published in *Criminology and Public Policy* in 2009. Our review found his approach is notable for many reasons: it uses time-series analysis to compare data throughout most of the period of prison growth, which allows for an understanding of immediate and lagged influences on prison populations and spending (Spelman, 2008); uses annual rather than the decennial data used in earlier longitudinal studies (i.e., Greenberg & West, 2001; Jacobs & Carmichael, 2001), and includes measures of a comprehensive set of thirty-three explanatory variables that reflect the scientific literature and are grouped into categories compatible with the general theoretical perspectives represented in the literature.

With data from 50 states for the period of 1977 to 2005 Spelman estimates the effects of several measures of social threat, social structure and criminal justice policies on both capital spending for prisons and prison populations. He concludes that spending on prisons is largely determined by criminal justice policies developed in reaction to public opinion, overall state government spending, and economic social threats. As for prison population trends, Spelman finds that they are primarily influenced by the social threats of growing crime and deteriorating economic conditions, overall state government spending, and criminal justice policies. He finds no significant influence of social structural dynamics affecting prison capital spending or prison populations.

Spelman's research is both interesting and highly informative, but is not well oriented to developing strategies to reduce

of mass incarceration since his findings reflect national trends and do not report differences in the relative influence of explanatory variables between states. There is substantial variation between states in socio-demographic and economic trends, the performance of social institutions, public opinion and engagement, and criminal justice policy creation and implementation (Barker, 2009; Gottshalk, 2009; Michalowski & Person, 1990). We suspect that the relative influence of the explanatory variables used in Spelman's analysis also varies from state to state.

Here we describe the results of research intended to promote a greater understanding of factors associated with change in state prison populations and expenditures at the state level by discussing developments in Kentucky between 1977 and 2005. We compare our state-level findings to Spelman's national-level results, to determine whether what holds nationally also proves true for the Commonwealth of Kentucky.

METHODS

We have duplicated Spelman's methodological approach, as much as possible, so that we can compare our results. Like Spelman, we investigate the effect of several influences on the dependent variables of prison capital spending and prison population. However, we differ in two ways from his approach, both in our general conceptualization and specific measurement of prison growth.

First, Spelman categorizes his measures of thirty-three independent variables into seven categories, with various subcategories. These are social threats (economic, underclass, and institutional), public opinion and politics (citizen ideology and party control), the electoral cycle (gubernatorial and presidential), crime rates (violent,

property, and drugs) prison crowding (jail, prison, other institutions), sentencing policy (habitual, TIS, presumptive and marijuana decriminalization laws), and institutional capacity (total state spending, mandatory state spending, prison capital spending). To avoid confusion, we will present our findings for Kentucky using these categories. However, they do not conform directly to the three conceptual perspectives that we describe in the preceding review of the literature, so for discussion purposes, we will group Spelman's seven categories and subcategories into the three general perspectives, as follows: social threats (crime, economic, and underclass threats), social structural dynamics (social inequality and institutional failure), and criminal justice policy (public opinion, politics, spending, and sentencing). These perspectives provide a framework for the discussion of our research findings.

Second, we do not use all of the thirty-three measures employed by Spelman, due to the fact that our single-state investigation results in a smaller sample size. The presidential election year variable does not apply to a single-state study and was therefore dropped. Some variables were excluded because they had no variance for the state of Kentucky. For instance, Spelman controlled for habitual offender laws, presumptive sentencing guidelines, litigation to reduce jail sentencing and marijuana decriminalization laws, all of which had no variance in the state of Kentucky over the study period. Additionally, there was no data available for number of persons doing time in institutions other than state prisons or local jails until 1998. Similarly, for the state of Kentucky, there was virtually no variance in the Republican control of the governorship (until 2003) and the house. While there was mixed control of the legislature, this occurred consecutively

during the last six years of the study. To resolve issues of multicollinearity, we dropped some of the measures employed by Spelman from our analysis. The change in the Hispanic population was highly collinear with changes in the African-American population. Therefore, this variable was dropped from the analysis.

Dependent Variables

We measure *prison capital spending* for Kentucky, which is the state's outlay for new construction, and for land and buildings acquired for use by the Corrections Department. Spending information was retrieved from the Annual Survey of Governments conducted by the U.S. Bureau of Census. We also measure the Kentucky's *prison population*. It reflects not only those incarcerated in state prisons but also convicted individuals completing their state sentences while housed in local and regional jails, federal and private prisons, and in other states. This information was retrieved from the U.S. Bureau of Justice Statistics.

Independent Variables

Table 1 lists those independent variables we have chosen for the prison capital spending and prison population regression models. We organize them into variable categories, and describe them as follows, with the source of each in parentheses. In the category of Economic Threat, we measure *GDP* which is Kentucky's the annual real gross domestic product (U.S. Bureau of Economic Analysis); *WAGES*, the annual real wages for Kentucky (Regional Economic Accounts published by the U.S. Bureau of Economic Analysis); *UNEMP*, Kentucky's annual average unemployment rate (U.S. Bureau of Labor Statistics); *POVERTY*, the proportion of Kentucky residents under the federal poverty threshold (U.S. Census Bureau). For Underclass

Threat, we measure *DROPOUT*, the ratio of 17-year old Kentucky residents who have graduated from high school, subtracted from 1 (Digest of Educational Statistics); *UNWED* which is a measure of the proportion of all children born to unwed mothers each year in Kentucky National Vital Health Statistics Reports); *FOOD*, an indicator of Kentucky real spending on the federal Food Stamp program administered by the U.S. Department of Agriculture (Regional Economic Accounts published by the U.S. Bureau of Economic Analysis); and *BLACK*, measuring the proportion of African-American residents in Kentucky (Annual Population Estimates from the U.S. Census Bureau). We use three measures of Institutional Threat: *ENROLLED* which is a measure of the proportion of children between the ages of 5 and 17 enrolled in public primary and secondary schools; *POLCHANGE* measuring the absolute value of change in the Republican proportion of the Kentucky legislature next year (Klarner, 2003, 2007); and *MHPOP*, measuring the rate of Kentucky mental hospital inpatients per 1,000 state residents (Raphael, 2000; the Center for Mental Health Services, U.S. Substance Abuse and Mental Health Services Administration). Our indicator of Public Opinion and Politics is *CONSERV*, which consists of a measure of Kentucky citizens' ideology using a binary index (Berry, Ringquist, Fording & Hanson, 1998; Fording, 2007). The Electoral Cycle measure is *GOVELEC*, which indicates the year in which Kentucky elects its governor (Klarner, 2003, 2007). For the category of Crime, we measure *VIOLENT*, which is Kentucky's annual violent crime rate per 1,000 residents (Federal Bureau of Investigation) and *DRUGS*, the rate of arrests for drug possession and trafficking per 1,000 Kentucky residents. Prison Overcrowding Conditions is measured

solely by *JAIL*, which is the number of convicted offenders serving state sentences in local jails due to overcrowding in Kentucky prisons per 1,000 residents (National Prison Statistics, U.S. Bureau of Justice Statistics). The category of Sentencing Policy is represented by *TRUTH*, a dichotomous measure of the presence or

absences of a Kentucky Truth in Sentencing Law (Sabol, et al., 2002; Kentucky State Statutes). Finally, Current Spending is reflected in *T. SPENDING*, which measures Kentucky’s real spending per capita for all state functions, i.e., operations and maintenance, capital outlays, and interest payments (Annual Survey of Governments).

Table 1. List of variables selected		Variable Description
Economic Threat	GDP	Gross Domestic Product
	WAGES	Personal Income Per Capita
	UNEMP	Annual Unemployment Rate
	POVERTY*	Proportion of persons below poverty
Underclass Threat	DROPOUT	Number of high school graduates
	UNWED	Proportion of unwed births
	FOOD*	Amount spent on Food programs by state
	BLACK*	Proportion of African Americans
Institutional Threat	ENROLLED	School Enrollment
	POLCHANGE*	Absolute Value of Change in Republicans
	MHPOP*	Institutionalized Mental Health Patients
Public Opinion and Politics	CONSERV	Conservative Ideology Index
Electoral Cycle	GOVELEC	Governor's Election Year
Crime	VIOLENT	Violent Crime Rate
	DRUGS	Narcotics arrest rate
Prison Crowding Conditions	JAIL	Prisoners in jail due to overcrowding
Sentencing Policy	TRUTH*	Truth in sentencing law
Current Spending	T. SPENDING*	Total State Spending

* Variables utilized for the prison population model

Like Spelman and others (e.g., Greenberg & West, 2001; Jacobs & Carmichael, 2001; Smith, 2004), we adopt the use of ordinary least squares regression analysis to estimate the effects of a number of social, political and economic factors on both prison capital spending and prison population, an approach that has been found to be effective in controlling random disturbances in the regression model over time (Murray, 2009). Also, we investigate which factors have short- and/or long-term effects on prison

populations for the same time period as Spelman; between 1977 and 2005. Also like Spelman we employ one-year lags of the predictor variables to provide for a reasonable estimation of the long-run equilibrium effects.

However, as mentioned earlier, there are several adjustments that are required as a result of the difference in scope between our Kentucky study and Spelman’s national study. First, as a result of examining only one of the fifty states under Spelman’s

study, our sample size is drastically smaller ($n = 26$) where the unit of analysis is a given year. Therefore, our study could not adopt all the independent variables ($k = 31$) used in Spelman's analysis. The number of parameters estimated must be less than the number of cases when using regression analysis. Second, three of the policy level variables used in Spelman's analysis, habitual offender, presumptive sentencing guidelines, and marijuana decriminalization, did not apply to Kentucky as a result of having no variance. Third, additional independent variables are dropped from our analysis because they cause problems association with multicollinearity. For example, the growth of the Hispanic population is highly correlated with the growth in the African-American population (Pearson's $r = .912$). Lastly, data for some variables is not available for a significant portion of the research time-frame. For example, data for the number of prisoners doing time in institutions other than state prisons and local jails is not available for the Kentucky for years prior to 1998, thus this variable was not included in the analysis.

Regression diagnostics were performed on the data to ensure that data met assumptions of normality, linearity, homoscedasticity, and autocorrelation. In order to normalize the data, all continuous level data were logged and then differenced. Taking the log of the data helps to correct for extreme values by using a common non-linear transformation. Differencing the data allows us to examine the changes in values over time from one year to the next. This allows us to regress short-run effects of changes in the predictor variables on to changes in each of the dependent variables. Regressing changes in the dependent variable on changes in the predictor variables also provides a simple fix to problems with spurious regression results

created when the variance of the dependent variable grows without bound over time (Granger & Newbold, 1974). The Durbin-Watson test was used to detect autocorrelation between the residual terms. The test statistics can vary between 0 and 4 with values close to 0 indicating positive correlation between adjacent residuals, and values close to 4 indicating negative correlations. Values close to 2 indicate uncorrelated residuals. The Durbin-Watson tests for our prison capital spending model is 2.023 and for our prison population model is 2.021, indicating uncorrelated residuals, thereby meeting the assumption of independent errors for both of our models. Visual inspection of the plots of standardized predicted values plotted against the residuals shows the assumption of homogeneity of variance met as well.

RESULTS

Prison Capital

For the Commonwealth of Kentucky, economic threats, sentencing policy, prison crowding conditions and public opinion were found to have a significant relationship with prison spending on capital outlays at the 90 percent confidence level or higher as shown in Table 2. In response to economic threats, prison capital spending increased as wages and unemployment both decreased. The decrease in wages is consistent with previous research. The negative relationship with unemployment suggests that increased state revenues from income taxes facilitate state spending. While spending was responsive to these economic threats, gross domestic product and poverty did not directly or indirectly impact decisions to increase spending on prisons.

A conservative political ideology in the state had a positive relationship with increases in prison capital spending, while Kentucky's state level election cycle did not.

This supports the work of Erikson, Wright and McIver (1989) that it is not the control of the party that impacts incarceration

budgets and decisions, but responsiveness of the party in control to the ideology of the state.

Table 2: Prison Capital Spending Regression Results

		<i>Coefficient</i>	<i>Standard Error</i>	<i>Bounds</i>
Economic Threat	GDP	0.528	0.616	(-0.155,1.110)
	Wages	-1.208**	0.431	(-1.365,-0.800)
	-	-	-	-
	Unemployment	2.736***	0.748	(-2.476,-1.137)
Underclass Threat	Poverty	0.138	0.666	(-0.547,0.538)
	Dropout	0.531	0.335	(0.006,0.576)
	Unwed	0.112	0.344	(-0.152,0.268)
	Food	-0.008	0.440	(-0.085,0.268)
	Black	0.792	0.586	(-0.211,0.918)
Institutional Threat	Enrolled	0.508	0.308	(0.045,0.569)
	Polchange	-1.166	0.648	(-1.286,0.019)
	Mental Health Pop.	-0.641	0.627	(-0.955,0.041)
Public Opinion and Politics	Conservative	0.520*	0.256	(0.283,0.566)
	Governor			
Electoral Cycle	Election	0.814	0.452	(-0.071,0.906)
Crime	Violent	-0.397	0.257	(-0.397,-0.090)
	Drugs	-0.272	0.407	(-0.435,0.057)
Prison Crowding conditions	Jail	0.671**	0.277	(0.371,0.671)
Sentencing Policy	Truth	-1.877*	0.831	(-1.904,0.204)
Current Spending	T. Spending	0.370	0.560	(0.114,0.665)
	N=	26		
	Model F	2.018		

*p≤.10, **p≤.05, ***p≤.01

Both jail overcrowding and the implementation of truth in sentencing policies were conscious decisions that influenced prison spending. As expected, when jail overcrowding increased, the prison capital outlays increased as well to deal with the crowding situation. The implementation of TIS policies was inversely associated with capital outlays on prisons.

Crime, current spending and the underclass threat did not prove to hold a relationship with prison outlays. Prison capital spending was not responsive to changes in the violent crime rate or to narcotic drug arrests, as expected from the literature. Total spending on functions did not impact the spending on prisons, an interesting policy indicator. The presence of the underclass, as captured by measures of

race, out of wedlock births, divorce rates and educational attainments had no relationship with the decision to increase or decrease capital outlays on prisons.

Examining the coefficients alone provides a complex understanding of Kentucky's capital expenditures for prisons. To simplify this, Spelman conducts an analysis of national data for his data categories, described earlier. By integrating multiple variables within a single categorical measure, results emerge that are simpler to interpret, but might not reflect the importance of single measure within the category. Employing the same approach, Table 3 shows that five specific variables, grouped into four of the different categories, were found to be significant to capital spending in Kentucky. Nine separate regressions were run by removing all covariates in each of the nine separate categories. Comparing the changes in R^2 provides an estimate of the explanatory power of the category removed. Categories that, when removed, greatly decrease the model's R^2 can be said to be better predictors of capital expenditures for prisons. When each group of categories was separately removed from the regression model, economic threats had the greatest impact on prison capital explaining 36.57 percent of the change in the model's R^2 . Institutional threats accounted for 12.01 percent of the change, prison overcrowding 11.83 percent and sentencing policies as 10.23 percent, with current spending having the least impact.

Prison Population

Like Spelman, the model for prison population measures short-term, long-term, and combined impacts. Our model also restricts the number of lags in the independent variable to one in order to use an error correction mechanism, as conducted by Spelman. We assume there is a long-run

equilibrium and one year lags of the dependent variable and all covariates represent the long-run equilibrium effect. Additionally, capital spending for prisons enters the model the dynamic portion of the model as a moving average of four lags. As a result of the error correction term, the model includes covariates and a one-year lag. Again, the problems associated with degrees of freedom limits our analysis to a smaller number of covariates and their lags than was used in the first model.³

The only immediate influence on the prison population for the Commonwealth of Kentucky is an increase in poverty significant at the 99 percent level as indicated in Table 4. Spending on the food stamp program, the proportion of the black population, change in the proportion of Republican seats, the mental health population, truth in sentencing laws and total spending proved to have no immediate effect on the prison population.

³ Variables were selected into the model using the following procedure. First, two backwards regressions were run, one with all immediate-effects covariates (no lags) and one with the long-term effects covariates (one-year lag). The backwards regression method eliminates the least significant variable in the model and runs a new regression. The result is a number of models with one covariate eliminated each step of the way. Second, variables that were included in the first significant model ($p(F) < .05$) in both the short-term and long-term models were included in the final model. This model contained both total government spending and mandatory government spending, but suffered from collinearity issues. To eliminate multicollinearity, mandatory spending was dropped.

Table 3. Predictive Power of Kentucky's Prison Capital Spending

	κ vars	R ²	F	p(F)	Shrunk Δ R ²	% total
Include all covariates:	18	0.865				
Remove:						
Economic threats	4	0.45	0.56	0.85	0.41	36.57
Underclass threats	4	0.79	2.43	0.08	0.08	7.12
Institutional threats	3	0.73	1.52	0.27	0.14	12.01
Opinion and politics	1	0.77	1.31	0.38	0.09	8.36
Electoral cycle	1	0.79	1.48	0.31	0.07	6.58
Crime	2	0.79	1.81	0.2	0.07	6.41
Prison crowding	1	0.73	1.06	0.5	0.13	11.83
Sentencing policy	1	0.75	1.17	0.44	0.12	10.23
Current Spending	1	0.86	2.29	0.13	0.01	0.89
					1.12	100

When lagged for one year, total state spending and proportion of the state population that are African-American have a significant long-term effect on the state imprisonment rate. Change in political parties and Kentucky's mental health inpatient population hold long-term negative relationships with the prison population. The significant relationship with total spending holds true for the

combined effect, illustrating the overall importance of total state spending with the prison population. Poverty had an immediate impact, but no relationship with the prison population in the long run. Spending on food programs, the mental health population and truth in sentencing policies had no impact on the prison population in the short- or long-term.

Table 4. Prison Population Regression Model Results

	Immediate	Long Run Equilibrium	Combined Effects	Specification Limits
Poverty	1.014 (.281)***	0.516 (.338)	-0.498 (.440)	(-1.064, 0.870)
Food	0.076 (.194)	0.140 (.226)	0.216 (.420)	(-0.180, 0.192)
Black	-0.043 (.217)	0.399 (.204)*	0.456 (.421)	(-0.301, 0.399)
Polchange	0.094 (.239)	-0.481 (.232)*	-0.387 (.333)	(-0.519, 0.197)
Mhpop	0.334 (.273)	-0.203 (.296)	0.131 (.403)	(-0.453, 0.596)
Truth	0.676 (.476)	0.330 (.374)	1.006 (.605)	(0.006, 0.711)
T. Spending	-0.614 (.354)	0.910 (.325)**	-1.524 (.481)**	(-0.910, -0.284)

*p \leq .10, **p \leq .05, ***p \leq .01

Using the same approach employed in the analysis of prison spending, we removed variables from the regression to determine their explanatory power, poverty had greatest impact on the Model R^2 ,

accounting for 26.74 percent, followed by the 19.85 percent accounted for by total spending, and change in the Republican seats accounting for 17.29 percent of the change (Table 5).

Table 5. Predictive Power of Kentucky’s Prison Population

	F	Model R^2	ΔR^2	% of Total
Include all Covariates	2	0.78		
Variable Eliminated				
Poverty	0.56	0.42	0.37	26.74
Food	2.63	0.77	0.01	0.81
Black	1.53	0.66	0.12	8.86
PolChange	0.94	0.55	0.24	17.29
Mhpop	2.02	0.72	0.06	4.54
Truth	1.16	0.6	0.19	13.55
T. Spending	0.82	0.51	0.27	19.85
Prison Capital MA	1.34	0.67	0.11	8.35
			1.37	100

DISCUSSION: The Growth of Kentucky’s Prison Capital Spending and Population

The prison boom in Kentucky can be understood, in relation to that for the nation as a whole, at a conceptual level using the three perspectives identified in the background section and in a more targeted fashion using the measures employed in our, and Spelman’s, data analysis.

General Perspectives

Our findings in Table 3 show that the growth of prison capital spending in Kentucky is associated with measures each of the general perspectives proposed in the literature as explanations for the prison boom, namely social threat (economic threats), criminal justice policy (sentencing policies, prison overcrowding, and public opinion) and structural dynamics (threats to school and mental health social support

institutions) perspectives, in order of influence. In terms of Kentucky’s growing prison population, Table 5 shows that measures of the social threat (economic threat), criminal justice policy (spending, sentencing policies), and structural dynamics (institutional threat) perspectives are significantly associated. This differs from Spelman’s conclusions for the nation as a whole, in that he found no association between measures of social structural dynamics and either prison spending or populations.

Specific Indicators

Prison spending. There were some specific points at which the findings of Spelman’s national analysis and our examination of Kentucky converge. Both studies find that prison capital spending is significantly influenced by the public’s conservative ideology, jail overcrowding

and unemployment. Some of the independent variables that Spelman find are significantly associated with prison spending were not included in our analysis, so it is not possible to determine the similarities between Kentucky and the nation on those factors. On the other hand, wages and truth in sentencing laws were important predictors of prison spending in Kentucky, while these were not significant in Spelman's national analysis (although they varied in the same direction), and Spelman's finding that GDP is positively associated with prison spending nationally was not sustained in our examination of prison spending in Kentucky. Our predictive model for prison spending found that the greatest influences on capital spending were economic threats, followed by institutional threats, prison crowding, and sentencing policies, respectively. For Spelman, the most important explanatory factor is public opinion and politics, followed in order by current state spending and economic threats.

Prison populations. In estimating what might be influencing prison population growth, the only variable that has an immediate effect in Kentucky is the proportion of residents living below the poverty line. Spelman did not find this to be a strong explanatory variable, but rather that wages, property and drug crimes, presumptive sentencing and decriminalization of marijuana offenses, previous capital spending total state spending, and mandatory spending had an immediate and significant effect on imprisonment rates.

The proportion of Kentucky's population that is African-American, change in Republican control of the legislature, and total state spending were significant predictors of prison growth in the long term. Spelman found none of these variables to be significant long-term predictors, but rather

implicated violent and drug crime rates, truth in sentencing and presumptive sentencing laws, and the decriminalization of marijuana offenses. Our predictive model placed the greatest influence on poverty rates, followed by total state spending, political change, and truth in sentencing laws in explaining change in Kentucky's imprisonment rate. On the other hand, Spelman concludes that the best predictors of national imprisonment rates are crime rates, previous capital spending, current total state spending, sentencing policies, and economic threats, respectively.

CONCLUSION

Gottschalk states that the greatest contribution that Spelman makes in his research "may be the compelling challenge he lays down to the 'root causes' approach to ending the prison boom... by ameliorating structural problems like rampant poverty, high unemployment, dysfunctional schools, an abysmal health-care system, and outcomes dramatically stratified by race." (2009: 106-107). In a practical sense, altering criminal justice policies might produce more rapid reductions to the prison enterprise, but focusing on policy alone overlooks the direct and indirect influence of structural factors on the growth of prisons in particular regions or states.

In applying Spelman's approach as closely as possible, we find substantial differences in what has influenced prison spending and growth in the era of mass incarceration between Kentucky and the nation as a whole. Kentucky has historically been represented by influences characterized in this research as problematic social structural dynamics, including low levels of educational participation and attainment, reliance on social welfare that has been curtailed in recent years, and high rates of

divorce rates and single parenting. In addition, Gottschalk suggests that poverty, unemployment, and racial complications can be considered “structural problems” and while Spelman categorizes these as social threats, Kentucky certainly is beset by high rates of poverty and unemployment, and has a higher proportion of African-American residents than the national average.

We also suspect that the differences in Spelman’s national analysis and our findings for Kentucky is related to the differences in political processes and implementation of specific criminal justice laws and administrative procedures between states that is well described by Barker (2009). In merging information for the entire nation, Spelman is unable to capture the particular strategies and styles used in each state. Two examples illustrate this point. First, Kentucky has had a unique history in the application of its Persistent Felony Offender Act. Vito and Wilson (1990) find that after the law was implemented in 1974, state circuit court judges imposed the sentencing enhancement inconsistently: those to whom the enhanced sanction was applied were sentenced to terms that were 40 percent longer than those who had committed a similar number of offenses but did not receive the enhanced penalty, and that African-Americans were more likely to receive the enhancement. While not defending the inequity in sentencing by race, Vito and Wilson predicted that applying the law in all eligible cases would place an immense strain on the state’s resources. Second, and as noted earlier, most research finds a positive association between prison admission rates and control of the legislature and governor’s office by Republican Party, because it is the more conservative party. However, Caplow and Simon (1999) and Western (2006) indicate that in Kentucky and similar states the political party in

control is not a strong influence on prison growth because there is little difference between Republican and Democratic positions on crime and punishment.

From this study of factors influencing mass incarceration in a single state we conclude that there has been no single prison boom in America, but rather fifty distinct prison booms, and that the particular combination of conditions that have resulted in prison growth must be understood to develop effective strategies to curtail states’ excessive and unnecessary spending and incarceration of its citizens. This conclusion suggests the need for a very active research agenda which involves an analysis of the relative influence of the explanatory variables discussed here on a state-by-state basis. Another research approach is to investigate the relative influence of these variables over time; we suspect that measure of crime and other social threats were more influential in the early years of the imprisonment boom, while criminal justice policies later grew more influential. Also comparison of states grouped by regions of the country or by rates of growth in prison spending and imprisonment rates could also yield important results towards understanding mass incarceration in America.

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