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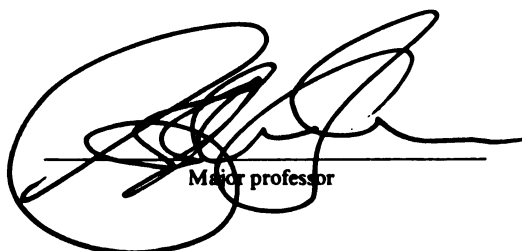
**UNDERSTANDING BUDGETARY PRIORITIES:
APPROPRIATIONS FOR CORRECTIONS AND HIGHER EDUCATION**

presented by

Matthew Kleiman

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Political Science



Major professor

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**UNDERSTANDING BUDGETARY PRIORITIES:
APPROPRIATIONS FOR CORRECTIONS AND HIGHER EDUCATION**

By

Matthew Kleiman

A DISSERTATION

**Submitted to
Michigan State University
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ABSTRACT

UNDERSTANDING BUDGETARY PRIORITIES: APPROPRIATIONS FOR CORRECTIONS AND HIGHER EDUCATION

By

Matthew Kleiman

Budgets themselves represent the endgame of a struggle for scarce resources that reflect government priorities. This dissertation seeks to identify the factors that are responsible for determining the level of appropriations for discretionary budgetary categories that are in competition with one another. To accomplish this the impact of endogenous and exogenous factors, the size of the budgetary pie, competition from other budgetary categories, and specific public policies are examined. More specifically the focus is on appropriations for corrections and higher education in California, Michigan, and Virginia between Fiscal Year's 1970-1999. Considerable attention is devoted to outlining a suitable methodology (2SLS and SUR) for addressing whether there is a tradeoff between these two budgetary categories. In addition, recent sentencing policy reforms and the resultant shift away from indeterminate sentencing and rehabilitation towards determinate sentencing is addressed. It is found that the confluence of exogenous factors and the implementation of specific sentencing policies (e.g., truth in sentencing, determinate sentencing, mandatory minimums, and repeat offender legislation) have been responsible for the rapid increase in appropriations for corrections. In sum, this analysis contributes to the theoretical understanding of the budgetary process and to the understanding of how the implementation of sentencing policies have led to increased pressures on state budgets.

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To my Mom and Dad: my biggest supporters, without whom I would have never made it
this far.

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Four strong winds that blow lonely
Seven seas that run high
All those things that don't change
Come what may
If the good times are all gone
Then I'm bound for moving on
I'll look for you if I'm ever back this way (Neil Young, 1978)

TABLE OF CONTENTS

LIST OF TABLES	ix
LIST OF FIGURES	xi
CHAPTER 1	1
Expansion of the State Prison System	1
An Introduction to Sentencing Reforms	4
A Changing Social Policy Trajectory	6
Overview of Dissertation	8
CHAPTER 2	11
Tradeoffs	12
Budgetary Decisionmaking	16
Exogenous Factors	17
Policy Changes in Corrections	20
Stages of the Criminal Justice System	26
Overview of Study	32
CHAPTER 3	35
Theoretical Hypotheses	35
Budgetary Tradeoffs	36
Tradeoff Hypothesis	37
Incrementalism	37
Incrementalism Hypothesis	37
Exogenous Factors	39
Exogenous Hypothesis	40
Budgetary Pie	40
Budgetary Pie Hypothesis	42
Public Policies	42
Policy Hypothesis	42
Model and Statistical Hypotheses	43
Data Source	44
Operationalization and Data Sources	46
Appropriations	48
Exogenous Factors	52
Violent Crime Rate	52
Enrollment	53
Cohort	53
Political Ideology	53
Unemployment	54
Overview of Budgeting Patterns In California, Michigan, and Virginia	55
California – Appropriations	55

Michigan – Appropriations	57
Virginia – Appropriations	60
Estimation Strategy	63
Time Series Issues – Lags	68
Time Series Issues – Stationarity	70
Estimation Strategy – Overview	75
Anticipated Conclusions	82
 CHAPTER 4	 84
California – Policies	84
California – Prison Population	89
California – Independent Variables – Governors	90
California – Independent Variables – Unemployment Rate	90
California – Independent Variables – Violent Crime Rate	91
California – Independent Variables – Cohort	92
California – Independent Variables – Enrollment	93
California – Correlation Matrix	94
California – Two Stage Least Squares	96
California – Seemingly Unrelated Regressions	100
 CHAPTER 5	 111
Michigan – Policies	111
Michigan – Prison Population	115
Michigan – Independent Variables – Governors	116
Michigan – Independent Variables – Unemployment Rate	117
Michigan – Independent Variables – Violent Crime Rate	118
Michigan – Independent Variables – Cohort	119
Michigan – Independent Variables – Enrollment	120
Michigan – Correlation Matrix	121
Michigan – Two Stage Least Squares	123
Michigan – Seemingly Unrelated Regressions	128
 CHAPTER 6	 135
Virginia – Policies	135
Virginia – Prison Population	140
Virginia – Independent Variables – Governors	141
Virginia – Independent Variables – Unemployment Rate	142
Virginia – Independent Variables – Violent Crime Rate	143
Virginia – Independent Variables – Cohort	144
Virginia – Independent Variables – Enrollment	145
Virginia – Correlation Matrix	146
Virginia – Two Stage Least Squares	148
Virginia – Seemingly Unrelated Regressions	153
 CHAPTER 7	 161
Policy Windows and Changes in Correction’s Policy	164

Policies as a Pendulum.....168

Intermediate Sanctions.....170

REFERENCES173

LIST OF TABLES

Table 3.1: Statistical Hypotheses	44
Table 3.2: Operationalization.....	47
Table 3.3: Desideratum of Appropriations	49
Table 3.4: Appropriations Data – Title, Source, and Notes About the Data	51
Table 3.5: Augmented Dickey-Fuller Test: Unemployment Rate in California.....	74
Table 4.1: California Determinate Sentencing terms (SB 42)	86
Table 4.2: Correlation Matrix for Variables included in the Budget Model, California	95
Table 4.3: Unit Root Tests (ADF)	97
Table 4.4: Two Stage Least Squares – Levels and Differenced, California	98
Table 4.5: Seemingly Unrelated Regression, Corrections in California.....	101
Table 4.6: Seemingly Unrelated Regression, Higher Education in California	102
Table 4.7: Seemingly Unrelated Results (Breusch-Pagan Test), California.....	104
Table 4.8: Triangulation of Estimates in California	105
Table 4.9: Predicted Values for Appropriations for Corrections (in billions)	110
Table 5.1: Correlation Matrix for Variables included in the Budget Model, Michigan	122
Table 5.2: Unit Root Tests (ADF)	123
Table 5.3: Two Stage Least Squares (robust) – Levels and Differenced, Michigan	126
Table 5.4: Seemingly Unrelated Regression (differences), Michigan.....	129
Table 5.5: Seemingly Unrelated Results (Breusch-Pagan Test), Michigan.....	129
Table 5.6: Triangulation of Estimates in Michigan	130
Table 5.7: Predicted Values for Appropriations for Corrections (in millions)	134

Table 6.1: 1975 Virginia Sentencing Schema.....	136
Table 6.2: Correlation Matrix for Variables included in the Budget Model, Virginia	147
Table 6.3: Unit Root Tests (ADF)	149
Table 6.4: Two Stage Least Squares (robust) – Levels and Differenced, Virginia	151
Table 6.5: Seemingly Unrelated Regression, Virginia	154
Table 6.6: Seemingly Unrelated Results (Breusch-Pagan Test), Virginia.....	155
Table 6.7: Triangulation of Estimates in Virginia	156
Table 6.8: Predicted Values for Appropriations for Corrections (in millions).....	160
Table 7.1: Summary of State Reforms (dates implemented).....	164

LIST OF FIGURES

Figure 1.1: State Prison Population, 1930-1999	2
Figure 2.1: Budget Line and the Tradeoff Between Goods	14
Figure 2.2: Stages of the Criminal Justice Process and Policies that Impact State Incarceration Rates.....	27
Figure 2.3: Supply and Demand for Prison Beds	30
Figure 2.4: Supply and Demand for Higher Education	32
Figure 2.5: The Budgetary Process.....	34
Figure 3.1: Budgets as an expanding-sum game	41
Figure 3.2: State of California: Corrections and Higher Education Appropriations (GF):FY 1969-1999	56
Figure 3.3: State of California: Percent of Appropriations from Total State Appropriations (GF): FY 1969-1999	57
Figure 3.4: State of Michigan: Corrections and Higher Education Appropriations (GF/GP): FY 1969-2000	58
Figure 3.5: State of Michigan: Percent of Appropriations from Total State Appropriations (GF/GP): FY 1969-2000.....	59
Figure 3.6: State of Virginia: Corrections and Higher Education Appropriations (GF): FY 1971-1999	61
Figure 3.7: State of Virginia: Percent of Appropriations from Total State Appropriations (GF): FY 1971-1999	62
Figure 3.8: An Illustration of Time and the Budgetary Cycle, Appropriations and Expenditures.....	69
Figure 3.9: Illustration of Stationarity via Differencing: Enrollment in California.....	74
Figure 3.10: Overview of Estimation Strategy	76
Figure 4.1: Number of Prisoners Under State Jurisdiction in California: 1971-1997	89
Figure 4.2: State of California: Unemployment Rate, FY 1970-1999.....	91

Figure 4.3: State of California: Violent Crime Rate (Part I offenses known to police per 100,000 inhabitants), FY 1968-1999	92
Figure 4.4: State of California: 18-24 year old cohort, FY 1968-1999	93
Figure 4.5: State of California: Enrollment in Higher Education, FY 1970-1999	94
Figure 5.1: Number of Prisoners Under State Jurisdiction in Michigan: 1971-1997	116
Figure 5.2: State of Michigan: Unemployment Rate, FY 1970-1999.....	118
Figure 5.3: State of Michigan: Violent Crime Rate (Part I offenses known to police per 100,000 inhabitants), FY 1970-1999	119
Figure 5.4: State of Michigan: 18-24 year old cohort, FY 1970-1999	120
Figure 5.5: State of Michigan: Enrollment in Higher Education, FY 1970-1999	121
Figure 6.1: Number of Prisoners Under State Jurisdiction in Virginia: 1971-1997	141
Figure 6.2: State of Virginia: Unemployment Rate, FY 1970-1999.....	143
Figure 6.3: State of Virginia: Violent Crime Rate (Part I offenses known to police per 100,000 inhabitants), FY 1970-1999	144
Figure 6.4: State of Virginia: 18-24 year old cohort, FY 1970-1999	145
Figure 6.5: State of Virginia: Enrollment in Higher Education, FY 1970-1999	146

CHAPTER 1

State legislators and governors are engaged in a continuous process of defining what priorities state governments should focus on and address. States may choose to focus on or emphasize issues relating to criminal justice, education, health care, transportation, etc... This process of setting priorities manifests itself in the realm of budgeting where certain programs and departments are given greater state resources to address what are deemed as problems. Given a limited set of resources, states cannot address all problems; therefore, they must choose which areas will be given priority. This dissertation will focus on how budgetary appropriations are determined and more specifically examine the recent increases in budgetary appropriations for corrections and the potential tradeoff that might exist between this budgetary category and higher education.

Expansion of the State Prison System

In recent years states have seen a radical growth in the size of the prison population and in the incarceration rate. In 1930 the state prison population of the United States stood at 117,000 and grew at a relatively constant rate through 1970, when the prison population stood at roughly 175,000 (See Figure 1.1). However, between 1970 and the turn of the century the prison population grew rapidly and swelled to over 1.1 million prisoners (Langan, Fundis, and Schneider 1988; Beck and Karberg 2001).¹ This rapid growth is mirrored in the incarceration rate, which is the number of inmates in jail

¹ The Postsecondary Education Opportunity (1997) notes that between 1925 and 1973 the prison population of the U.S. increased on average 2,333 prisoners per year, while between 1973 and 1995 there was an average increase of 48,900 prisoners per year.

and prison per 100,000 U.S. residents. In 1930 the incarceration rate stood at 146 and rose to 167 in 1970. This rate increased to 461 in 1990 and 703 in 2000 (Ziedenberg and Schiraldi 2000). Despite the large aggregate increase, the incarceration rate varies considerably across the different states with Texas having the highest rate of 1,014 inmates per 100,000 residents, California a rate of 721, Virginia 713, Michigan 628, and Vermont the lowest among the states at 203 in midyear 1999. Additionally, by years end 2000, the United States had almost 2 million people incarcerated in its prisons and jails and had the highest incarceration rate of any nation in the world (Sentencing Project

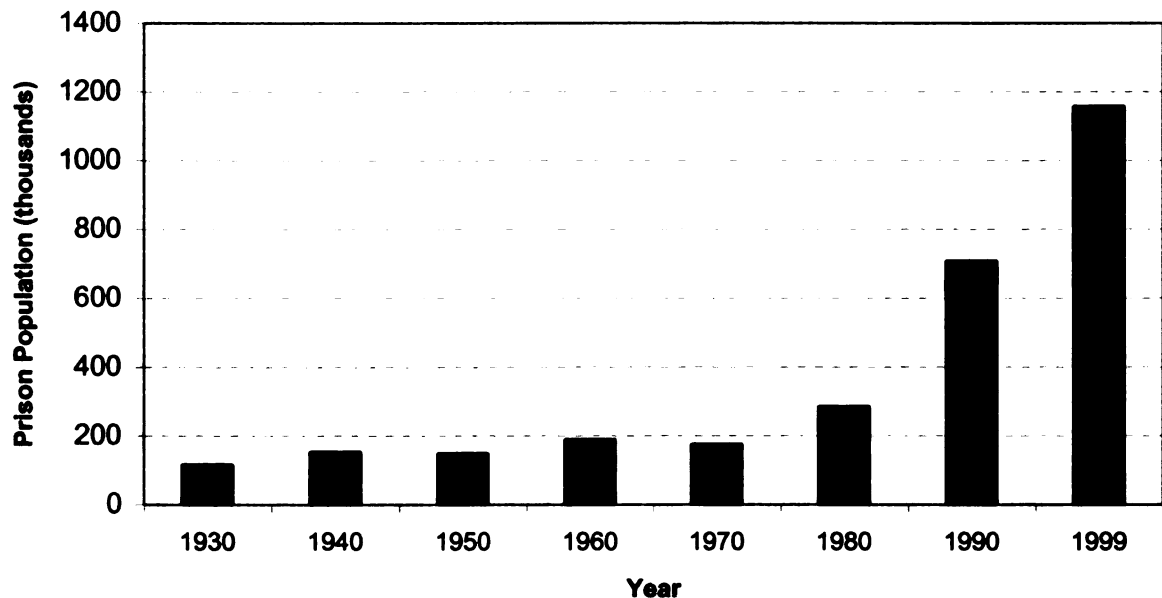


Figure 1.1: State Prison Population, 1930-1999

2001). In comparison, Russia had an incarceration rate of 675, South Africa 400, the United Kingdom 125, France 90, and Japan 40.² It has been projected that the U.S., which has 5% of the world population, will have a quarter of the world's prisoners at years end 2000 (2 million of the world's total of 8 million) (Ziedenberg and Schiraldi 2000).

This unprecedented expansion can be seen in California where the number of state prisoners grew from approximately 17,000 in 1971 to over 157,000 in 1997. To accommodate these increases California built 21 new prisons over this period and hired almost 25,000 new employees to help manage and maintain prison operations. This rapid expansion led California and other states to dramatically increase the portion of the budget designated for corrections. For example, in Fiscal Year (FY) 1969 California appropriated 161 million dollars from the general fund for corrections, which represented approximately 3.7% of the entire general fund state budget. In contrast, in FY 1999 California appropriated 4.7 billion dollars for corrections or 7.4% of the entire general fund budget (California Postsecondary Education Commission). Similarly, Donziger (1996) notes that between 1979 and 1990, state government expenditures rose 325 percent for prison operations and 612 percent for prison construction (48). These major changes, that were mirrored nationwide, led William Gregory to comment that "the most frequently cited concern in state government of late is the 'crisis in corrections.' The 'crisis' is the dramatic increase in prison population coupled with soaring prison

² The Russian rate of incarceration is calculated for September 2000, while for the other nations they were collected on varying dates within the period 1997 through 1999 (Sentencing Project, p. 3).

construction and operating costs that are now destabilizing state budgets” (Gregory, 1).³

The questions that arise from the discussion above are what factors have contributed to this unprecedented growth and what impact have these changes had on state allocations of monies for corrections and other budgetary categories?

An Introduction to Sentencing Reforms

Prior to 1970, indeterminate sentencing characterized the approach to sentencing prevalent in all of the states. Alan Dershowitz states that indeterminate sentencing represented “a continuum of devices designed to tailor punishment, particularly the duration of confinement, to the rehabilitative needs and special dangers of particular criminals” (Miller, Roberts, and Carter 1981, 1). Under most indeterminate sentencing procedures, the trial judge and parole board shared responsibility for determining the actual sentence served by a convicted offender. However, beginning in the early 1970’s this approach to sentencing came under attack. Indeterminate sentencing was viewed as according too much discretion to decision makers that could result in disparity in the time served by offenders based on racial, ethnic or class biases. Miller, Roberts and Carter (1981) suggest that “indeterminate sentencing practices based on the principle of rehabilitation appear to lack objective standards or principles to guide decisionmakers and are thus believed to be related to unjustified sentencing disparity and ineffective sanctions” (6). In addition, many critics felt that the actual time under indeterminate sentencing was too short and the punishment often did not meet the crime (von Hirsch 1976). Tonry and Hatlestad (1997) note that indeterminate sentencing was commonly

³ The rapid increase in the number of prisoners led to overcrowding in the prisons. For example, at the end of 1992 75% of all state prisons were operating over their maximum capacity. California operated at 91% over capacity, Ohio 77%, Michigan 44%, and Virginia 39%.

disparaged as ‘bark-and-bite sentencing,’ where the judge’s ten year bark often resulted in a one-to three-year bite (6). Finally, the idea that offenders could be rehabilitated was challenged by a 1974 report by Robert Martinson, that reviewed 200 prison programs, and found ‘little value’ in rehabilitation (Clark, 109). The end result was a national movement that shifted away from indeterminate sentencing towards retribution, just deserts, and determinate sentencing.

Determinate sentencing schemes establish standards or guidelines that dictate how much punishment convicted offenders should receive. They generally establish a set amount of time that offenders must serve for particular offenses while removing the discretionary element of sentencing that characterized indeterminate sentencing. The acceptance of determinate sentencing resulted in the abolition of parole, the adoption of sentencing guidelines, mandatory minimums, truth in sentencing, and three strikes and you’re out policies in the states. These changes represented a radical departure from past practice. Messinger and Johnson note that

law is constantly changing, but the change is usually evolutionary and incremental. Occasionally, a statute or judicial decision breaks abruptly with the past, announcing not only a set of new rules but also a new philosophical approach, indicating a change in the way the opinion leaders of society are thinking about a longstanding problem (13).

The implementation of determinate sentencing was just such a shift and signaled an era of ‘tough on crime’ policies and harsher penalties for offenders.

The shift towards determinate sentencing significantly altered the time served by offenders and the size of the prison population. The new policies directly led to increases in the number of offenders committed to prison, the length of imposed sentences, and the time served. The innovations in sentencing and the adoption of numerous sentencing

reforms led to a large increase in the number of offenders in prison and hence the size of corrections budgets necessary to build and maintain prison facilities.

The growing enthusiasm for ‘tough on crime’ policies that favored incarceration significantly increased the amount of monies allocated towards corrections. The Postsecondary Education Opportunity (1994) argued that the policy changes not only increased the share of budgets going to corrections but also adversely impacted spending on other budget areas. They suggest that the shift to determinate sentencing

led to an ever-growing share of state budgets allocated to the construction and operations of prisons. The increased share of state budgets for prisons means that some other state activity is receiving a smaller share of state budgets ... the share of social resources allocated to higher education has shrunk while the share allocated to prisons has increased. And as state financial support for public higher education has shrunk, tuition charges to students have increased to offset the loss of state support (7).

The concern for potential tradeoffs between increases in state spending on corrections and other budgetary categories, especially higher education, has been echoed by other scholars.

A Changing Social Policy Trajectory

The movement towards determinate sentencing and ‘tough on crime’ policies represents a reprioritizing of concerns for state governments. This is reflected in the increased share of state budgets that are designated for corrections. According to Layzell and Lyddon “a budget turns out to be a political document that reflects the values, vision, mission and purpose of an organization” (xix). Viewed in this light public budgeting systems are systems for making choices of ends and means, where the budget represents an audit of the activities and priorities of government (Lee and Johnson 1998). In this

sense, the increases are a reflection of the growing importance placed on the punishment of crimes. Donziger (1996) notes that “politicians at every level – federal, state, and local – have measured our obsession, capitalized on our fears, campaigned on ‘get tough’ platforms, and won” (2). As a result, politicians have passed laws requiring harsher sentences that have directly led to an expansion of the prison system. These changes have not come without significant consequences.

Macallair, Taqui-Eddin, and Schiraldi (1998) note that in 1995 states spent more building prisons than colleges for the first time. They state that there was

nearly a dollar-for-dollar tradeoff between corrections and higher education, with university construction funds decreasing by \$954 million (to 2.5 billion) while corrections funding increased by \$926 million to (2.6 billion). Around the country, from 1987 to 1995, general fund expenditures for prisons increased by 30%, while general fund expenditures for universities decreased by 18% (1).

The decline in monies for higher education can also be seen in California where general fund appropriations declined from 16.8% (\$733 million) of the total state general fund budget to 12.6% (\$8 billion). Gottfredson (1995) suggests that the relationship between increases for corrections and decreases in higher education could be viewed as ‘pretty direct.’ He cites that in California state spending for corrections increased 25 percent from FY 1991 through FY 1994, while funds for higher education declined by 25 percent. Furthermore, the Postsecondary Education Opportunity (1994) note that “[a]bout half of the increased costs of incarceration are being financed by states shifting resources out of higher education and into prisons.” They report that between 1980 and 1992 the increased share of state taxes allocated to corrections meant that \$9.5 billion had been shifted from other state activities into corrections. During this same period of time, there

was a approximately a \$4.6 billion reduction in public higher education's share of state taxes (13).

Overview of Dissertation

This dissertation examines the factors that have had a direct impact on the budgetary expansion in corrections. It also investigates whether a tradeoff exists between appropriations for corrections and appropriations for higher education. In order to accomplish these tasks, issues relating to the construction of budgetary theories will be explored and outlined. This dissertation is fashioned around two complimentary perspectives. The first perspective approaches the issues at hand as a student of budgeting, with the aim of building upon and advancing previous theoretical constructs of budgeting. The second perspective approaches the issues as a policy analyst with the aim of examining the impact that the implementation of new sentencing policies has had on state budgets. This dissertation is organized as follows:

Chapter 2 provides a general overview of budgetary theory and presents the context within which budgeting for corrections will be examined. The chapter begins by examining the theoretical literature surrounding budgeting. This includes literature relating to tradeoffs (guns/butter), incrementalism, and the influence of exogenous factors. Discussions of both bottom-up and top-down perspectives on budgeting are covered. Additionally, the shift from indeterminate sentencing to determinate sentencing is covered. This includes a historical look at the genesis of various determinate sentencing policies in different states. From there the influence of the policy changes on sentencing length and incarceration is discussed. It is shown that these new policies

directly impact the sanctioning phase. Furthermore, a supply/demand framework is explicated that provides a construct within which to understand how an increase in demand for prison space leads to greater appropriations for corrections. Finally, a diagram of the budgetary process is presented that links the various theoretical frameworks of budgeting into one holistic framework that serves as a springboard for the research questions that will be explored in this dissertation. These include questions about tradeoffs between appropriations on corrections and appropriations on higher education at the state level; the extent that this year's budget is a function of the previous year's budgetary base; the role of exogenous factors in the final budgetary allocations to various categories of expenditure; how traditional incremental models need to be adjusted to accommodate for an expanding or declining budgetary pie; and the extent to which specific policies that are formulated outside of the budgetary realm have an impact on budgetary allocations.

Chapter 3 provides an overview of the research design constructed to answer the questions laid out in the previous chapter. This includes the construction of theoretical and statistical hypotheses, the specification of an empirical model, and a discussion of the operationalization of concepts, data sources, and case selection. Furthermore, a summary of the budgeting patterns in California, Michigan, and Virginia is outlined. This discussion centers around the size of general fund appropriations for corrections and higher education and the size of the budgetary pie for FY's 1970-1999. From there the various issues and technical procedures surrounding estimation are covered. This includes a focus on issues of simultaneity, lagged variables, stationarity, multicollinearity, heteroskedasticity, and autocorrelation. Two paths for estimation are

selected. The first treats the data in levels and the other in differences. The estimation procedures for each path are laid out and a discussion of the rationale for competing approaches and how to choose between the two is provided. The chapter concludes by listing the anticipated conclusions of the dissertation.

Chapter 4 utilizes California as a case study to test the tractability of the research design outlined in the previous chapter. The chapter begins with an overview of correctional policy changes and reforms that occurred in California beginning in 1917. This discussion is followed by a brief review of the contextual background in California during the time period of investigation (1970-1999). This includes focusing on the number of prisoners under state jurisdiction in California, the unemployment rate, the violent crime rate, the size of the 18-24 year old cohort, the enrollment rate in higher education, and a listing of governors. From there the estimation procedures as outlined in the previous chapter are implemented and the various hypotheses tested. The chapter concludes with a discussion of the implications of the statistical results. Chapter 5 and Chapter 6 follow the same format as Chapter 4, but focus on Michigan and Virginia, respectively.

The concluding chapter, Chapter 7, summarizes the results found in the empirical chapters 4-6. In addition, some of the recent state responses to rising prison populations and their potential impact on state budgets are discussed. The primary focus will be on the national movement towards intermediate sanctions and Virginia's recent experiment with risk assessment and the diversion of nonviolent offenders to alternative sanctions away from prison.

CHAPTER 2

In 1940, V.O. Key asserted that a theoretical understanding of budgeting did not exist. He proclaimed that scholars needed to break from the confines of an institutional framework and generate a general understanding of budgetary behavior (Key 1940). Key recognized that budgeting operates within a realm of scarce resources and wished to understand the process whereby scarce means are allocated to alternative uses (1138).

Since Key's proclamation, there has been a vast array of studies aimed at filling this theoretical void (e.g., Wildavsky 1964; Davis, Dempster, and Wildavsky 1966). Wildavsky's seminal 1964 study focused on budgeting within the national government and sought an understanding of how the budget was made and how Congress appropriated funds. Wildavsky viewed budgeting as a process that was concerned with the translation of financial resources into human purposes. He stated that "[s]ince funds are limited and have to be divided in one way or another, the budget becomes a mechanism for making choices among alternative expenditures" (2). Therefore, the budgetary process can be viewed as an expression of politics and characterized by a struggle for funding between departments, agencies, and appropriation committees. Agencies would make a request for funding, budget bureaus would recommend how much to appropriate, and finally the appropriation committee would decide how much to allocate. Wildavsky was concerned with the strategies that various actors might employ to get the funding they wanted and suggested that "[t]aken as a whole the federal budget is a representation in monetary terms of governmental activity. If politics is regarded in part as conflict over whose preferences shall prevail in the determination of national

policy, then the budget records the outcomes of this struggle” (4). As such, it can be seen that a primary function of budgeting is to make decisions about how resources will be allocated. Naomi Caiden suggests “[b]udgeting is more than technique. Budgets express societal decisions regarding the levels and sources of public revenue and mobilization and the purposes supported by public expenditure” (Caiden 48). Thus, a positivist study of budgeting is important because it can shed light on explaining and allowing for predictions of budgetary decisions and an understanding of how resources are allocated to diverse interests and claimants.

In order to gain an understanding of the budgetary process and attempts at generating a theory of budgeting, a review of several diverse sets of literatures will be conducted. The first strand of literature deals with tradeoffs between budgetary categories (defense and social welfare). The second set of literature relates to bounded rationality and the influence of cognitive limitations on establishing future budgets (incrementalism). Finally, literature regarding exogenous influences on the budgetary process will be explored.

Tradeoffs

Tradeoff relationships assume interdependence between categories so that a gain in one category results in a loss in another category. Examples of tradeoffs that have been posited include: equality and efficiency (e.g., Okun 1975), inflation and unemployment (e.g., Phillips 1958), timeliness and quality in court performance (e.g., Ostrom and Hanson 1999), and guns and butter (Russett 1969). Tradeoff relationships may also exist within the process of determining budgetary expenditures for broad

categories of expenditures (e.g., defense and domestic spending), departments, agencies within departments, or programs within agencies (Berry 1990, 191). A tradeoff between two categories of expenditure assumes that “the choice of an expenditure for one category must affect the amount of money allocated to the other category, such that spending in one comes at the expense of the other” (Berry and Lowery 1990, 671). Budgetary tradeoffs occur when the demand for resources for public programs exceeds a finite pool of public resources that are available for allocation.¹ One way to understand tradeoff relationships is to examine a budget line.

A budget line combines the ideas of resource availability and substitution between various categories of expenditure (usually two budgetary categories at a time).² The line itself represents the total budget that can be allocated among various activities, in this case government activities, with a downward slope implying that appropriating more funds to one area means less for other areas. The frontier is based on expected revenues and financial constraints. An examination of Figure 2.1 reveals that at point A (on the frontier) more money will be appropriated towards category I than category II. A point on the budget line represents the point where policymaker indifference curves are tangent to the budget line. This point represents the optimum or preferred policy, where the utility of the budgetary decision makers are maximized. Similarly, a move to point B and the appropriation of more money for category II mandates that category I will receive less funds. This framework is useful for the present study of budgeting by providing an

¹ Governments can avoid budgetary tradeoffs by providing a limitless supply of resources for public programs. Demands can be met by raising taxes and/or absorbing deficits (Pryor 1968). However, political realities place a cap on both of these sources, guaranteeing a finite pool of resources.

² This author recognizes that there may be more than two competing forces for limited resources in a society. Nevertheless, this framework provides a rudimentary way to understand the process of the competition over limited resources and the resultant gains at the expense of other areas.

overview that illustrates that a budget is a limiting resource that necessitates that the allocation of resources to one budgetary category comes at the expense of other categories in any fiscal year (e.g., spending on corrections that could be used for higher education, or vice versa).³ The most analyzed budgetary tradeoff in the political science literature is the relationship between guns and butter.

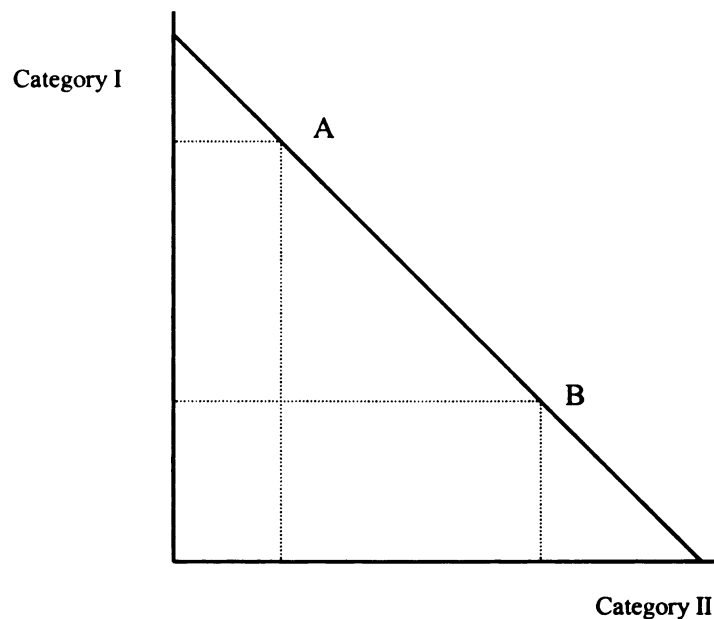


Figure 2.1: Budget Line and the Tradeoff Between Goods

Studies focusing on a tradeoff between guns and butter attempt to assess the existence of a tradeoff between defense and social welfare spending (e.g., education

³ An alternative way to conceptualize this would be to focus on the production possibility curve. This approach allows one to understand tradeoffs and opportunity costs (the goods and services that must be given up in order to acquire more of another good) within the light of efficient production.

and/or health). These studies have been cross-national (Russett 1969; Caputo 1975; Domke, Eichenberg, and Kelleher 1983; Looney and Frederiksen 1996) and domestic (Peroff and Podolak-Warren 1979; Russett 1982; Mintz 1989; Mintz and Huang 1991) in focus and have reached mixed conclusions in their ability to confirm the existence of a tradeoff between guns and butter.⁴

The mixed results have led many scholars to believe that defense and welfare expenditures are driven by separate sets of determinants (Caputo 1975; Domke, Eichenberg, and Kelleher 1983; Russett 1982). These authors argue against the idea of interdependence and feel that spending decisions are characterized less by a “systematic comparison of alternatives than a disjointed aggregation of spending decisions reached largely in isolation” (Domke, Eichenberg, and Kelleher, 20). Domke, Eichenberg, and Kelleher (1983) extend this line of reasoning by asserting that “students of budgetary decisionmaking have discovered that direct priority setting - the trading off of one program against the other - is rare or nonexistent in democratic governments” (20). To further explore this issue of interdependency it is necessary to examine the literature surrounding budgetary decisionmaking.

⁴ Berry and Lowery (1990) note that almost all empirical work on the tradeoff between guns and butter has relied on the same basic methodology, either a single-equation regression model or a multiequation causal model. These models measure the strength of the relationship between annual percentage change in one category and change in another, with a negative sign for the relationship indicative of a tradeoff relationship. Berry and Lowery comment that this approach limits conclusions to a descriptive level and is incapable of providing insight into the process whereby tradeoff choices are made (Berry and Lowery, 672-74). The authors suggest that tradeoff relationships can manifest themselves in many forms and each type requires a different model to illuminate tradeoff processes. In order to understand the determinants of the degree to which A is rewarded at B's expense they construct a taxonomy consisting of allocations from a fixed pool (sequential choice and simultaneous) and floating pool allocations (Berry and Lowery, 677).

Budgetary Decisionmaking

Early scholarly works dealing with budgetary decisionmaking processes were derived from theories of bounded rationality (Simon 1947) and incrementalism (Lindblom 1959). Lindblom viewed decisionmaking as a series of successive limited comparisons that served to reduce and simplify decisionmaking. Within this framework, policy comparisons are limited “to those policies that differ in relatively small degree from policies presently in effect” (Lindblom 1959, 84). This perspective was generated from a critique of the rational decision making approach. Lindblom asserted that the rational-comprehensive (root) model of decision making consisted of a series of ordered, logical steps where all possible alternatives are identified and the alternative with the highest payoff (alternative that attains greatest amount of desired values) is chosen. The assumption was made that complete information about all alternatives is both available and manageable. Critics of the rational comprehensive model claimed that cognitive limitations prevented a complete evaluation of all alternatives. For example, Simon (1947) states that “[t]he limits of rationality have been seen to derive from the inability of the human mind to bring to bear upon a single decision all the aspects of value, knowledge, and behavior that would be relevant” (108). In other words, all alternatives could not be known and even if they could, individuals and agencies could not compare them all. Thus, individuals and agencies are forced to use rules of thumb and to satisfice.

These foundational principles were incorporated into theories of budgeting by Wildavsky (1964) and Davis, Dempster, and Wildavsky (1966) who contend that budgets themselves are never reviewed as a whole. Actors in the budgeting process cannot consider the value of all preexisting programs compared to all possible alternatives.

Instead, incremental calculations proceed from existing bases, so that “this year’s budget is based on last year’s budget, with special attention given to a narrow range of increases or decreases” (Davis, Dempster, and Wildavsky 1966, 529-30).⁵ In this conceptualization, the base is considered as a given and is representative of past decisions or negotiated agreements between competing interests, whereby only the increment of change is evaluated in the present. This perspective implies that budgeting follows a ‘bottom-up’ process and that each program’s budget is independent of spending pressure for other expenditure categories (Davis, Dempster, and Wildavsky 1966; Gist 1982) and remains immune from political and economic considerations (Su, Kamlet, and Mowery 1993, 215).⁶ This ‘bottom-up’ conceptualization has received criticism for ignoring the possible impact of line item interdependency as well as the possibility that exogenous factors may influence the budget making process (e.g., macroeconomic factors, partisan control of legislatures, and public opinion).

Exogenous Factors

Kamlet and Mowery (1980) suggest that the incrementalist (‘bottom-up’) model of budgeting fails to account for the finite resource base that characterizes the resource allocation process (814). In addition to last year’s spending level, the level of spending for a budget category may be influenced by “fiscal pressures, the availability of tax

⁵ Allen Schick (1988) critiques incrementalism as being a normative theory that is a statement both about how budgeting works and how it should work. He states that incrementalism is valued because it “moderates conflict, reduces search and transaction costs, stabilizes budgetary roles and expectations, reduces the amount of time that busy officials must spend on budgeting, and facilitates remedial action to correct mistakes” (Schick 61).

⁶ The ‘bottom-up’ process involves strategic bargaining and negotiations between bureaus and higher levels in the budgetary hierarchy (e.g., departments and the Office of Management and Budget), in regards to changes in the increment (Bozeman and Straussman 1982). Bozeman and Straussman state that “the incrementalist approach assigns central importance to the role of negotiation strategies” (510).

revenues, or by spending pressures generated by other categories of spending” (Su, Kamlet, and Mowery 1993, 215, note 2). As such, they argue the notion of independence is dismissed, as there is interdependence between budgetary, tax, and fiscal priorities.⁷ These ‘top down’ models (Kamlet and Mowery 1980, 1983, 1987; Auten, Bozeman, and Cline 1984; Su, Kamlet, Mowery 1993) once again open the door for explicit tradeoffs to occur between budgetary categories, by suggesting that resource pools are indeed finite. Ultimately, budgetary outcomes are sensitive to pressures for growth in other programs and various exogenous fiscal and political variables.

Davis, Dempster, and Wildavsky (1974) suggest that an agency’s budget is primarily incremental in nature, but is occasionally responsive to specific political, general economic, or social events. For these authors, the inclusion of exogenous factors into their models represented an expansion of a previous specification that was comprised solely of factors internal to the budgetary process (1966). Similarly, Allen Schick suggests that “[b]udgeting is the process that prescribes how, when, and by whom claims are to be made and resources distributed” (Schick, 63). The core characteristics of this process are claiming forces (requests for resources made according to the rules and procedures of the process) versus conserving forces (activity intervening between claims and allocation that authoritatively rations resources). Schick states that in “a perfect budget process, rations reflect the balance between claims and conservation. Anything that alters the relative strength of these functions will change budget outcomes” (66). The strength of these functions is often influenced by exogenous factors. The multitude

⁷ Fiscal and tax policies, in conjunction with economic trends, establish a fixed pool of resources for each budgetary period that act as a constraint on total outlays (Kamlet and Mowery 1980). The ‘top-down’ process reflects both fiscal and political aspects that operate in accord with budgetary policy in establishing government expenditures.

of studies, following the work of Davis, Dempster, and Wildavsky, that focus on exogenous factors and their impact on budgetary priorities have focused on the role of factors such as: deficit levels, unemployment, inflation, increases in target populations, and partisan control of the executive and legislative branches. This conceptualization has been incorporated into studies focusing on criminal justice expenditures, spending for corrections and spending for higher education.

William Taggart (1989) and Harriman and Straussman (1983) both focus on the impact of court orders regarding overcrowding on state expenditures for corrections. Taggart (1989) attempts to develop a general model of state expenditures for corrections that accounts for judicial interventions as shift points that can alter the incremental nature of the budget. Similarly, Calderia and Cowart (1980) focus on the responsiveness of government institutions to policy relevant conditions (e.g., crime rates for criminal justice). Caldeira and Cowart (1980) theorize that “policymakers in criminal justice decide on appropriate levels of expenditure for their units by observing these policy-relevant conditions” (416). Likewise, Layzell and Lyddon (1990) suggest that political, economic, and demographic factors “serve as immediate indicators of supply and demand for state services” (80). Finally, Marlow and Shiers (1999), in a recent article attempt to understand if expenditures on law enforcement ‘crowd-out’ public education expenditures in state governments.⁸ They state that “[t]he total budget is then the sum of its component parts, where various demographic (e.g., age distribution), economic (e.g., unemployment rates), and cultural (e.g., past crime rates) characteristics then influence demand for individual spending programmes” (257). Thus, these policy relevant

⁸ It should be noted that these authors do not attempt to generate a theory of the budgetary process and only focus on data from two discrete time points (1985 and 1992).

conditions help establish a 'window of opportunity' for policy entrepreneurs (Kingdon, 1995). Policy entrepreneurs utilize these indicators and conditions to focus attention towards problems where solutions can be attached (Kingdon 1995; Mintrom 1997).⁹ However, these authors and others fail to consider the impact of specific policies on the budgetary process.

Specific policies have the ability to impact the budgetary process since they necessitate the commitment of resources to certain programs and governmental departments. Recent state policy changes relating to corrections and sentencing provide a fertile area to study the impact of policies on budgetary choices.

Policy Changes in Corrections

Beginning in the early 1900's and continuing through the 1970's the medical or rehabilitative model of corrections dominated state sentencing practices. This model operated under a framework whereby legislatures set broad sentencing parameters, judges imposed minimum and maximum prison terms within these parameters, and parole boards determined the time in prison (Griset 1994, 533). The rehabilitative ideal placed an emphasis upon the reformation of the offender and attempted to ensure that the punishment fit the criminal and not necessarily the crime (Davies 1985, 3). This approach focused on the individual and tried to achieve sentences that were just for each individual defendant (Ostrom et al. 1998, 8). Therefore, this practice was indeterminate in nature and allowed for case-by-case decisionmaking and tremendous discretion for

⁹ Policy entrepreneurs are individuals who seek dynamic policy change and are advocates for proposals or for the prominence of an idea (Mintrom 1997, 739; Kingdon 1995, 122).

both judges and parole boards.¹⁰ However, the rehabilitative system was characterized by its critics as being “replete with unbridled and unprincipled discretion, arbitrary and capricious, unfair, violative of the notions of proportionality” (Lagoy et al., 386).

In the mid 1970’s a coalition of interests arose in opposition to indeterminate sentencing. One part of the coalition was concerned with discretionary decisions being made about individual’s liberty and the excessive disparity among sentences in presumably similar cases. They were especially concerned with the possibility of discriminatory sentencing practices based upon the race of the offender. The other side of the coalition was more concerned with lenient parole boards that would often release prisoners well before maximum sentences were reached (Blumstein 1984, 130). The critics of indeterminate sentencing were responding to a series of factors including: prison uprisings in the 1960’s (e.g., Attica and Tombs riots in New York), a disillusionment with rehabilitation,¹¹ a concern about individual rights and the control of discretion, racial and class discrimination, and rising crime rates throughout the 1960’s (Blumstein et al. 1983, 2). In response, critics called for a new approach that would mete out fair and fixed punishments that would eliminate sentencing disparities and discretion, in other words, a move towards presumptive or determinate sentencing.¹²

Determinate sentencing schemes are presumptive in nature and establish standards or guidelines that dictate how much punishment convicted offenders should

¹⁰ Judges had a broad authority to set appropriate sentences, while parole boards had the authority to set release dates and release conditions for those sentenced to prison.

¹¹ A 1974 report by Robert Martinson that reviewed 200 prison programs found ‘little value’ in rehabilitation (Clark, 109).

¹² The argument has been made that limiting discretion in one area only leads to increases in discretion in other areas (hydraulic displacement of discretion). Thus, a reduction of discretion for judges, who have broad authority to set appropriate sentences, and for parole boards, who have the authority to set release dates and release conditions, is replaced by increased discretion of prosecutors who decide which offenders are to be prosecuted and with what charges (Ostrom et al. 1998, 9).

receive.¹³ Inclusive within this schema are the creation of sentencing schedules (e.g., California Determinate Sentencing Law), sentencing guidelines that create ranges of sentences for given offenses and offender characteristics (e.g., Minnesota), and the abolition of parole boards (e.g., Virginia).¹⁴ At the same time as the shift to determinacy, several states imposed mandatory minimum penalties for offenders who committed very serious crimes, for offenders who could be classified as repeat or habitual offenders, and for offenses ranging from sexual assault to drug crimes to the use of a gun (Shane-Dubow, Brown, and Olsen, v). According to a 1996 study conducted by the National Council on Crime and Delinquency, all 50 states have some form of mandatory minimum sentences or habitual offender statutes (Austin, 161). Mandatory minimums force judges to hand out fixed sentences without parole, to people convicted of certain crimes.¹⁵ For example, in 1978 Michigan lawmakers passed the “650 Lifer law” which mandated life imprisonment without parole for possession, sales, or conspiracy to sell, deliver, or possess 650 grams or more of cocaine or heroin. An additional example is the 1973 Rockefeller Drug laws established in New York, which mandated minimum penalties for various drug offenses. A report by the National Institute of Justice suggests that mandatory minimums serve to deter future criminal behavior through the threat of imprisonment and act to enhance public safety via incapacitation (Ku 1980, 2). These

¹³ Determinate sentencing schemes have wide variation among ‘operational forms’ among the various states (Nagin 1979; von Hirsch and Hanrahan 1981; Griset 1994).

¹⁴ Between 1975 and January 1982 eleven states (Alaska, Arizona, California, Colorado, Connecticut, Illinois, Indiana, Maine, Minnesota, New Mexico, and North Carolina) abolished parole boards (Blumstein 1984, 130).

¹⁵ One unintended consequence of these reforms are that mandatory minimums provide defendants with a strong incentive to go to trial in order to avoid lengthy sentences and this translates into increases in the number of court cases and thus higher court costs. For example, prior to the introduction of a three strikes law in California, ninety percent of all felony cases in California were plea-bargained. Following the introduction of the law in 1994, up through 1995, only 14 percent of second felony and 6 percent of third felony cases obtained guilty pleas (Edwards, 468).

new policies and philosophical shifts represented a radical departure from previous sentencing practices.

On May 1, 1976 Maine became the first state to abandon indeterminate sentencing and the parole system. They were soon joined by several states including California who adopted the Determinate Sentencing Law in 1977.¹⁶ The law established a presumptive sentencing scheme that limited prison terms to a very narrow range of possibilities. Additionally, the law eliminated parole discretion by abolishing the release decision power of the Adult Authority (California parole board). The new law in California represented a radical shift away from the open-ended sentences of the rehabilitation era and a move towards a 'justice' system of sentencing (Davies 1985, 2). The new philosophical approach is expressed in Section 1170a of the California Penal Code, which states "the purpose of imprisonment for crime is punishment" (Davies 1985, 2). The justice approach views offenses as the responsibility of the offender and punishment as a 'just dessert' (von Hirsch 1976). Hence, rehabilitation is replaced by a retributive philosophy that views punishment as an end in itself (Davies 1984, 4). Don Gottfredson, commenting on the move towards determinate sentencing, states that "sentencing purposes have shifted from an emphasis on utilitarian aims, particularly treatment, toward a greater focus on deserved punishment, on the proportionality of sanctions to harms done, and on equality" (Gottfredson 1984).

Another policy aimed at reducing judicial discretion, by mandating severe prison sentences for second and third time offenders, is Three Strikes and You're Out laws. Beginning in 1993, 23 states and the federal government adopted some form of three strikes legislation targeting repeat violent offenders. California which adopted a three

strikes law in 1994, doubles the prison sentence for second strike offenders with a prior serious or 'violent' felony conviction. Offenders convicted of any felony after two previous serious or 'violent' felony convictions are sentenced to prison for a length of twenty-five years to life.

Additionally, several states have enacted Truth in Sentencing laws, which require offenders to serve a substantial portion of their sentences and thus reduce the discrepancy between the imposed sentence and time served in prison. A 1995 report by the U.S. Department of Justice points out the large discrepancy that existed before truth in sentencing reforms. The report stated that criminals convicted of violent crime serve on average only 48% of their court-imposed sentences before being released early from prison (Crimestrike, 1). The act of bringing the time an offender actually serves in custody closer in line with the length of the sentence imposed by the court can help restore public confidence in the criminal justice system, help further deterrence, victim's rights, predictability, fairness, and consistency in the sentencing process (Ostrom et al. 1999, 14). By the end of 1998, 27 states and the District of Columbia required violent offenders to serve at least 85 percent of their prison sentences, compared with only 5 states in 1993 (Ditton and Wilson 1999).¹⁷ The creation of Truth in Sentencing laws was spurred on by the federal Violent Crime Control and Law Enforcement Act of 1994. Contained within this act was the Violent Offender Incarceration/Truth-in-Sentencing (VOI/TIS) incentive grants program that offered \$9.7 billion for states that required offenders convicted of Part I violent crimes to serve not less than 85 percent of their

¹⁶ California introduced indeterminate sentencing in 1917.

¹⁷ Truth in Sentencing laws vary across the states with some states requiring 100 percent of sentences to be served (e.g., Idaho and Nevada), some 85 percent (e.g., California, Michigan, New York, and Virginia), and others only 50 percent (e.g., Indiana and Texas).

sentence.¹⁸ States that complied were eligible to receive grants that could be used to build and operate new or existing prison facilities (Ditton and Wilson 1999). The state of Michigan alone received over \$55 million between 1994 and 1998 under this program (Michigan Department of Corrections, 36a). Truth in sentencing initiatives operate in such a way that policies that acted to reduce the amount of time an offender served, such as good time, earned-time and parole-board release, are restricted or eliminated (Ditton and Wilson 1999, 3). Steven Donziger suggests that this federal incentive scheme represents evidence of a national ‘get tough’ on crime trend that began in the late 1960’s. He states that the federal government influences “crime policy by withholding money from the state unless they adopted certain ‘get tough’ policies favored by the federal government” (Donziger 1996, 13).¹⁹

The various policies that have been enacted by state governments influence sentencing lengths from both the ‘front end’ and from the ‘back end.’ Determinate sentencing, mandatory minimums, sentencing guidelines, and truth in sentencing all function to establish a predetermined length of commitment for offenders at the time of sentencing. While the elimination of parole boards and the abolition of other mechanisms of prison reduction act to eliminate mechanisms for early release from prison following sentencing and imprisonment. Another way to examine the impact of various public policies impacting corrections is to focus on their place within the stages of the criminal justice process that impact growth in incarceration.

¹⁸ Part I violent crimes include murder, nonnegligent manslaughter, rape, robbery, and aggravated assault.

¹⁹ Donziger notes that since 1968, six major anti-crime bills have been passed by Congress and signed by the President (Donziger 1996)

Stages of the Criminal Justice System

The stages of the criminal justice system that impact the growth of incarceration include the commission of a crime, the arrest of an offender, the conviction of the offender, the commitment of an offender, and time served in prison by the offender (Blumstein and Beck 1999). Blumstein and Beck (1999) suggest that as “a result of the ‘get tough’ rhetoric that has characterized much political discussion about criminal justice policy over the past two decades, both significant growth in the likelihood of commitment to prison for those arrested and in time served by those sent to prison might be expected” (27). As can be seen in Figure 2.2, the various policies that have been discussed earlier have an impact on the level of commitment to prison and on the length of time served by offenders.²⁰

²⁰ Parole has been added as a stage because it serves as a procedure that can impact time served, by reducing the sentence of an offender. Additionally, the elimination of this release mechanism by many states represents the removal of a safety valve for prison overcrowding. Previously, when states did not meet statutes regarding prison occupancy levels, the threshold of the degree of rehabilitation warranting release could be lowered. Finally, acts of technical parole violations lead to many parolees being returned to prison. For example, out of 9,424 convicted offenders committed to prison as new court commitments, probation violators, parole violators, and escapees with new sentences in Michigan in 1998, 3,109 represented technical parole violators (*Factors That Drive Prison Population Growth*, State of Michigan). This process has been facilitated by the advent of Re-entry Courts in several states.

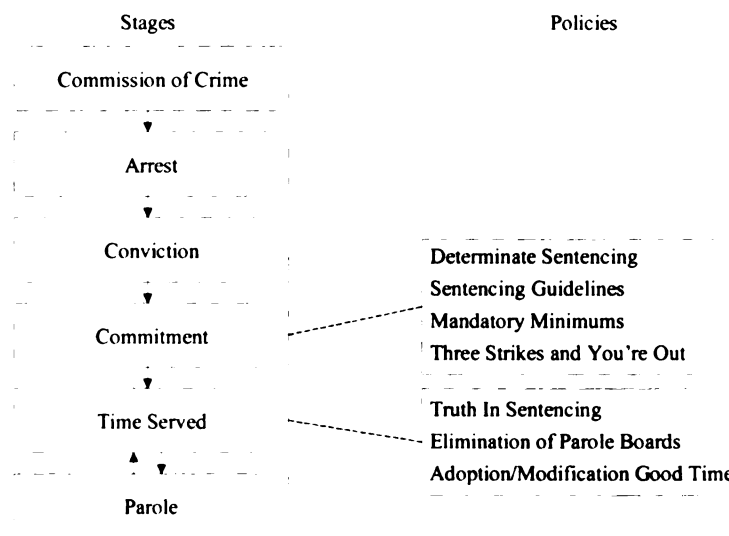


Figure 2.2: Stages of the Criminal Justice Process and Policies that Impact State Incarceration Rates

In a previous study, Cohen and Canela-Cacho (1994) examined the growth in incarceration rate from 1977 to 1988 in six states by focusing on the impact of the five stages of the criminal justice process.²¹ While variation existed between the states, the authors found that the growth in all the states' incarceration rates was a result of commitments to prison and time served (Blumstein and Beck 1999, 26, ft. note 5). Similarly, Blumstein and Beck (1999) suggest that the "growing incarceration rate is a compounded effect of changes at each of the stages of the criminal justice system" (42).²²

²¹ Two of the six states the authors focused on are included in this study (California and Michigan), while the other four states were Florida, New York, Pennsylvania, and Texas.

²² Blumstein and Beck (1999) note that there is variation among crime types in regards to the affect of various stages. For example, the growth in incarceration rate for drug crimes is attributable to a rapid growth in the number of arrests and commitments to arrest, not to time served. Conversely, growth in incarceration rates for murder is entirely accountable by the growth in time served (42).

The authors focus on six offenses (murder, sexual assault, robbery, assault, burglary, and drugs) between 1980 and 1996 and provide an indication of the contribution of each stage to the total growth in the incarceration rate. They find that the offense rate accounts for 11.5 percent, arrests per offense .5 percent, commitments per arrest 51.4 percent, and time served 36.6 percent. These findings indicate that only 12 percent of the growth in incarceration is attributable to increased offending, while the remaining 88 percent is attributable to increases in the imposition of sanctions. Finally, the authors examine the growth in incarceration rate while omitting drug offenses. Blumstein and Beck find that there is a negative trend for the offense rate, arrests per offense account for .8 percent, commitments per arrest 41.5 percent, and time served 57.7 percent. Thus, over 99 percent of the growth in incarceration is associated with sanctions (43).²³ On a similar note, Austin (1996) points out that while new court commitments may have grown slightly, stayed the same, or even declined, prison populations have continued to grow at a faster rate. For example, in Michigan the number of new court commitments to prison declined 18.4% from 9,333 in 1990 to 7,614 in 1994, while the prisoner population increased 17.4% from 34,267 to 40,220. Similarly, new court commitments in Virginia grew by 11.7%, while the prisoner population grew 45% between 1990 and 1994 (Austin, 1996). These findings are important because they suggest that policy changes may have directly impacted the sanctioning phase of the criminal justice process and resulted in increased incarceration rates and helped bring about the ‘crisis in corrections.’

As discussed earlier in this dissertation, the ‘crisis in corrections’ derived from serious prison overcrowding that resulted in the necessity to build several new state

²³ An additional study by Langan (1991), which focused on increasing prison populations between 1974 and 1986, found that increases were not a function of increased sentence lengths, but rather a function of

prisons and increase the number of employees working within the Department of Corrections. For example, in California alone 21 new prisons were built and 25,864 new employees were added to the Department of Corrections between 1984 and 1997 (Ambrosio and Schiraldi 1997). In budgetary terms, this would suggest that states would have to increase appropriations for capital budgets (construction) and operations for corrections. Thus, policies that have impacted prison incapacitation may have a direct impact on budgetary appropriations. An illustration utilizing a supply and demand framework can be used to further demonstrate the impact of ‘tough on crime’ policies on budgetary appropriations.

In figure 2.3, point A represents the status quo equilibrium. A shift from the status quo occurs as states adopt ‘tough on crime’ policies that both increase commitments per arrest and the time served by offenders. Thus, the demand for prison beds increases (represented by a shift in the demand curve) and a new equilibrium is established at point B. In the short run, the existing supply of prison beds would remain constant and the increase in incarceration would be met by double bunking inmates. Without a simultaneous increase in the supply of prison beds, prisons begin to become overcrowded. As a result, the price per prisoner increases as more prison guards are hired, operation staffs are increased, and the possibility of increased costs associated with overcrowding (lawsuits and inmate deaths) becomes a reality. In response to these increased costs, the legislature appropriates more money to corrections for both capital outlays (to build more prisons) and for operations (for increasing Department of Corrections employees). Graphically this is illustrated in the shift to point C as the

more prison sentences per arrest.

number of beds increase to meet the increase in supply of inmates and the per inmate cost associated with ‘get tough’ policies seems to fall.²⁴

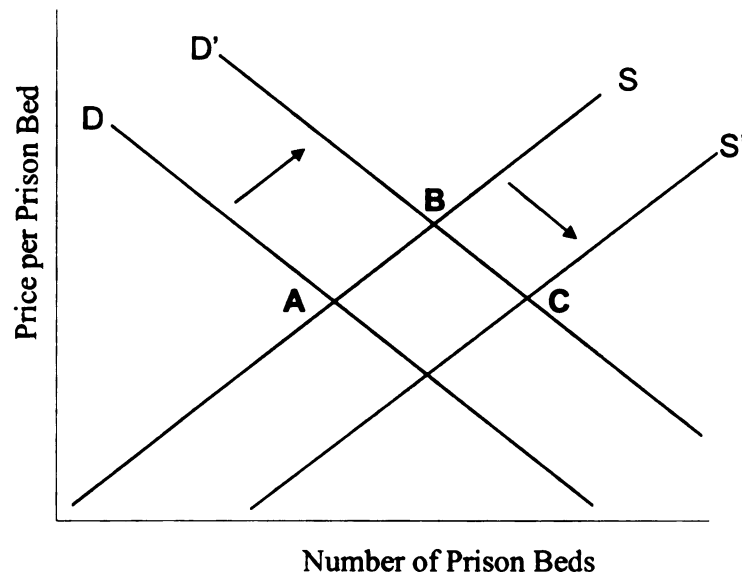


Figure 2.3: Supply and Demand for Prison Beds

A similar framework can be adopted to understand the potential tradeoff that might exist between appropriations for corrections and appropriations for higher education. Figure 2.4 shows the supply and demand curves for higher education. Similar to corrections (prisons), the demand curve shifts outward to the right to point B as demand for higher education increases. Demand is increasing as college degrees have become more of a prerequisite for employment and as the benefits associated with

²⁴ It is beyond the scope of this illustration to make conjectures about the elasticity of both the supply and demand curves and to offer up a prediction about where equilibrium C resides in relation to equilibrium A when considering price. The graphical aid and discussion above is intended to provide elementary insights

attaining a college degree have risen (e.g., salary).²⁵ To meet this demand, universities are forced to hire new faculty members, build new classrooms, and increase staffs, all at a cost. In the short run, increased financial pressures are met by raising the price per student (tuition). However, faced with pressure from various interest groups the legislature responds by increasing appropriations for higher education (shift to point C) and thus increasing the supply of desks and decreasing the cost per desk (student). However, the question still remains: given the fact that state budgets are limited by scarce resources and an increasing demand for both corrections and higher education exists, how are the demands for these two differing state priorities met?

As the overall population continues to increase, more ‘tough on crime’ policies are implemented, and the incentives for the continuance of post-secondary education rise, demand for correction and higher education resources will continue to grow. It is possible that an expanding budgetary pie will be able to accommodate resource requests. However, the question becomes whether or not appropriations for corrections are rising at a rate sufficient to keep the cost per prisoner relatively constant compared to whether the amount appropriated for higher education is rising at a rate sufficient to keep the cost per student relatively constant. If scarce government resources are being appropriated for corrections in large enough sums that they crowd out resources available for higher education, then the price of attending college will rise to offset the increasing supply.²⁶

into the impact of policy changes upon the appropriation of monies for corrections and the expansion of correctional activities.

²⁵ Between 1970 and 1998 the number of students age 14 to 34 years old enrolled in four-year colleges increased from approximately 4,910,000 students to 8,794,000 (U.S. Census Bureau 1999).

²⁶ The ideas discussed in this section have evolved out of discussions this author had with Dr. Brian Ostrom.

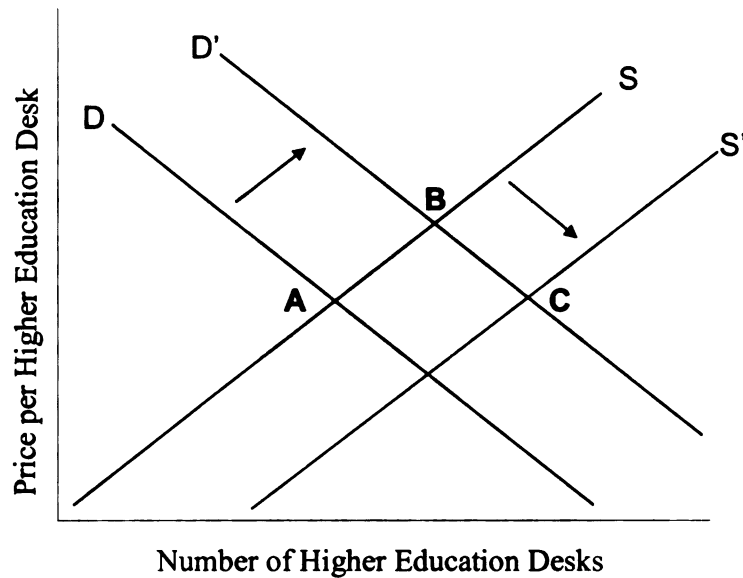


Figure 2.4: Supply and Demand for Higher Education

Overview of Study

This study will not attempt to determine the impact of policy reforms on prison populations, the impact of increased imprisonment on crime rates, nor will it be an evaluation of the effectiveness of particular policy changes on increasing sentencing lengths or the number sentenced. Instead, this study will focus on the impact of specific policies associated with corrections, at the state level, and model and evaluate the budgetary implications of these policy choices. It is hypothesized that these policies will have a direct impact on both appropriations for corrections and appropriations for higher education. The implications that follow from this framework are that legislative policy choices serve as an added exogenous factor that has an impact on budgetary choices. Additionally, it is assumed that budgetary choices made at the state level, that are based

upon a pool of resources that expands (or contracts) in each budgetary period (Berry and Lowery 1990), may be influenced by both 'bottom-up' and 'top-down' processes. Thus, it will be critical to examine not only the explicit budgetary process, but also legislative activities (creation and implementation of specific policies) that produce budgetary outcomes. For a visual illustration of the budgetary process, see Figure 2.5.

Using Figure 2.5 as a design template, this study will focus on the following questions:

1. Does independence or interdependence between categories of spending characterize the budgetary process? In particular, is there a tradeoff between appropriations on corrections and appropriations on higher education at the state level?
2. To what extent is this year's budget a function of the previous year's budgetary base?
3. What is the role of exogenous factors in the final budgetary allocations to various categories of expenditure?
4. How can traditional incremental models be adjusted to accommodate for an expanding or declining budgetary pie?
5. To what extent do specific policies that are formulated outside of the budgetary realm have an impact on budgetary allocations?

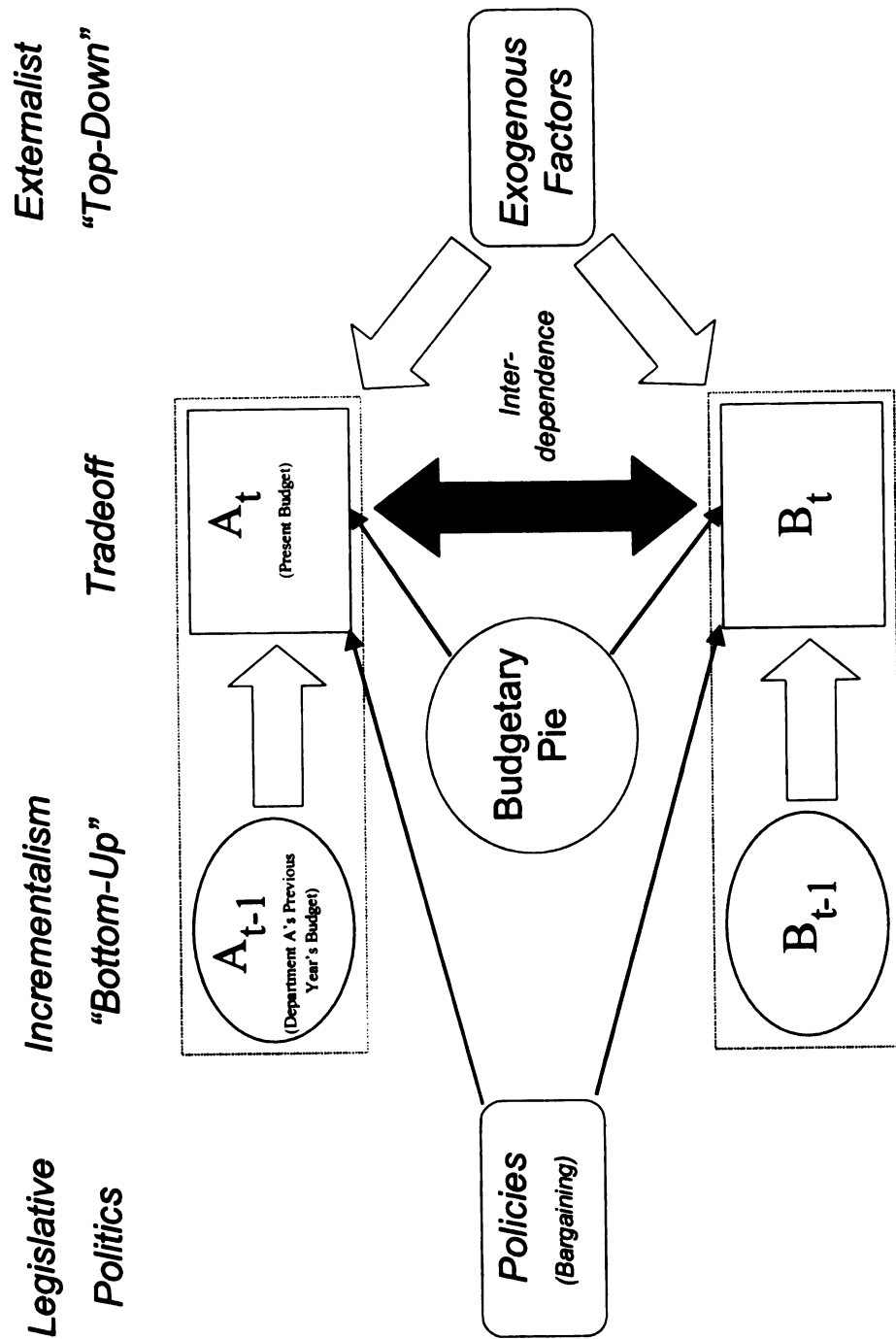


Figure 2.5: The Budgetary Process

CHAPTER 3

In order to address the questions posed at the end of Chapter 2 a series of theoretical hypotheses are generated that provide logical explanations for the linkage between concepts under investigation. Subsequently, a model is constructed that allows for an assessment of interdependence between budgetary categories. The model is comprised of various components and parameters to account for the influence of both incremental and 'top-down' processes, a possibly expanding budget, and exogenous factors, including specific public policies. After the empirical model has been specified, statistical hypotheses are generated that allow for empirical testing of the designated relationships that characterize the budgetary process. From there a research design is explicated that serves as an overview of how the study proceeds. Included is a discussion of the operationalization of concepts, sources of data, an overview of estimation strategies, and anticipated conclusions from the empirical analysis.

Theoretical Hypotheses

As outlined in chapter 2, this dissertation focuses on the construction of a budgetary theory and the determinant of commitments of state budgetary resources for different budgetary categories. More specifically, focus is placed upon the amount of monies appropriated for corrections and higher education. Building upon prior empirical research and theoretical frameworks this study explores if there is a tradeoff relationship between appropriations for corrections and appropriations for higher education; if budgetary appropriations can be characterized by an incremental process; if exogenous

factors exert significant influence on determining budgetary allocations; how a changing budgetary pie impacts appropriations; and the role that the implementation of specific public policies may play in determining budgetary allocations. In order to investigate these questions a series of theoretical hypothesis are generated that provide a theoretical linkage between the cause and effect relations between various concepts.

Budgetary Tradeoffs. Budgetary categories can be either independent of one another or be interdependent. In examining corrections and higher education, bottom-up processes may be the sole determinant of departmental allocations or there may be a tradeoff relationship between categories. It will be assumed that a finite pool of resources limits resources available to state governments. Therefore, budgetary gains in one category must come at the expense of other categories. Consequently, the budgetary process is characterized by interdependence between expenditure categories. The focus is placed on the potential tradeoff between corrections and higher education because these two budgetary categories are discretionary in nature, unlike entitlement programs such as Medicaid, and other budgetary areas that necessitate by law that a proportion of the state budget go to fund them (e.g., K-12).¹ Thus, changes in the amount for corrections cannot be offset by changes in these other programs that are fixed in nature and must be met either with an increase in taxation, additional revenue generation, or the reduction of budgets in other areas that are discretionary in nature.²

¹ For example, California's Proposition 98 (1988) guarantees a minimum amount of state funding for K-14 education and Michigan's Headlee Amendment (1978) assures that at least 41% of the state budget goes to local governmental units.

² Carroll and Bryton (1996) note that "the legislature is not required by statute or federal mandate to provide higher education or other services. Under current law, they must do with whatever revenues are left over after meeting the spending requirements of programs mandated by either federal law or propositions enacted into the California constitution."

TRADEOFF HYPOTHESIS: As total appropriations for corrections increases, total appropriations will decline for higher education and vice versa.

Incrementalism. The assumption is made that budgetary actors are constrained by limited cognitive abilities and thus, prior budgetary choices (t-1) will have a significant impact on present outcomes (t). In other words, budgetary actors are unable to review the entire budget each year and cannot consider all possible alternatives, thus budgetary actors are forced to make successive limited comparisons that reduce and simplify the decisionmaking process (Lindblom 1959). This implies that budgetary actors make budgetary decisions based upon the existing budgetary base. This relationship is captured in the following hypothesis.

INCREMENTALISM HYPOTHESIS: This year's budget will be influenced by the previous year's budget.

While past studies have found evidence that have reinforced the assertion that the budgetary process is characterized by incrementalism and decisionmaking by bounded rationality (Davis, Dempster, and Wildavsky 1966, 1974; Bozeman 1977; Kamlet and Mowery 1985; Kamlet, Mowery and Su 1988), more current studies have argued against the utility of this notion on both methodological and theoretical grounds.

In a recent article, Achen (2000) discusses some of the potential consequences associated with the inclusion of lagged dependent variables in time series applications. He suggests that when a lagged dependent variable is included into a regression equation with serial correlation the lagged variable effectively soaks up the effects of not only unmeasured variables, but also the included variables in the model. This results in the

incremental component often being highly significant and as a result any conclusions drawn about budgetary decisionmaking are often a direct result of a statistical artifact. As such, Achen argues that inclusion of incremental components often lead to large R^2 values and incredibly large t-ratios exaggerating the impact of incrementalism and minimizing the impact of political effects. This finding has major implications for studies of budgeting. Achen notes that “last year’s budget will predict this year’s budget very well even if it has little or no real causal impact” (9). In addition, Achen notes that the intellectual basis for incrementalism has recently come under “serious attack.” He suggests that advances in games of incomplete information have rendered the incrementalist perspective as “too limited to explain even the substantial variation in budget success” (8). He states that “[g]ames of incomplete information show that fully rational players will misleadingly appear to be merely boundedly rational in the usual case when the political environment is stable, but not at other times” (10). The author goes on to note that budgets are indeed quite stable over time and well predicted by the prior year, but this does not necessitate that decisionmakers are bounded rationalists or incrementalists. Thus, Achen’s argument provides both a methodological and theoretical rationale for excluding an incremental component from models of budgeting. From a theoretical perspective the idea of bounded rationality in budgeting has been debunked by games of incomplete information and empirically incrementalism has been shown to be difficult to disentangle. On the basis of these two critiques the incremental component of budgeting is not included in this study and the incrementalism hypothesis, laid out above, will not be tested.

Exogenous Factors. Beyond an explicit interdependence between categories, budgets are also responsive to exogenous factors. The budgets for corrections and higher education may be influenced by factors such as: the political ideology of the governor, the violent crime rate, changes in the size of the 18-24 year old cohort, the number of individuals enrolled in institutes of higher learning, and the unemployment rate. These factors combine to establish policy relevant conditions that create windows of opportunity and hence may influence the budgetary process. For example, the presence of a conservative governor may lead to an increase in the percentage of total appropriations committed for corrections and decreased levels appropriated for higher education. Charles Thomas, director of the Private Corrections Project at the University of Florida, states that “[c]onservatives put imprisonment higher on their political agenda than do their more liberal counterparts” (Mergenhausen 1996). Therefore, conservative state governors might pursue ‘tough on crime’ agendas that lead to the increase in the allocation of resources for criminal justice activities, including increases in appropriations for spending on corrections. Similarly, high violent crime rates might lead policymakers to respond to what they deem to be an active threat to society by increasing spending on corrections. Corrections increases might occur to meet the resource demand that occurs as more individuals are incarcerated³ or as policymakers anticipate a need for increased funding to meet future growth in prison populations.

In addition, a rise in the 18-24 year old cohort, the age group most prone to criminal activity, might signal that crime rates might rise and that increased spending for corrections is needed. The idea is that as more individuals engage in criminal activities, more individuals will enter into the stages of the criminal justice process and eventually

³ This assumes that higher crime rates are associated with higher arrest, conviction, and commitment rates.

end up increasing the number of individuals incarcerated, thus, increasing the need for additional resources for corrections. Furthermore, this cohort represents the age that most individuals pursue some form of postsecondary education. Thus, an increase in the size of this cohort may lead to more resources being designated for higher education to meet a growing demand. Additionally, increases in the number of students enrolled in institutions of higher education might lead to increases in appropriations for higher education. These appropriations might be needed to meet growing demands for additional operational resources and infrastructure renovations and expansions as growing student populations put a strain on existing higher education staffs and facilities. Finally, the fiscal well being of a state's economy may influence the amount of monies appropriated for corrections and higher education. During state fiscal crises, budgets for discretionary budget categories may be reduced to help balance state budgets and make additional revenues available. State unemployment rates are utilized in this study as a proxy for fiscal well being, so that as unemployment rates increase, appropriations for higher education decline. On the other hand, rising unemployment rates lead to increased appropriations for corrections. Huang et al. state that "higher unemployment rates lead directly or indirectly through their positive influence on crime rates, to higher imprisonment rates" (402) and thus higher appropriations for corrections.

EXOGENOUS HYPOTHESIS: Exogenous factors help in the creation of windows of opportunity and thereby influence appropriations in an episodic fashion.

Budgetary Pie. Budgets themselves do not remain constant over time. Expanding economies help foster growth in budgets and recessions serve to retard this development.

Overall budgetary expansion may be responsible for the growth of categorical budgets and mask tradeoff relationships. An expanding budget allows for the possibility that negative tradeoffs will not always occur in real terms. Rather than being a zero-sum game where an increase in one category necessitates a decrease in another category, it can be viewed as an expanding-sum game (See Figure 3.1).

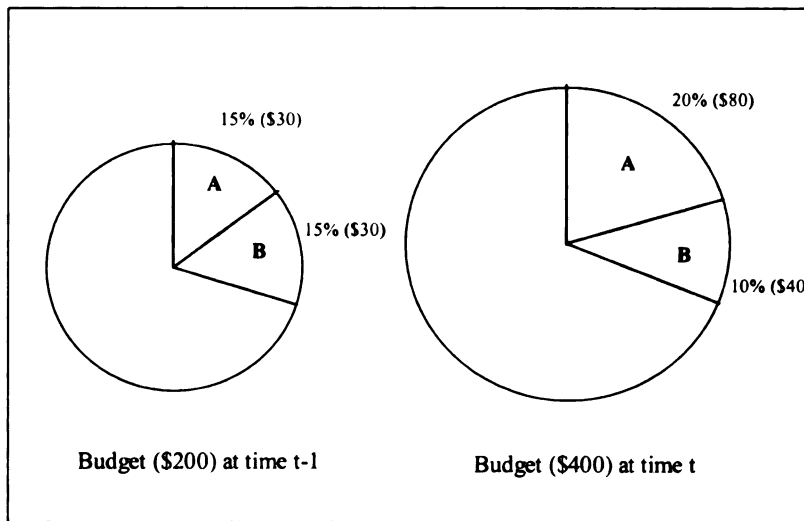


Figure 3.1: Budgets as an expanding-sum game.

For example, if the budget was \$200 at time t-1, and both categories A and B received fifteen percent of the budget, both categories would receive \$30. At time t the budget might expand to \$400 and category A might receive twenty percent (\$80) of the budget and category B might receive ten percent (\$40) of the budget. Thus, even though both categories increased their budgets in real terms, category B experienced a decline in the percentage of the budgetary pie it was allocated (Hayes 1975, 28). In regards to the present study, it is possible that both appropriations for corrections and appropriations for

higher education are increasing, but the percentage of the budgetary pie they are receiving from year to year is declining.

BUDGETARY PIE HYPOTHESIS: An increase (decrease) in the budgetary pie leads to increases (decreases) in both appropriations for corrections and higher education.

Public Policies. Finally, it is possible that discrete political events, in the form of public policies, have a direct impact on budgetary outcomes. These policies will impact the budgetary process by committing funds to specific programs and departments. For example, state government policies surrounding truth in sentencing, the adoption of determinate sentencing, mandatory minimums for weapon and drug crimes, and Three Strikes and You're Out will indirectly influence the resources that are needed to maintain the activities of correctional departments. For example, Blumstein and Beck (1999) note that the growth in state incarceration rates is due to the sanctioning phases of the criminal justice stages, which can be related to specific criminal justice policies. An increasing incarceration rate necessitates an increase in the resources required for both the operation and maintenance of correctional facilities, including the need to build new facilities. The resources that are committed to corrections as a result of legislative politics will come at the expense of higher education.

POLICY HYPOTHESIS: The implementation of specific correctional policies (e.g., truth in sentencing, Three Strikes and You're Out) lead to increases in the percentage of total appropriations for corrections.

Model and Statistical Hypotheses

Now that a series of theoretical hypotheses have been established, a model is constructed that allows for the testing of statistical hypotheses that are generated from the various theoretical hypotheses. The model of the budgetary process for corrections and higher education can be expressed as the following system of equations:

$$C_t = b_{10} + b_{11}E_t + b_{12}(P_t - P_{t-1}) + \sum_{k=1}^K \alpha_k X_{kt} + \sum_{p=1}^P \gamma_p Z_{pt} + e_{1t}$$
$$E_t = b_{20} + b_{21}C_t + b_{22}(P_t - P_{t-1}) + \sum_{k=1}^K \alpha_k X_{kt} + e_{2t}$$

where C_t and E_t represent appropriations for corrections and higher education, respectively, $(P_t - P_{t-1})$ is the change in the size of the overall budget from the previous year, X_k represents exogenous factors, and Z_p represents specific public policies.⁴

Each of the components and hypotheses discussed above can be assessed utilizing the specified model. First, the existence of a tradeoff relationship can be determined by examining the coefficients b_{11} and b_{21} . The traditional way to think about a tradeoff occurring would be to think of one of the coefficients being positive and the other negative. The other way would be for one coefficient to be greater than one and the other less than one. This would express the rate at which one of the budgetary categories is growing in relation to the other category. Second, the impact of exogenous factors can be determined by examining the magnitude of α_k ($k=1, 2, \dots, K$). If the coefficients are zero, then independence can be deduced. Similarly, the impact of specific public policies can be determined by assessing the magnitude of γ_p ($p=1, 2, \dots, P$). Finally, it is possible

that changes in budgetary appropriations may be a function of an expanding or decreasing budget. As a result, the impact of a changing budgetary pie can be examined by evaluating the magnitude of b_{12} and b_{22} .

Table 3.1: Statistical Hypotheses

Tradeoffs	$b_{11} > 0$ while $b_{21} < 0$, or $b_{11} > 1.0$ while $b_{21} < 1.0$ (vice versa)
Independence	$\alpha_k = 0$
Interdependence	$\alpha_k \neq 0$
Budgetary Pie	$b_{12} > 0$, $b_{22} > 0$
Policy Impact	$\gamma_p > 0$

Data Source

In order to test the statistical hypotheses, data was collected from three states: California, Michigan, and Virginia, for the years 1970 to 1999. These states are representative of the geographic regions of the United States (West, Midwest, South) and possess over 19 percent of all prisoners held under the jurisdiction of state correctional authorities in 1996 (Gilliard and Beck 1998, 3). At year's end in 1996 California held 142,865 state prisoners, Michigan held 42,349, and Virginia 27,062 out of a total of 1,131,581 state prisoners (Gilliard and Beck 1998, 3). In a 1994 ranking of states with the largest prison populations, all three states ranked in the top ten states with the most prisoners, with California ranking first. Additionally, the states all experienced problems with overcrowding. In 1992, California had the most over crowded prisons in the nation

at 91 percent over capacity. Michigan and Virginia both were in the top ten and were 44 percent and 39 percent over capacity, respectively. Therefore, these three states are all states where the issue of prisons and corrections is very salient.

As discussed earlier in this dissertation, there has been a national trend since the early 1970's towards the implementation of policies that are both 'tough on crime' and determinate in nature. These reforms have occurred during the period of study and allow for an interrupted time series framework to be undertaken. The range of these policies have come under the headings of mandatory minimums, truth in sentencing, sentencing guidelines, and alterations to the parole system. The three states in this study comprise a sample that have all experienced a series of reforms that, taken together, include all of the typologies listed above. For example, mandatory minimums have been implemented in Michigan, truth in sentencing in Virginia, sentencing guidelines in Michigan, and modifications to parole mechanisms have occurred in California and Michigan.⁵ Each of these states has experienced radical policy reforms that are representative of a national change in philosophical approaches towards sentencing and a fundamental restructuring of the way that judicial sentencing is performed. These reforms have impacted three decision points in the sentencing process: the decision to incarcerate, the selection of sentence length, and the decision to release. As such, all three states have experienced a large increase in their prison populations and overcrowding in their prisons as the number of inmates outgrew prison capacities.

⁵ This list is far from exhaustive.

Operationalization and Data Sources

The next step in the research process is to operationalize theoretical concepts into variables that can be represented by numerical referents. Table 3.2 displays the way that the various theoretical concepts are measured. In conjunction with this table a discussion of the operationalization of concepts is warranted. This discussion provides an overview of the desired data characteristics, the data measure selected, and the data sources.

Table 3.2: Operationalization

<i>Symbol</i>	<i>Concept</i>	<i>Operationalization</i>
C_t	Appropriations for Corrections	• Appropriations for corrections from state appropriations for fiscal year t
E_t	Appropriations for Higher Education	• Appropriations for higher education from state appropriations for fiscal year t
$(P_t - P_{t-1})$	Budgetary Pie	• Total state appropriations for fiscal year t minus state appropriations for fiscal year t – 1
X_k	Exogenous Factors	• Violent Crime rate -- Federal Bureau of Investigation's Uniform Crime Rate for Index Crimes • Enrollment in institutions of higher education – Statistical Abstract of the United States • 18-24 year old cohort -- U.S. Census Bureau population statistics • Governor's political party (0 = Democrat; 1 = Republican) • State Unemployment rate – U.S. Census Bureau, Current Population Survey
Z_p	Public Policies	• Specific public policies (e.g., Three Strikes and You're Out) related to corrections (0 = no policy; 1 = following passage of policy)

Appropriations:

Appropriations were selected as the unit of measurement for budgeting because it best represents the culmination of the legislative budgetary decision process. This process includes the submission of requests for appropriations from governmental departments and agencies, the establishment of the governor's executive budget, negotiations and resultant changes to budgetary proposals by state legislative fiscal committees, and final approval of appropriations by state legislative bodies. Thus, appropriations represent an endpoint of a lengthy process whereby funds are made available to departments and agencies for expenditure. Inclusive within the budgetary process are decisions about how large the state budget should be and potential allocation tradeoffs between departments and agencies. In contrast, expenditures are less desirable for examining the budgetary process because they represent a different set of decisionmaking processes. Expenditures represent the actual spending decisions of various departments and agencies that follow decisions about the amount of monies to be appropriated. The amount of money expended is often more or less than the amount that has been appropriated. As such, the desired characteristics for appropriations data are listed in Table 3.3:

Table 3.3: Desideratum of Appropriations

- *General Fund Appropriations* for Corrections, Higher Education, and State Total
 - Exclusive of: federal, special, or other funds
 - Inclusive of: operations and capital outlay
 - *Corrections*: Department of Corrections for adult corrections
 - *Higher Education*: Four-year universities

The desired budgetary unit for this study is general fund appropriations. The general fund reflects the major share of a state's fiscal transactions. Utilizing this measure ensures that all monies from special funds, federal sources, and other funds are not included in the appropriations for corrections, higher education and state totals. Consequently, one is able to focus on the pool of state monies available for general state purposes. In addition, it is desired that appropriations from the general fund be inclusive of both monies for operations and for capital outlays. These components of the budget are desirable because they represent aspects that might be impacted by an increasing demand for certain state activities. For example, policy changes and changing exogenous conditions might lead to the expansion of correctional activities. This expansion may necessitate the increase in appropriations for both the operation (e.g., need to hire more correctional officers and prison staffs) and the construction of new facilities or the renovation of older facilities (capital outlay). Thus, it is desirable to contain both fiscal components in a study of budgeting. Finally, it is preferable to focus solely on appropriations for adult corrections and appropriations for four-year universities. This

allows the level of analysis to remain focused on the state level and not on the interrelation that might exist between the state and localities.

However, due to difficulties in obtaining the desired data from various legislative analyst's offices, budget and management offices, departments of corrections, departments of education, and a multitude of national organizations (e.g., National Association of State Budget Officers; National Institute of Corrections) the data that could be obtained does not fully meet the desideratum of appropriations. Table 3.4 outlines the data that was obtained, the sources of the data, and defining attributes. Nevertheless, the deviations from the desired characteristics of appropriations will not invalidate the results of this study. Relationships that characterize the budgetary process can still be examined. However, it does mean that a pooled analysis incorporating cross sectional variation is not possible since units of measurement across the states are not comparable, while a direct comparison of empirical results between states must be done with caution.

Table 3.4: Appropriations Data – Title, Source, and Notes About the Data

California Appropriations: Corrections, Higher Education, Total

Description: “State General Fund Appropriations for State Government Functions, State Operations and Local Assistance in Actual and 1999-2000 Constant Dollars for Fiscal Years 1967-68 Through 1999-2000.”

Sources: California Postsecondary Education Commission, Fiscal Profiles, 1999
www.cpec.ca.gov

Notes: Utilize actual dollar amounts, not constant dollars
All monies for capital outlays are not in display
Corrections is both Youth and Adult Corrections
Higher Education includes local community colleges and 4-year public colleges and universities

Michigan Appropriations: Corrections, Higher Education, Total

Description: Michigan General Fund/General Purpose Appropriations

Source: Executive Budget of the Governor of Michigan

Notes: Includes both capital and operations
Higher Education includes only 4-year public colleges and universities

Virginia Appropriations: Corrections

Description: “Approximate Appropriations Related to Operating Expenses for Housing State Inmates, 1970-2002.”

Source: Dick Hall-Sizemore, Department of Planning and Budget, VA

Notes: General Funds Only; operating expenses

Virginia Appropriations: Higher Education

Description: “Appropriation History for Fiscal Years 1970-71 through 1999-2000.”

Source: A. Fletcher Magnum, State Council of Higher Education, VA

Table 3.4 (cont): Appropriations Data – Title, Source, and Notes About the Data

Notes: Total appropriations for four year colleges and universities (excludes two year institutions) from General Fund

Virginia Appropriations: Total

Description: “History of Appropriations for Operating Expenses”

Source: Mike Barton, Department of Budget and Planning State of Virginia

Notes: Actual appropriations for operations from the General Fund.

Exogenous Factors

Violent Crime Rate: The crime rate is measured by utilizing reported figures from the *Uniform Crime Reports* as produced by the Federal Bureau of Investigation and made available by the Bureau of Justice Statistics. For purposes of this study the violent crime index, which is an estimation of offenses known to police per 100,000 inhabitants, is utilized. This index is comprised of the following Part I offenses: murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated and simple assault. Data was obtained from an annual publication entitled *The Sourcebook of Criminal Justice Statistics*, produced by the United States Department of Justice. It should be noted that the use of data from the *Uniform Crime Reports* is often subject to criticism. Critics (Skogan 1974; Siedman and Couzens 1974) claim that this measure represents a deflated estimate of the amount of criminal activity, because it relies solely on offenses

known to police. Thus, it is argued that only a small portion of criminal activity is ever reported and that the index is susceptible to changes in administrative procedures (Siedman and Couzens 1974). Nevertheless, this measure is appropriate for this study since media outlets and politicians often make reference to this statistic and it has become a part of public discourse surrounding issues of public safety. As such, it is an instrument that might be interpreted by policymakers as a signal for policy relevant conditions.

Enrollment: The number of students enrolled in institutions of higher education is measured by utilizing data from the National Center for Education Statistics, Higher Education General Information Survey and the Integrated Postsecondary Education Data System. The measure itself represents the total number of students enrolled in the fall semester, inclusive of public four-year institutions of higher education.

Cohort: The size of the 18-24 cohort is measured by utilizing data from the United States Census Bureau's population statistics. Specifically, the data comes from reports entitled "Population Estimates for the U.S., Regions, and States by Selected Age Groups and Sex: Annual Time Series;" "Historical Annual Time Series of State Population Estimates and Demographic Components of Change 1980 to 1990, by Single Year of Age and Sex;" and "Intercensal Estimates of the Resident Population of States 1970 to 1980."

Political Ideology: The issue of the political ideology of the state government is captured in a dichotomous variable that treats a Republican governor as being synonymous with a 'conservative' state government and a Democratic governor with a 'liberal' state government. The party of the governor was chosen because the governor represents a strong political force in the budgetary process at the state level. The

governor not only appoints agency leaders who make requests for funds, but also is responsible for preparing the executive budget that establishes priorities and provides direction for state government and policy. An alternative measure constructed by Berry, Rinquist, Fording, and Hanson (1998) was considered because it represents a more complete specification as it accounts for the ideology of the governor and each house in the state legislature. However, data for this measure only exists through 1995, which would severely curtail the scope of this study and make it impossible to investigate the impact of policies that were implemented in the latter half of the 1990's.⁶

Unemployment: This measure is being used as a proxy for state economic well-being. As such, during economic downturns states face revenue shortages and may redirect resources away from discretionary areas of the budget and move them towards mandated areas of the budget. Unemployment is operationalized as the unemployment rate, which represents the number of unemployed as a percent of the labor force, in each state for each fiscal year. According to the Bureau of Labor Statistics, unemployed refers to all persons who had no employment during the reference week, were available for work, except for temporary illness, and had made specific efforts to find employment some time during the 4-week-period ending with the reference week. Persons who were waiting to be recalled to a job which they had been laid off need not have been looking for work to be classified as unemployed. Data comes from the Bureau of Labor Statistics, using data from the Current Population Survey (CPS) as collected by the Bureau of the Census.

⁶ Correlations between the dichotomous variable for partisanship of the governor and Berry et al.'s (1998) measure were run for California between 1969 and 1995. The results produced a correlation coefficient of .944, confirming the reliability of the alternate construct.

Overview of Budgeting Patterns In California, Michigan, and Virginia

Before the estimation strategy is introduced the three key budgetary variables, appropriations for corrections, appropriations for higher education, and the size of the budgetary pie, are outlined for each of the three states in the study.

California -- Appropriations

An examination of Figure 3.2 reveals that state General Fund appropriations for corrections and higher education both rose significantly between FY 1969 and FY 1999. Over this time period, appropriations for corrections increased from \$161 million to \$4.7 billion equating to a 2,843 percent increase. Similarly, appropriations for higher education rose from \$733 million to \$8 billion over this same time period, for a percent increase of 993. As such, it can be inferred that corrections was growing at a faster rate than higher education during this time span. In addition, an inspection of the two budgetary series shows that the budget for corrections is less volatile than for higher education. Appropriations for corrections grew slowly and steadily between FY 1969 and FY 1976. In FY 1977 the rate at which appropriations for corrections was increasing began to rise and this rate increased even more following FY 1983. In contrast, higher education grew fairly steadily between 1969 and 1979, and then experienced a period of little growth between FY 1980 and FY 1983. Following this period of limited growth, appropriations for higher education continued to grow in FY 1984 until FY 1992 and FY 1993 when the amount appropriated declined from the previous year. Finally, a resurgence in growth occurred between FY 1994 and FY 1999. Nevertheless, viewing appropriations for each budgetary category independent of the impact of the size of the

state budget gives an incomplete picture. In order to get a better understanding of changes to departmental appropriations over time, it is necessary to examine the budgetary allocations in the light of the entire state budget. Thus, the level of appropriations are converted into a percentage of the total state appropriations.

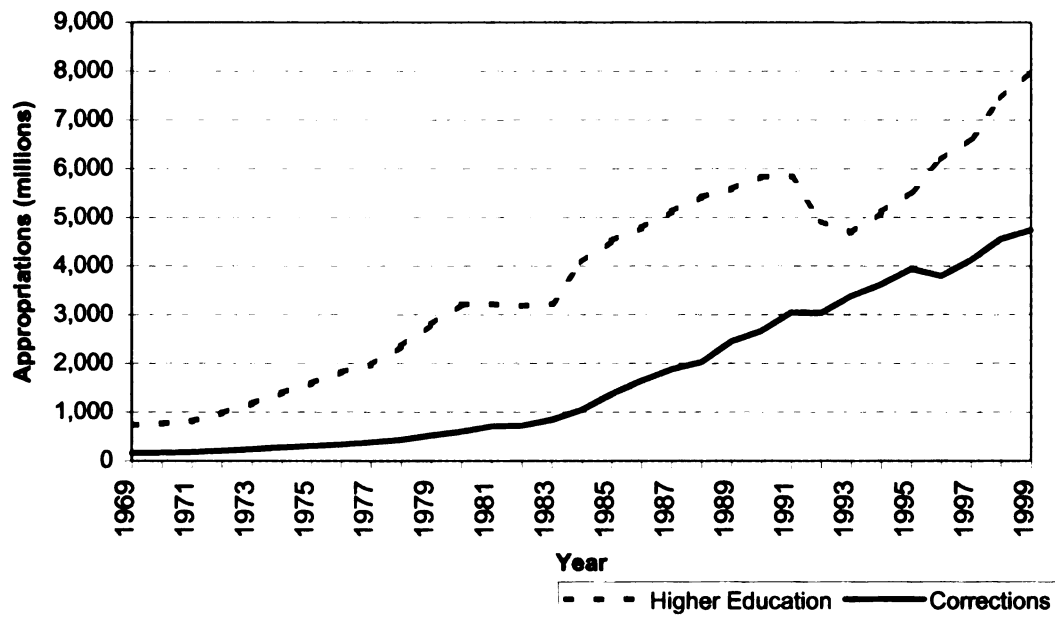


Figure 3.2: State of California: Corrections and Higher Education Appropriations (GF): FY 1969-1999

A visual inspection of Figure 3.3 reveals that between FY 1969 and FY 1993 the percent of the state budget appropriated for corrections has increased while the percent allocated towards higher education has declined. Corrections grew from 3.7 percent of the state budget in FY 1969 to 8.7 percent of the budget in FY 1993. Over this same time period the percentage for higher education declined from roughly 16.8 percent to 12 percent. In contrast, between FY 1994 and FY 1999 higher education grew to 12.6 percent of the

state budget, while corrections declined to 7.4 percent. While the existence of an apparent tradeoff between corrections and higher education may manifest itself in a depiction of state budgetary categories as a percentage of the state budgetary total, an examination of empirical results is warranted before such conclusions are reached.

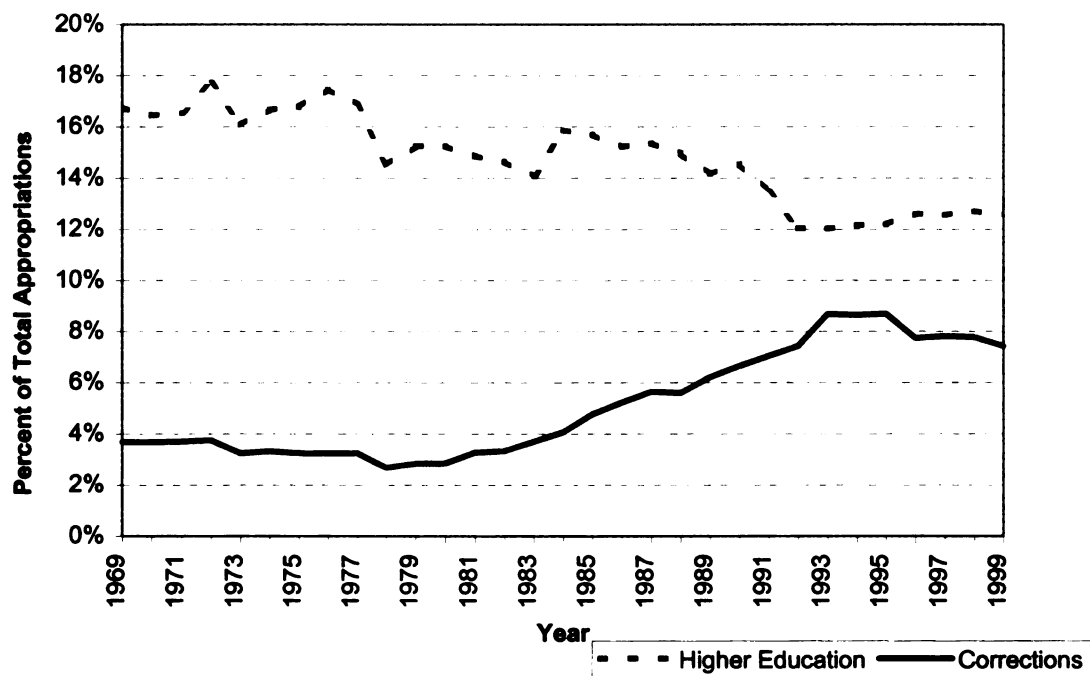


Figure 3.3: State of California: Percent of Appropriations from Total State Appropriations (GF): FY 1969-1999

Michigan – Appropriations

An examination of Figure 3.4 reveals that General Fund/General Purpose (GF/GP) appropriations for both corrections and higher education rose between Fiscal Year (FY) 1969 and FY 2000.

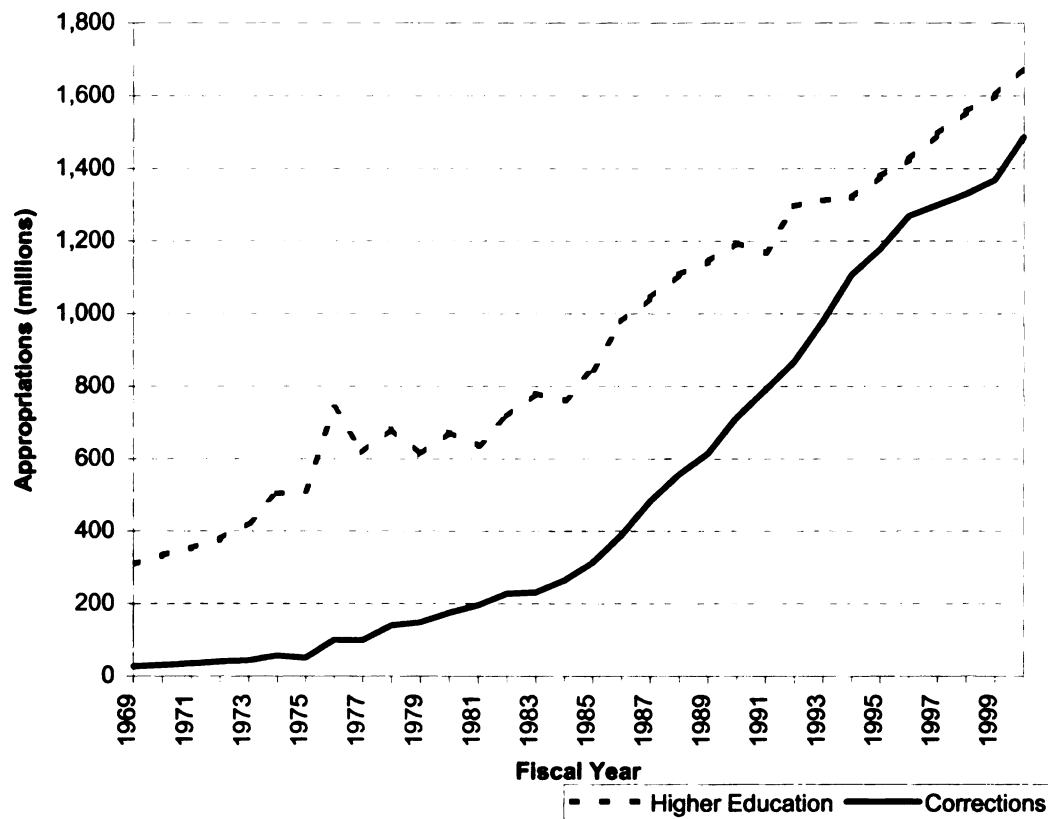


Figure 3.4: State of Michigan: Corrections and Higher Education Appropriations (GF/GP): FY 1969-2000

During this time period, appropriations for corrections rose over 5,400 percent from approximately \$26.9 million in 1969 to \$1.49 billion in FY 2000, while appropriations for higher education rose over 445 percent from \$307.8 million to \$1.68 billion over the same period. Thus, it can be seen that appropriations for corrections were growing at a faster rate than appropriations for higher education. However, to gain an understanding of the impact of the size of the entire state budget on growth, for specific departments, it is useful to examine the level of appropriations as a percentage of the total GF/GP appropriations.

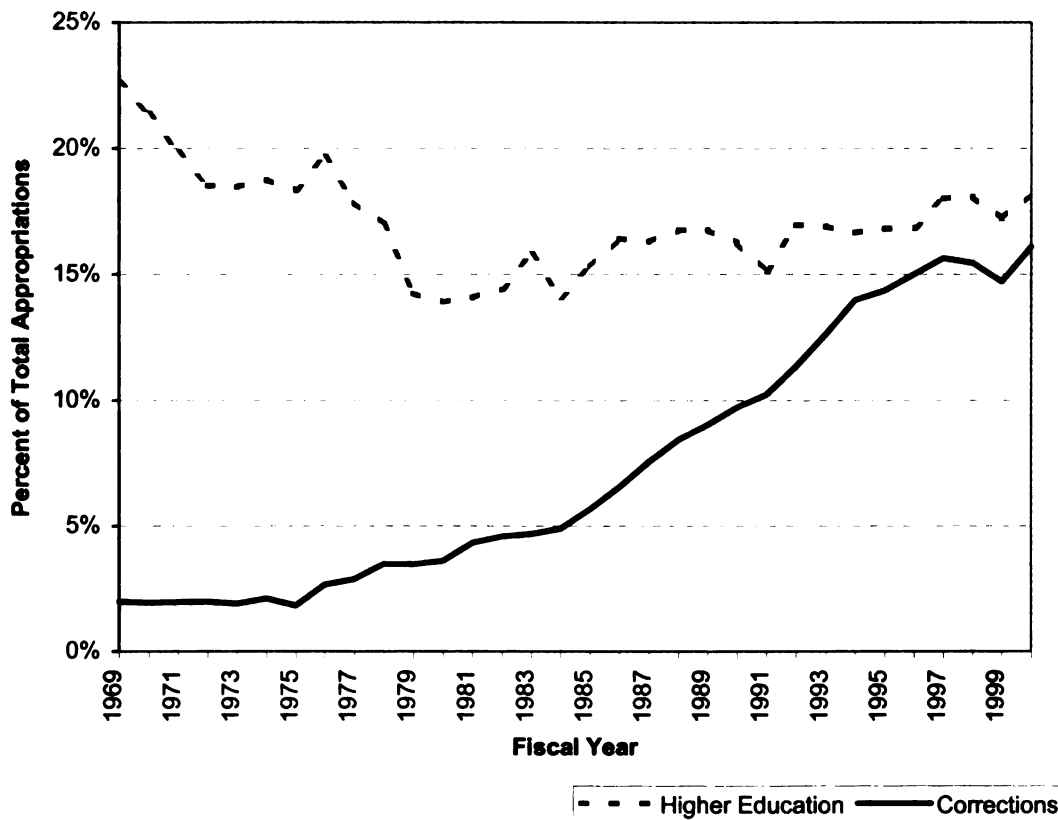


Figure 3.5: State of Michigan: Percent of Appropriations from Total State Appropriations (GF/GP): FY 1969-2000

A visual inspection of Figure 3.5 reveals that between FY 1969 and FY 2000, the percent of the state budget allocated towards corrections grew significantly from roughly two percent to 16.1 percent of the entire state budget. Over this same time period the percentage for higher education declined from roughly 22.6 to 18.2 percent. Despite the presence of a negative correlation between the two trends, one cannot infer that there is a tradeoff between appropriations for corrections and higher education. Nevertheless, the Michigan Council on Crime and Delinquency, citing studies from fiscal analysts within the Michigan House of Representatives, assert that “the dramatic expansion of the

corrections industry in Michigan has resulted in destabilization of other state budgets as monies are taken from other areas to fund corrections” (Michigan Council on Crime and Delinquency, 10).⁷ This apparent change in priority is one issue to be explored in the data analysis that follows.

Virginia – Appropriations

General Fund appropriations for corrections grew from roughly \$13.5 million in FY 1971 to over \$573 million in FY 1999. This equates to a growth rate of 4,148%. Over this same time period general fund appropriations for four-year colleges and universities (higher education) grew from \$85.6 million to \$819 million, or a percentage increase of 856%. Appropriations for corrections grew at a slow and steady rate until FY 1976 when the rate of growth increased. Another increase in the rate of growth occurred in the late 1980's and early 1990's. Overall, the series for corrections seems to increase without much fluctuation. In contrast, the series for higher education appropriations is characterized by a period of decline. Appropriations for higher education increases at a fairly steady rate between FY 1971 and FY 1978, at which point the rate of growth increases. This growth hits its peak in FY 1990 when appropriations were roughly \$640 million. This was followed by a period of decline where appropriations fell to under \$550 million in FY 1993. The next three fiscal years were characterized by limited growth until FY 1997 when appropriations for higher education increased at a very rapid

⁷ In 1978 Michigan adopted the Headlee amendment to the Michigan Constitution. Article IX, Section 29 of the Constitution implies that the state cannot reduce financing to any existing activity or service required of units of local government by state law. It mandates that the proportion of total state spending paid to all units of Local Government taken as a group, shall not fall below 41.61%.

pace. Between FY 1996 and FY 1999 appropriations for higher education increased from \$588 million to \$819 million, or an increase of 40% in the amount appropriated.

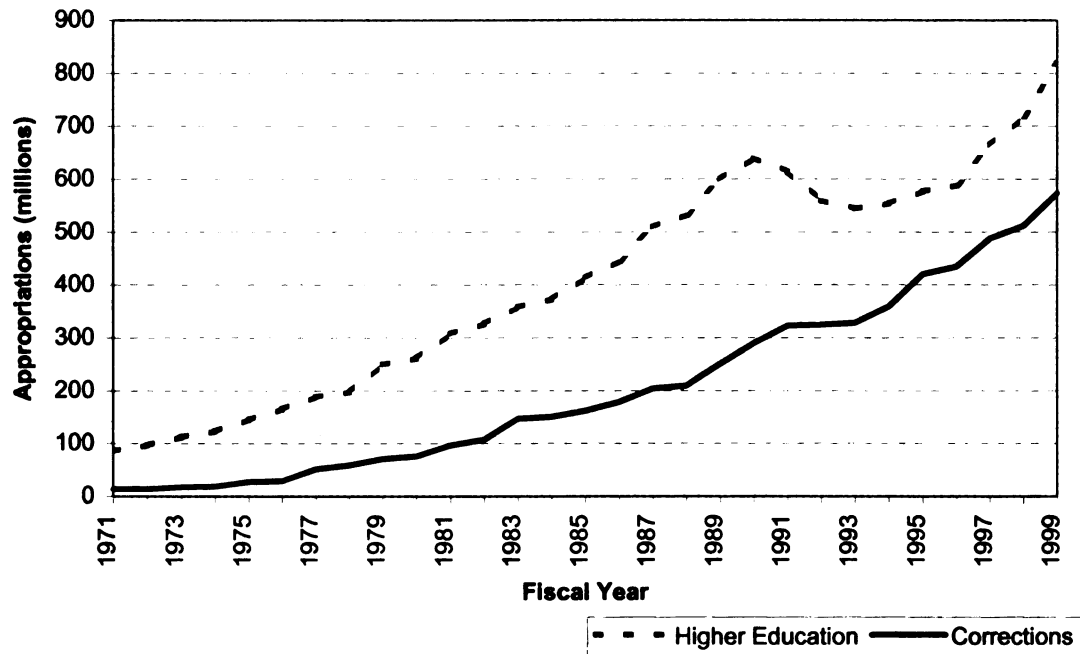


Figure 3.6: State of Virginia: Corrections and Higher Education Appropriations (GF): FY 1971-1999

In order to get a sense of the potential tradeoff that might exist between appropriations for corrections and appropriations for higher education, a visual inspection of Figure 3.7 is warranted. Figure 3.7 illustrates appropriations for corrections and higher education as a percentage of the total state budget. The percent of the state budget appropriated for corrections rose gradually between FY 1971 and FY 1999 from 1.6% to 6.5%. In contrast, higher education declined from 9.9% in FY 1971 to 9.2% in FY 1999. However, the percent appropriated for higher education hovered between approximately 10-11 percent between FY 1971 and FY 1990, with a high of 11.7% in FY 1990.

Beginning in FY 1991, the percent of appropriations for higher education declined to a low of 7.8% in FY1996. Finally, the percent appropriated for higher education rose at the end of the 1990's. The end result is that the gap between the two budgetary categories closed, and as visually expressed in Figure 3.7, a bottleneck shape characterizes the two series.

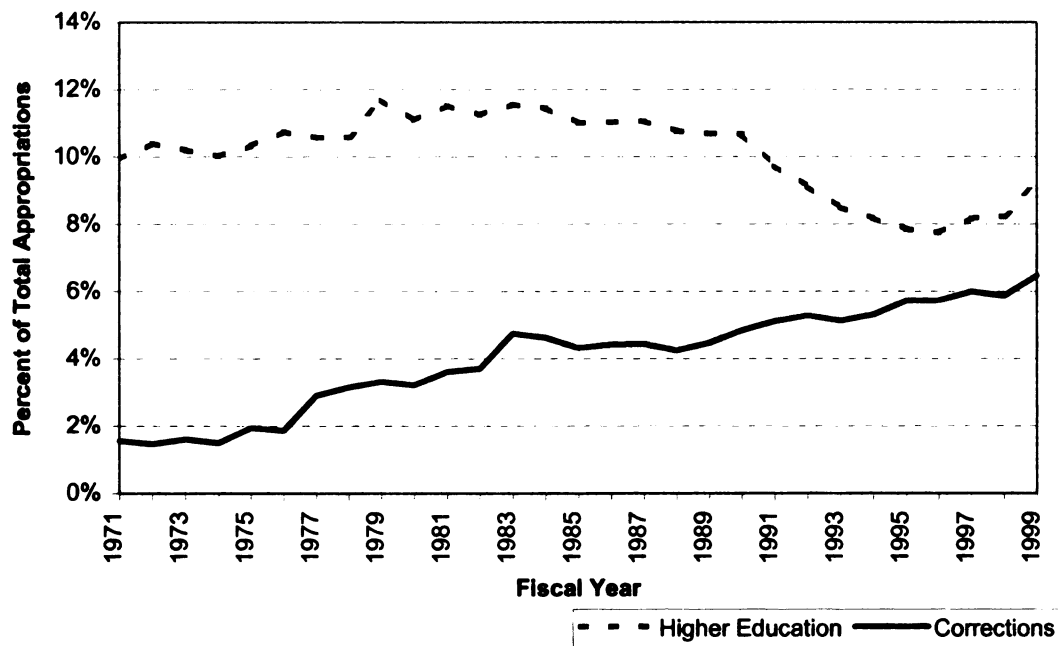


Figure 3.7: State of Virginia: Percent of Appropriations from Total State Appropriations (GF): FY 1971-1999

Estimation Strategy

The model of the budgetary process for corrections and higher education represents a system of simultaneous equations. The equations are simultaneous because endogenous variables in one equation appear as explanatory variables in another equation of the system (e.g., C_t and E_t).

$$C_t = b_{10} + b_{11}E_t + b_{12}(P_t - P_{t-1}) + b_{13}Unemp_{t-1} + b_{14}Cohort_{t-1} + b_{15}Governor_{t-1} + b_{16}ViolentCr_{t-1} + \sum_{p=1}^P \gamma_p Z_{pt} + e_{1t}$$

$$E_t = b_{20} + b_{21}C_t + b_{22}(P_t - P_{t-1}) + b_{23}Unemp_{t-1} + b_{24}Cohort_{t-1} + b_{25}Governor_{t-1} + b_{26}Enrollment_{t-1} + e_{2t}$$

As a result, the endogenous variables are correlated with the stochastic disturbances (e_t) and applying ordinary least squares (OLS) results in biased estimators (Kennedy 1993, 151).⁸ Therefore, the equations must be estimated simultaneously. However, before the estimation procedure can be initiated the problem of identification must be addressed.

The identification problem asks if one can obtain unique numerical estimates of the structural coefficients. The identification problem is a modeling problem and can be resolved by specifying an appropriate set of restrictions. Gujarati notes that “[f]or an equation to be identified ... it must be shown that the given set of data will not produce a structural equation that looks similar in appearance to the one in which we are interested” (659). In other words, additional information is needed in each equation to set it apart from the other, in order for parameter estimates to be obtained. This can be

⁸ OLS assumes that causation is unidirectional, an assumption that is violated when there is endogeneity or feedback in a system.

accomplished by utilizing the order condition⁹ which states that in order for an equation to be identified, the number of predetermined variables (exogenous) excluded from the equation must not be less than the number of endogenous variables included in that equation less one (Hanushek and Jackson 1977, 665). Thus, there needs to be enough exogenous variables excluded from the equation to provide an instrumental variable for each of the endogenous variables appearing as regressors in that equation (Kennedy 1992, 165). In addition, the instrumental variables need to be uncorrelated with the error term. A failure to find instruments that are not correlated with the error term could lead to estimates that are biased and inconsistent. Furthermore, it is possible that collinearity may arise because the instrumental variables act as a linear combination of the other variables. As such, Wooldridge (2000) notes that multicollinearity can be more problematic for 2SLS than OLS. Once the model is identified and potential pitfalls with selecting an instrument have been avoided, the model can be estimated. The instrumental variables that are used in the present study are enrollment for the estimation of corrections and the violent crime rate and the policy variables for the estimation of higher education.

The simultaneous equation model is estimated by utilizing two-stage least squares (2SLS).¹⁰ By applying two separate applications of OLS, the correlation between the endogenous variables and the error terms is eliminated. The estimation procedure works by regressing the endogenous variable being used as a regressor on all exogenous variables in the system. The predicted value of the endogenous variable is then used to estimate the structural equation. This process ensures that the parameter estimates are

⁹ The order condition is a necessary but not sufficient condition.

¹⁰ 2SLS will be accomplished by utilizing Stata and the *ivreg* function.

unbiased and consistent and that the instrumental variables are not correlated with the error term (Kennedy 1992, 159). An example of the procedures surrounding 2SLS follows.

In order to estimate the higher education equation, that contains the endogenous corrections variable, identification must first be achieved. This is accomplished by utilizing variables not included in higher education equation, the violent crime rate and the corrections policies, as instrumental variables. These instruments need to be correlated with the endogenous corrections variable and not correlated with the error term of the higher education model. Once the instruments have been selected and the order condition satisfied, estimation can proceed. The estimation procedure occurs in two steps. In this example, the first step estimates the fitted values of the reduced form of the corrections equation. This stage of estimation purges C_t of its correlation with the error term in the higher education equation. The reduced form is as follows:

$$C_t = \Pi_{10} + \Pi_{11}E_{t-1} + \Pi_{12}Enroll_{t-1} + \Pi_{13}(P_t - P_{t-1}) + \Pi_{14}VC_{t-1} + \Pi_{15}Gov_{t-1} + \Pi_{16}Unem_{t-1} + \Pi_{17}Coh_{t-1} + \Pi_{18}Deter_{t-1} + \Pi_{19}BillR_{t-1} + \Pi_{110}Three_{t-1} + e_{1t}$$

In the reduced form equation, the endogenous variable higher education has been removed and the exogenous variable enrollment has been added. For estimation to be unbiased and consistent, unemployment and the policy variables (Deter, BillR, and Three) must be correlated with C_t . In the first stage, OLS regression produces fitted values for C_t . These fitted values are then substituted into the higher education equation in place of C_t . The second stage estimates appropriations for higher education using OLS. For each state under study in this dissertation, results of two separate regressions of the second stage of the 2LS estimation are presented. The first regression includes

corrections as the dependent variable and the second includes higher education as the dependent variable. If all previously stated conditions are met, all aspects of OLS interpretation apply to the second stage of 2SLS.

Once the 2SLS results have been generated, separate OLS regressions are run for both the corrections and higher education models with the endogenous explanatory variables removed from the equation. Estimating OLS equations absent the endogenous explanatory variables allows for a specification test to be conducted that explicitly tests for simultaneity. As such, the Durbin-Wu-Hausman test is used to examine if the difference in the coefficients between the instrumented and OLS model are in fact systematic. If the null hypothesis (difference in coefficients are not systematic) can be rejected, then it can be inferred that there is a simultaneous equation bias and the standard OLS estimates are inconsistent. If the null cannot be rejected then the OLS estimates are consistent and explicit interdependence between appropriations for corrections and appropriations for higher education can be abandoned.

The Durbin-Wu-Hausman test could lead to three potential outcomes in the present study. The first scenario is where it is found that there is systematic bias in the estimation of both corrections and higher education using OLS. In this case, 2SLS is the most applicable procedure. The second scenario is when there is no systematic difference in the estimation of appropriations for corrections and appropriations for higher education using OLS when compared to 2SLS estimation. Finally, the third scenario is one in which one of the OLS equations (e.g., higher education) is found to have systematic differences and the other equation does not (e.g., corrections). This recursive system is one in which there is unidirectional dependency among the endogenous variables. In the

example provided, appropriations for corrections is found to be a determinate of appropriations for higher education, but appropriations for higher education is not found to be a determinate of appropriations for corrections. For scenarios two and three explicit interdependence can be ruled out and 2SLS is no longer applicable. However, the equations in scenarios two and three might still be connected through their error terms. Therefore, when 2SLS is forsaken, an alternative view of interdependence, seemingly unrelated regressions, is pursued.

When explicit interdependence between two series has been ruled out it is still possible that the error terms of the two equations are correlated. Equations that possess these conditions are called seemingly unrelated regression (SUR) systems, because at first look they appear to be unrelated, but in fact the equations are related through the correlation in the errors. The presence of contemporaneous cross-equation error correlation leads to least squares estimates that are biased and no longer efficient. Efficiency can be improved by estimating the equations as a set, using a single large regression.¹¹ Beyond asymptotically more efficient estimates, the SUR procedure generates a correlation matrix of the residuals between the two series and the Breusch-Pagan test. This test is asymptotically distributed chi-square and is used to test the null of no correlation between the residuals and to see if the variance-covariance matrix of the residuals is diagonal. Since the residuals of a regression analysis represent the unobserved or stochastic element of the model, one could assume that if the residuals of the two series were significantly correlated then what is driving the unexplained portion of the models are a function of similar processes or variables. If they are not correlated,

¹¹ Zellner and Huang (1962) point out that when both equations contain the same variables there is no gain relative to OLS.

we can then assume that the two series are unrelated and being driven by separate processes (e.g., corrections does not influence higher education and vice versa) (Simon, Ostrom, Marra, 1991). As such, the seemingly unrelated regression approach provides an unobtrusive way of looking at the relationship between corrections and higher education and the impact of policies and exogenous factors on the budgetary process.

Now that an estimation procedure has been laid out that allows for the various hypotheses to be tested, a discussion follows that provides an overview of issues associated with using time series data. The first issue to be covered is the lag structure of variables in time series followed by issues of stationarity, spurious regression, and unit roots.

Time Series Issues – *Lags*

This study makes use of time series data to investigate dynamic causes of the budgetary process¹² and as such necessitates that the lag structure of the variables be discussed. When considering the impact of various factors on budgetary appropriations the dependent variables (corrections and higher education) are treated contemporaneously. As far as the independent variables are concerned it makes no sense to treat them as contemporaneous, thus the variables must be correctly specified in regards to time.¹³ In other words, the appropriate lag structure must be determined. Therefore, Tucker (1982) asserts that it is important to think about the relation variables may have in regards to the budgetary cycle. An example, adopted from Tucker (1982) is

¹² Utilization of time series data allows for moments of the distribution to change over time.

¹³ This holds for all independent variables except for the endogenous variables of corrections and higher education.

utilized to show how variables from earlier time periods ($t - n$) affect budgetary appropriations at time t .

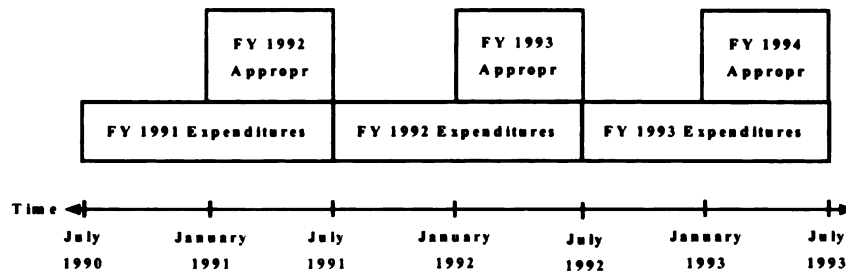


Figure 3.8: An Illustration of Time and the Budgetary Cycle, Appropriations and Expenditures

The figure above shows the periods of budgetary negotiations surrounding appropriations and the periods of government expenditure. The period of budgetary negotiations and requests for appropriations for a specific fiscal year pre-dates the subsequent fiscal year expenditures. Tucker notes that

approximately 12 months before the fiscal year or biennium begins, individual agencies start to develop their budget requests. A few months later these requests are forwarded to officials – usually agents of the governor – who are authorized to develop a comprehensive budget. The comprehensive budget is presented to the state legislature early in its session, and legislative appropriations are passed before the fiscal year or biennium begins... Expenditures take place throughout the fiscal year or biennium (177).

Therefore, when considering the impact of environmental stimuli (exogenous and political factors) on the budgeting process one must decipher what information is available at the time of the negotiations. Ostrom and Marra (1986) note that

“[i]nformation having utility for decision makers must be available at the time decisions

are made” (827). In the figure above it can be seen that the earliest that information would be available for legislators and policymakers when determining appropriations for FY 1992 is 1990. So for example, increases in the unemployment rate in 1990 may impact budgetary appropriations in FY 1992. Similarly, appropriations in FY 1993 would be impacted by factors in 1991. Thus, the exogenous variables and impact of public policies in this study will be lagged two years to capture their impact on the budgetary process.¹⁴

Time Series Issues – *Stationarity*

An additional issue to consider when using time series data is the concept of stationarity. Before modeling and estimation of a time series can take place one must achieve stationarity. Stationarity means that the properties of the distribution are unaffected by changes in time origin (Mills 64). This implies that the sample moments of the mean and variance must be unconditional, finite, and independent of time and finally that shocks are transitory.¹⁵ The presence of nonstationary data makes the use of statistics such as the t and R^2 inappropriate and the running of regressions with this data may produce spurious results (Kennedy 252).

¹⁴ An alternative way to determine the lag structure would be to utilize reduction theory to move from a general to a specific framework. This framework employs various diagnostics in order to drop lags to obtain models that are theoretically and statistically defensible. Granato (1991) notes that “reduction theory affords the analyst a rigorous methodological basis for reducing the number of right-hand-side variables with no loss of relevant information to the parameters of interest” (125). While it is desirable to include a multitude of lags for each variable, the small number of data points in this study creates a degrees of freedom problem and thus makes this impossible in this study.

¹⁵ Stationarity that focuses solely on the first two moments is referred to as second-order or weak stationarity. In contrast, strict stationarity is characterized by a joint distribution that is the same throughout the series. When normality is assumed, weak and strict stationarity are identical. Nevertheless, meeting the conditions of weak stationarity is sufficient for most time series analysis.

Spurious regression results whenever two or more variables are regressed on one another that are not $I(0)$. If the dependent and explanatory variables possess a stochastic trend, the fit of the estimated equation appear to be meaningful, even if the variables are actually unrelated. The large t-values and R^2 are therefore spurious. Granger and Newbold (1974) regressed two variables that were independent random walks on one another and found via simulation that the slope coefficient had a significant t-value 77 times out of a hundred when significance was only anticipated five percent of the time (Type I error). The authors concluded that regressions attempted with nonstationary data yield invalid standard errors and test statistics. Therefore, in order to begin a process of model generation, it must be ensured that the stochastic properties of the dependent variable are invariant with respect to time, which enables certain asymptotic properties of regression estimates to hold.

Several processes are undertaken to ensure that the series are stationary. The first is accomplished through a visual inspection of the data. Plotting the individual series against time in levels allows one to inspect for trends in the mean or variance, seasonal components, or long swings associated with unit roots. A stationary series is one that visually is flat without a time trend, lacks a change in variance, and has no periodic fluctuations. Another method undertaken is the Box-Jenkins approach, which relies on the inspection of correlograms and resultant autocorrelations and partial correlations to deduce whether series are stationary and error terms are white noise. For example, a stationary AR process possesses autocorrelations that die out rapidly over time.¹⁶ If

¹⁶ Autocorrelation functions (ACF's) measure the extent to which one value of the process is correlated with previous values. It focuses on the strength and memory of the process (Mills 78). Partial autocorrelation functions (PACF's) measures the correlation between time series observations that are k periods apart after controlling for correlations at intermediate lags (Gujarati 739).

stationarity is not deduced then a series of transformations are undertaken. Generally speaking, taking the natural log of a series is a way to stabilize variance and differencing the data is a way to remove trends and eliminate systematic changes in the mean. First differencing is accomplished by subtracting the lag of a series from the contemporaneous series.

$$\Delta Y_t = Y_t - Y_{t-1}$$

If data are integrated of the first order, then the operation of first differencing transforms an I(1) series into a stationary series.

A specific case of nonstationarity is the unit root. A unit root is characteristic of a series that possesses a random walk with drift and is integrated of the first order. It implies that the series of the dependent variable does not possess an unconditional mean and variance. Additionally, unit roots are characterized by long stochastic swings without returning to a constant mean level and the effect of shocks to these processes persists indefinitely. An example of a unit root can be seen when viewing the following first order autoregressive process (AR(1)).

$$Y_t = \rho Y_{t-1} + u_t$$

A unit root exists when $\rho = 1$ and stationarity exists when $|\rho| < 1$ and thus I(0).¹⁷ The presence of a unit root process is problematic for statistical inference in that the standard t statistics do not apply. Viewed in this light, tests for stationarity are tests for $\rho = 1$ and thus tests for unit roots (Kennedy 253). A formal testing for unit roots are conducted through an application of the Augmented Dickey-Fuller (ADF) test.

¹⁷ When $\rho > 1$, the series will exhibit explosive behavior.

The ADF test statistically tests the data generating process for nonstationarity versus stationarity. This test is a modification of the original Dickey-Fuller (DF) test that is incapable of generating accurate results in the presence of serial correlation. Conversely, the ADF test absorbs serial correlation that might be present in the data by incorporating a lag of the variable under study plus lags of the first difference of the variable. This addition to the DF test allows the autocorrelated error term to remain free of the effects of serial correlation. Therefore, when utilizing the ADF with MacKinnon critical values for the rejection of the null hypothesis, one can make an accurate assessment of whether or not a unit root exists. The ADF test applies the following restrictions:

- 1) no intercept, no trend
 $\Delta Y_t = \phi Y_{t-1} + \sum \rho \Delta Y_{t-i} + \varepsilon_t$ where:
 $H_0: \phi = 0$; unit root (random walk)
 $H_A: \phi \neq 0$; no unit root (stationarity)
- 2) intercept, no trend
 $\Delta Y_t = \alpha + \phi Y_{t-1} + \sum \rho \Delta Y_{t-i} + \varepsilon_t$ where:
 $H_0: \phi = 0$; unit root (random walk with drift)
 $H_A: \phi \neq 0$; no unit root (stationarity)
- 3) intercept and trend
 $\Delta Y_t = \phi Y_{t-1} + \sum \rho \Delta Y_{t-i} + \varepsilon_t$ where:
 $H_0: \phi = 0$; unit root (random walk with drift around a deterministic trend)
 $H_A: \phi \neq 0$; no unit root (stationarity)

Unit root tests are applied to all continuous variables to ensure that the variables are $I(0)$ in order to achieve balance and avoid spurious regressions.

In order to make the procedures associated with stationarity clear, an example utilizing enrollment in public four-year institutions of higher education in California is outlined. Table 3.5 illustrates the output for the ADF test under three restrictions. Enrollment in levels is significant at the .10 level under restriction two and .05 under

restriction three. This suggests the presence of a unit root cannot be rejected and the series needs to be transformed to induce stationarity. When the first difference is taken, the ADF statistic is significant at the .01 level for all three restrictions suggesting that the null of a unit root can be rejected.

Table 3.5: Augmented Dickey-Fuller Test: Unemployment Rate in California

	No Trend, No Intercept	Intercept, No Trend	Intercept and Trend
Enrollment	.901	-2.644*	-3.948**
Enrollment (d1)	-4.44***	-4.504***	-4.366***

The effect of first differencing can be seen in Figure 3.9. By first differencing the enrollment rate becomes stationary. This series is visually flat, fluctuates around a mean of zero, lacks a time trend, and has no periodic fluctuations.

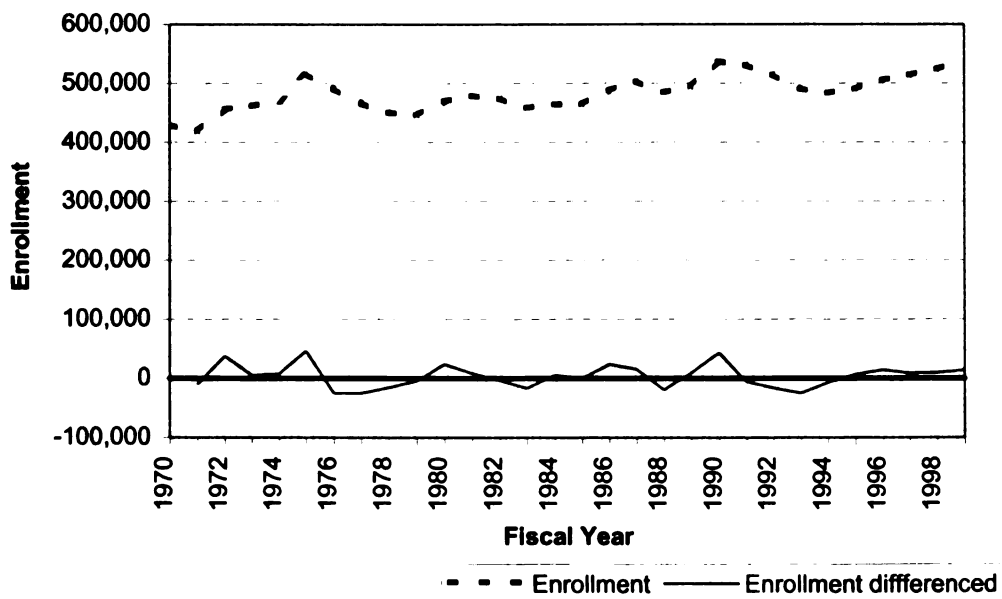


Figure 3.9: Illustration of Stationarity via Differencing: Enrollment in California

Inducing stationarity via the transformation of variables by differencing is undertaken to avoid spurious regression. Nevertheless, some scholars have claimed that differencing can also lead to potential problems or limitations. For example, King (1989) notes that “differencing can cancel out the systematic component [relating one series to another]...Thus, as a nearly general rule, models based on differenced series tend to fit less and have higher standard errors and less stable coefficient values” (181). In addition, Durr claims that many critics of ‘prewhitening’ techniques argue that transforming variables leads one to “throw out the baby with the bathwater” (Durr, 164). Finally, Gujarati suggests that “[m]ost economic theory is stated as a long-term relationship between variables in level form and not first differenced” (Gujarati, 725). To account for these concerns and to aid in the interpretation of the estimated coefficients, models are estimated using data in differences and in levels. The results of both estimations are presented and a discussion of interpretation surrounds each, while the primary focus is placed on the outcome that is most plausible.

Estimation Strategy – *Overview*

In conclusion, the estimation strategy proceeds by following two paths. The first path represents the estimation of the system of equations in levels and the second path the estimation of a transformed system of equations to deal with the issue of stationarity. The overall estimation strategy is presented in Figure 3.10. As can be seen path two begins by checking for stationarity and the application of unit root tests. Where

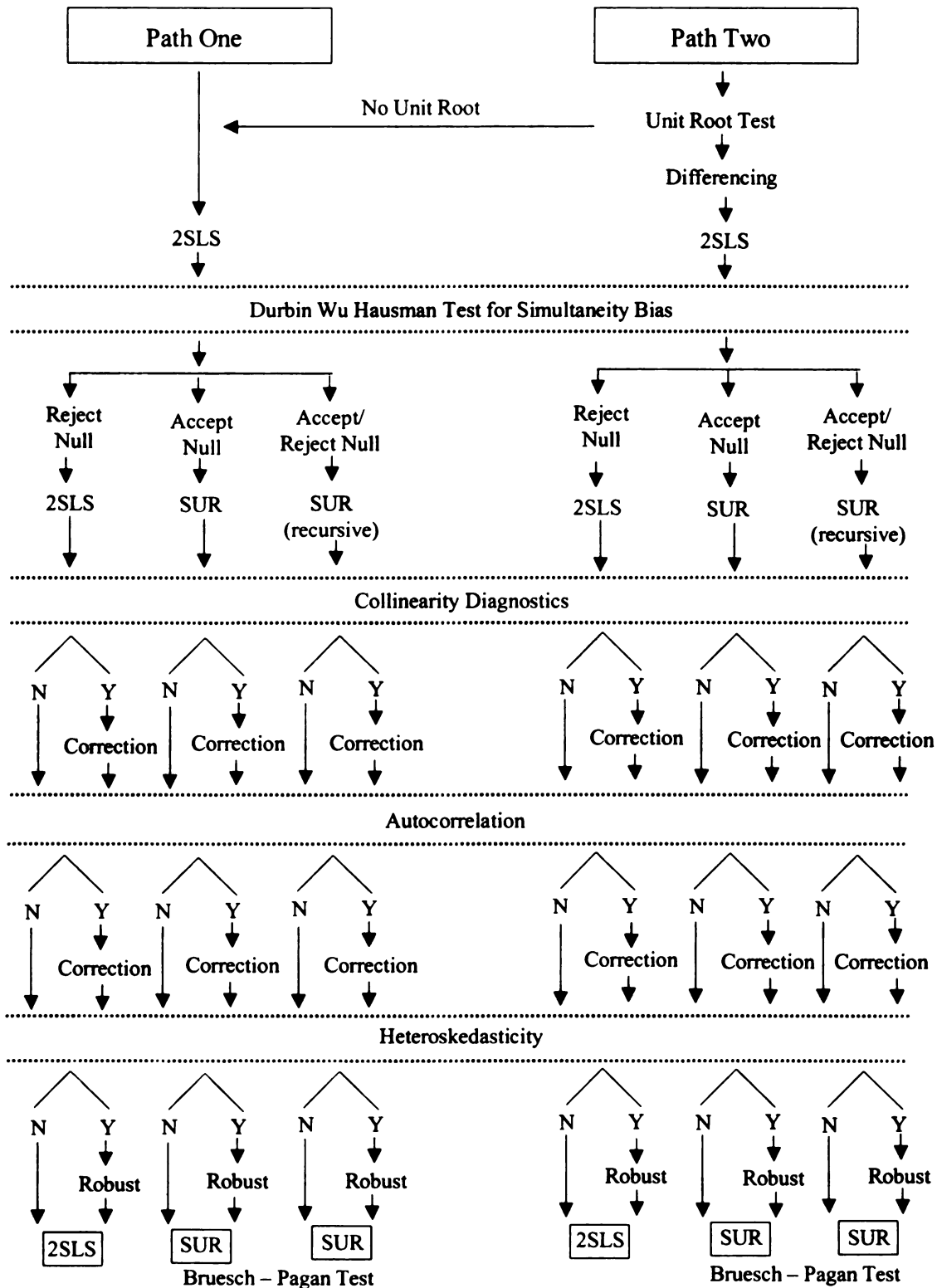


Figure 3.10: Overview of Estimation Strategy

necessary differencing is undertaken to remove unit roots and avoid spurious regression. Once stationarity has been confirmed in path two, both paths proceed by estimating a system of equations using 2SLS. These results are compared to separate OLS estimates using the Durbin-Wu-Hausman test. If the OLS estimates are found to be systematically different, then the OLS estimates are considered inconsistent and in order to avoid simultaneity bias, 2SLS is used as the estimation strategy. If the results are found not to be systematically different, seemingly unrelated regressions are utilized to examine potential correlations that exist among the residuals for either recursive or non-recursive systems.

Following the initial estimation the models will be investigated for multicollinearity. Multicollinearity is a term that refers to correlation among the independent variables in a multiple regression model. Collinearity itself has to do with specific characteristics of the data matrix and as such is a data problem, not a statistical problem.¹⁸ In the presence of multicollinearity, the measured variables are too intercorrelated to allow precise analysis of their individual effect (Greene 418). As the degree of multicollinearity increases, the estimates of the coefficients become unstable and the standard errors of the coefficients become inflated. While the estimates remain unbiased, the tests of significance are impacted as the confidence intervals tend to be larger and t-ratios tend to be insignificant. Belsley, Kuh, and Welsch (1980) comment that “collinearity is a nonstatistical problem that is nevertheless of great importance to the efficacy of least-squares estimation” (86). Testing for the severity of collinearity is accomplished by utilizing the *collin* command in Stata. This diagnostic procedure

¹⁸ Collinearity implies that two variables are near perfect linear combinations of one another. When there is a perfect relationship among the predictors, the estimates of a regression model cannot be uniquely

generates both VIFs (variance inflating factor) for each regressor and a condition number.¹⁹ Following the recommendations of Belsley, Kuh, Welsch collinearity is considered a problem if any variable possesses a VIF value in excess of ten or the condition number is large (30 or higher). Potential solutions to multicollinearity include increasing the sample size or omitting the problematic variables (Gujarati 1995). Following any corrections to account for multicollinearity, the issue of autocorrelation is addressed.

One of the classical regression assumption holds that the disturbance term relating to any observation is not influenced by the disturbance term relating to any other observation (Gujarati). This implies that $\text{Corr}(u_t, u_s) = 0$, for all t not equal to s . When this assumption is false, the errors suffer from serial correlation or autocorrelation. In the presence of autocorrelation the estimated coefficients remain unbiased, but the standard test statistics are no longer valid as variances are inflated. Kennedy (1992) suggests that autocorrelation may arise due to prolonged influence of shocks, inertia, or misspecification (119). The most common form of this problem is first order autocorrelation. This occurs when the disturbance in one time period is a proportion of the disturbance in the previous time period plus a spherical disturbance. Testing for autocorrelation is accomplished by examining the Ljung-Box Q statistic at various lags for the residuals. Corrections to account for autocorrelation are achieved by estimating the equation with the Cochrane-Orcutt iterative procedure.²⁰ Once the issue of

computed.

¹⁹ The condition number of a matrix is the square root of the ratio of the largest to the smallest characteristic root.

²⁰ Cochrane-Orcutt estimation proceeds by regressing the OLS residuals on themselves lagged one period. This produces an estimate of ρ which is used in an iterative procedure to transform the variables until autocorrelation is mitigated.

autocorrelation has been addressed one additional post estimation issue, heteroskedasticity, is examined before inferences can be made.

Heteroskedasticity refers to a condition where there is non-constant error variance. This implies that the error variance changes across observations and the assumption that the variance of each disturbance term u_i is some constant equal to σ^2 is violated. In the presence of heteroskedasticity the estimators remain unbiased, yet they are no longer efficient and the standard errors are overestimated. This may result in statistically insignificant coefficients, which may in fact be significant if the assumption of homoskedasticity is met. Testing for heteroskedasticity is accomplished by utilizing the *hettest* command in Stata, which is an application of the Cook-Weisberg test for heteroskedasticity using fitted values, and examining a plot of the residuals for non-constant variance. If non-constant error variance is found, heteroskedastic consistent estimators are used by applying robust estimation.

Finally, when all of the diagnostics tests have been met, inferences are made deriving from the estimation of equations both in differences and in levels. As such, hypotheses are tested using the results from the estimation of the models in differences and in levels. These results are interpreted and directly compared and discussed in terms of their plausibility. Generating two sets of estimates using different procedures leads to several questions that need to be addressed: what is to be gained by using two different paths? What does it mean if the results generated from the two procedures generate similar results? Different results? On what grounds does one choose between competing results?

Similar to inquiry into any phenomenon, when conducting empirical studies there exists the possibility of equivocality, or multiple interpretations and explanations for a single phenomenon (Weick 1995). Cherryholmes states that it “is possible to describe and interpret any event and object in as many ways as there are describers and interpreters,” however, “[i]t is not possible to treat all beliefs as equally valid” (44). Accordingly, the role of a researcher as an interpreter of phenomenon is to ascertain the meanings and implications of a set of materials (Kritzer 2) that are acceptable, approximating, translations (Mailloux).²¹ Kritzer asserts that in order to be useful for social inquiry, data must be interpreted. In this study of budgeting two paths of inquiry have been prescribed. The two approaches are rigorous in nature, have been chosen as the most applicable for the present research, and are potentially equally valid for the reasons outlined above. However, the question still remains why would one choose to undertake more than one approach?

To answer the question why multiple approaches would be pursued Kritzer (1996) suggests that one way to improve interpretation is to use a triangulation approach. This notion is built on the idea of pinpointing a location by sighting it from different perspectives (12). He goes on to note that “by stretching the limits of the data or the techniques it is possible to arrive at new insights and perspectives that aid in interpreting the results of the overall analysis” (23). Therefore, the two estimation paths in this study represent a design for triangulation to make sense of the factors that influence budgetary appropriations.

²¹ Foucault argues that “each society has its regime of truth ... that is, the types of discourse which it accepts and makes function as true; the mechanisms and instances which enable one to distinguish true and false statements ... the techniques and procedures accorded value in the acquisition of truth” (Cherryholmes 15).

Karl Weick (1995) argues that sensemaking is a social process oriented around making sense of what we see. He argues that “[s]ensemaking is about plausibility, coherence and reasonableness. Sensemaking is about accounts that are socially acceptable and credible” (61). Weick argues that sensemaking is not built around accuracy rather it focuses on explanations that are plausible. The research design as presented represents a vehicle to make sense of the budgeting process. If the two paths produce results that support one another then they will triangulate or point us towards a plausible explanation. When convergence occurs between the two paths, one’s confidence in the conclusions increases. However, if they are not complimentary how will the plausibility of one set of results be established? Or as Menand asks “what makes us decide to do one thing when we might do another thing instead” (35)? The answer to this question can be found in the teachings of pragmatism.

Pragmatists are first and foremost interested in results and consequences of an action. Pierce’s maxim states that the meaning of a concept is found by “trace[ing] out in the imagination the conceivable practical consequences ... of the affirmation or denial of the concept” (Cherryholmes 15). For pragmatists, the meaning of a concept or policy rests solely on the conceivable practical consequences. Pragmatists choose between different alternatives based on the value of the practical consequences and on the basis of satisfaction and fulfillment (52). Richard Rorty proclaims that for the pragmatist “the pattern of all inquiry – scientific as well as moral – is deliberation concerning the relative attractions of various concrete alternatives” (Cherryholmes 117). Similarly, Cherryholmes suggests that “[p]ragmatists are interested in consequences that are

satisfying and desirable. They act as artists as they contemplate outcomes and critics as they assess them” [emphasis removed] (124).

Therefore, when faced with competing interpretations this dissertation seeks guidance from the teachings of pragmatism and scholars who have studied sensemaking. Operating within the contextual framework of political science, policy analysis, and prior studies of budgeting, this dissertation seeks out interpretations that are most plausible and ‘provide the greatest satisfaction.’ The empirical methods and triangulation process that characterize the analysis are a means to an end. They are tools to make sense or interpret phenomenon. Utilizing two paths could potentially lead to four outcomes: both approaches agree in which variables are statistically significant; only one approach produces a significant coefficient for a particular variable; both approaches agree a variable is not significant; and the two approaches lead to opposite conclusions. In the first three cases, the results will be evaluated and conclusions about the hypotheses made using the lens of triangulation. In the case where the results do not fully converge and one path produces significant coefficients, the variables are viewed as important predictors. For the final case, plausibility will be the divining rod that guides the effort to provide an understanding and explanation of the impact of various policies and endogenous and exogenous factors on the budgetary process.

Anticipated Conclusions

An examination of the state budgetary process will reveal:

- A tradeoff relationship exists between appropriations for corrections and appropriations for higher education.

- Exogenous factors create policy relevant conditions that impact budgetary allocations. Specifically, (1) an increasing violent crime rate leads to increased appropriations for corrections; (2) increases in the size of the 18-24 year old cohort leads to increased appropriations for corrections and higher education; (3) the presence of a Republican governor leads to increased appropriations for corrections; (4) increasing rates of unemployment lead to increases in the amount appropriated for corrections and a decrease in the amount appropriated for higher education; and (5) rising enrollment leads to increases in appropriations for higher education.
- An expanding budgetary pie leads to increases in appropriations for both discretionary budgetary categories (corrections and higher education).
- The implementation of specific public policies has the most impact on changing budgetary priorities. Therefore, policies that are negotiated and implemented outside of the formal budgetary process are most instrumental in causing changes in state government appropriations.

CHAPTER 4

In order to test the various budgetary hypotheses and to examine the tractability of the research program as outlined in the proceeding chapter, California is utilized as a case study. This chapter investigates the appropriateness of two stage least squares, seemingly unrelated regression, and issues of model selection. In order to accomplish such a task, an overview of policy changes to corrections and a brief review of the contextual background in California are necessary. This is followed by an extensive look into the various methodological issues outlined above.

California – Policies

California has a long tradition of indeterminate sentencing dating back to 1917, when laws were enacted granting discretion to the parole board (Adult Authority) and the Women's Board of Terms and Parole (Shane-Dubow, Brown, and Olsen, 33). Under this system, judges sentenced offenders to very broad terms prescribed by law, which were typically zero to life or five years to life in prison (Griset 1991, 47). Thus, the parole board was the ultimate arbiter in deciding when offenders were deemed rehabilitated and hence when they should be released. Pamela Griset states that the parole authority had "unfettered discretion in determining sentence length" (47). The practice of indeterminacy was radically altered by a series of reforms that occurred in the mid to late 1970s.

In 1976 the Determinate Sentencing Bill (SB 42) was passed and became effective on July 1, 1977. The Determinate Sentencing Bill represented a radical

departure from early sentencing practices. The bill stated that “[t]he sole purpose of the goals of the sentencing system should be the elimination of sentencing disparity and the promotion of sentence uniformity” (Shane-Dubow, Brown, and Olsen, 33). The bill effectively curtailed judicial discretion through the establishment of a narrow range of prison terms set by the legislature. For each felony offense category A through D, three sentences were established, a lower term, a middle term, and an upper term (see Table 4.1). According to the 1977 law, the court had to impose the middle term (presumptive) unless there were aggravating or mitigating circumstances that might lead to the lower term or the upper term being selected. Thus, a triad of sentencing choices was established, with egregious conduct receiving the upper term, mitigating cases the lower term, and average cases the middle term (Shane-Dubow, Brown, Olsen, 35). In addition, enhancements from one to three years could be added to the base. Enhancements pertained to either specific factors relating to the offense such as weapon use or the infliction of great bodily harm or general factors relating to prior record and offenses causing great property losses (34). For example, committing an offense while armed with or use of a weapon would lead to the addition of one or two years (Ku 1980, 4). Furthermore, the bill provided for good time credits up to three months for good institutional behavior and another month for participation in prison programs (Cohen and Tonry 1983, 357). Good time could be lost only for serious misconduct (Griset 1991, 57). Finally, SB 42 eliminated the Adult Authority and the Women’s Board of Terms and replaced it with the Community Release Board that was responsible for the revocation of parole, the review of lengths and conditions of parole, and the denial of good time (Shane-Dubow, Brown, and Olsen, 33).

Table 4.1: California Determinate Sentencing terms (SB 42)

Offense Category	Lower Term	Middle Term	Upper Term
A (e.g., murder second degree, rape with force of violence)	5 years	6 years	7 years
B (e.g., robbery first degree, burglary, rape)	3 years	4 years	5 years
C (e.g., robbery second degree, arson, assault with deadly weapon)	2 years	3 years	4 years
D (e.g., burglary second degree, forgery, auto theft)	16 months	2 years	3 years

SB 42 was immediately amended in 1978 by SB 709 that became effective January 1979. The bill focused on increasing middle and upper terms for violent felonies. Murder in the second degree was increased from 5, 6, 7 years to 5, 7, 11 years; rape was increased from 3, 4, 5 years to 3, 6, 8 years; robbery in the second degree was increased from 2, 3, 4 years to 2, 3, 5 years; and burglary in the second degree was increased from 16 mos., 2, 3 years to 2, 3, 4 years (Shane-Dubow, Brown, Olsen, 36).

A second sentencing reform, the Victim's Bill of Rights that was passed in 1982 as a referendum (Proposition 8 of 1982), represented an extension of the previous system of enhancements.¹ This law required an extra five-year term for each serious felony conviction where the defendant previously stood convicted of a serious felony. Serious crimes included: armed or unarmed burglary of a residence; robbery; felonies in which

¹ Since 1977, there have been several revisions to the level of enhancements. For example, SB 13 passed in 1979 and effective January 1, 1980 required severe enhancements for sex offenders. The bill mandated a ten-year enhancement for each previous incarceration for a violent sex crime when the defendant had two or more prior incarcerations for a sex crime and the current offense was for a violent sex crime (Griset 1991, 56).

the defendant inflicted great bodily injury on a person; felonies in which the defendant used a firearm or a dangerous weapon; and the sale of drugs to minors (Griset 1991, 57). Additionally, judges were restricted in choosing probation or suspended sentences for persons who were convicted of murder, robbery, kidnapping, first-degree murder, or who intentionally inflicted bodily injury. In effect, the Victim's Bill of Rights forbade the plea bargaining of any serious felony (Feeley and Kamin, 144).

The final major sentencing reform occurred in 1994 with the passage of Three Strikes and You're Out legislation in both houses of the state Legislature and the passage of Proposition 184. The movement for this mandatory sentencing scheme for repeat felony offenders grew out of public sentiment in favor of harsher penalties for recidivistic acts following the murders of 12-year-old Polly Klaus and the daughter of Fresno photographer Mike Reynolds. The text of the Proposition 184 states "[i]t is the intent of the People of the State of California in enacting this measure to ensure longer prison sentences and greater punishment for those who commit a felony and have been previously convicted of serious and/or violent felony offenses." The law states that if a person has one previous serious or violent felony conviction, the mandatory sentence for a new felony conviction (not just violent or serious) is twice the term otherwise required under law for the new conviction. If a person has two or more serious or violent felony convictions, the mandatory sentence for any new felony conviction (not just serious or violent) is life imprisonment with the minimum term being the greater of 1) three times the term otherwise required under the law for the new felony conviction; 2) 25 years; 3) the term determined by the court for the new conviction (California Criminal Law Observer). Projections evaluating the impact of Three Strikes and You're Out have

suggested that the law will lead to increased prison populations and the need to increase spending for corrections.²

The Department of Corrections estimated in 1994 that changes due to the implementation of Three Strikes and You're Out would result in additional state operating costs of about \$3 billion per year by the year 2003 and about \$6 billion annually by 2026. These amounts assume that a three strike's policy will add about 270,000 more inmates to the state's prison population than would have otherwise occurred. To accommodate this large increase in prison population, the Department of Corrections estimated that twenty-five new prisons would have to be built at a cost of over \$20 billion by 2026 (California Secretary of State's Office). Similarly, a recent study by Rand projects that corrections as a percentage of state funds (General Fund appropriations) would increase from 9% in FY 1994 to 18% in FY 2002 as a result of three strikes. The authors suggest that these increases would be offset by large decreases in the percentage of state funds for higher education, which represented 12% of state funds in FY 1994 (Greenwood et al., 84).³ Finally, a 1995 report by the California Legislative Analyst's Office states that

[w]ith the enactment of the Three Strikes legislation, the state is expected to incur unprecedented growth in its prison population. If the state is to accommodate this growth, several billion dollars of state funding will be needed to finance the construction and operation of the additional prisons

² As of July 30, 1998, 36,043 second strike offenders and 4,468 third strike offenders were convicted under the new law (Campaign for an Effective Crime Policy 1998).

³ Accompanying an increase in corrections would be an increase in the percent of state funds for K-12 education. The authors suggest that funds will increase from 36% of the state budget in FY 1994 to 46% in FY 2002. This growth would be driven by Proposition 98, which is written into the state constitution, and sets the minimal levels for K-12 (Greenwood et al., 84). Propositions 98 and 11 define a minimum funding level for K-14 education depending on enrollments, growth in personal income, and prior-year spending. They also require that state support for K-14 education be at least enough to achieve the specified minimum funding level when added to K-14's local property tax revenues (Carroll and Bryton 1996). Additionally, it is projected that health and welfare spending would remain relatively constant since it is tied to federal aid requirements (Greenwood et al., 84).

... the state's costs for expanding and operating its prison system will require an increasing share of the state's budget (Nicol 1996).

California – Prison Population

Between 1971 and 1997 California's prison population grew dramatically from 17,474 prisoners to 157,547 prisoners. Over this same time period the incarceration rate per 100,000 inhabitants grew from 87.4 to 475. However, an examination of Figure 4.1 reveals that up until 1979 the population remained fairly constant hovering around 20,000 prisoners. It was not until roughly 1980 that California experienced its meteoric rise in prison population, with a rate of change of 541% between 1980 and 1997. As discussed

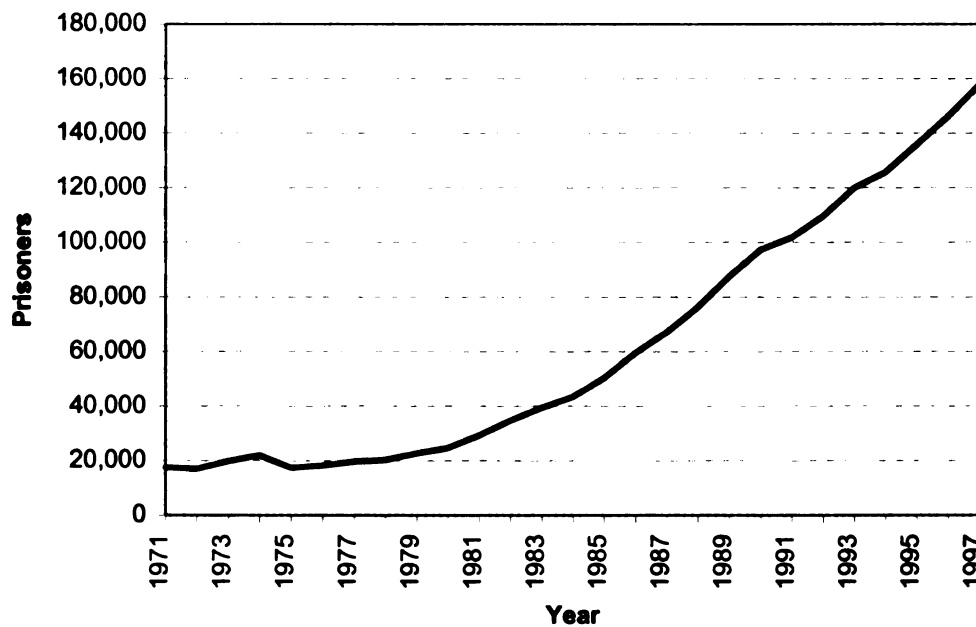


Figure 4.1: Number of Prisoners Under State Jurisdiction in California: 1971-1997

earlier, California dealt with this rapid increase by building 21 new prisons and adding 25,864 new employees to the Department of Corrections between 1984 and 1997 (Ambrosio and Schiraldi 1997). Even this increase in resources was not enough to deal

with the growth. In 1995, California operated 29 prisons and operated at 182 percent of capacity (Edwards, 480).

California – *Independent Variable – Governors*

During the period of study California had five governors, three of whom were Republicans. Between 1970 and 1975, Ronald Reagan, a Republican was governor. The next governor was the Democrat Edmund G. Brown, who held office between 1975 and 1983. Two successive Republican governors succeeded Governor Brown. These were George Deukmejian (1983-1991) and Pete Wilson (1991-1999). Finally, the Democrat Gray Davis held office between 1999 through the present. As such, it can be seen that California had a Republican governor during 21 years of the time under study.

California – *Independent Variable – Unemployment Rate*

During the time period under study the rate of unemployment in California was very volatile, fluctuating between a rate of 5 percent and 10 percent. The peak years of unemployment occurred in 1971 (8.8), 1975 (9.9), 1982 (9.9), and 1993 (9.4). As can be seen in Figure 4.2 the rate of unemployment is very cyclical, with sharp upswings followed by periods of sharp decline. The periods of growing unemployment occurred between 1973 and 1975; 1979 and 1982; 1989 and 1993. It is during these periods of rising unemployment that California faced fiscal pressure on their budgets. For example, surging state economies in the 1980's were followed by large state budget deficits. In 1991 California had a budget deficit of 6 billion dollars and between 1990 and 1994 California lost 868,000 jobs. It is hypothesized that rising unemployment rates will lead

to decreases in appropriations for higher education and increases in appropriations for corrections.

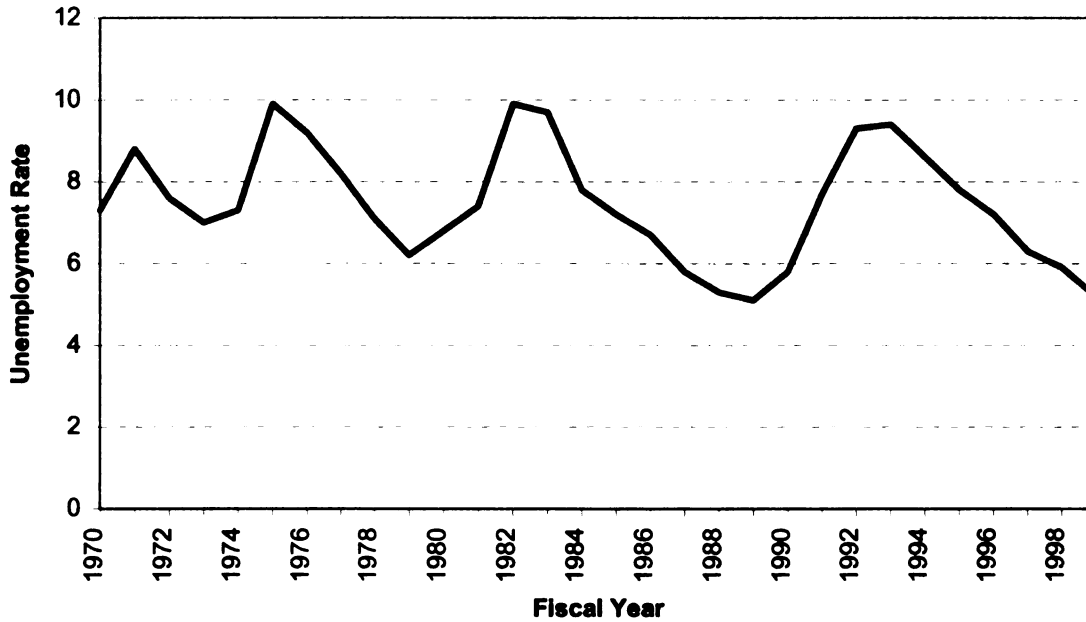


Figure 4.2: State of California: Unemployment Rate, FY 1970-1999

California – Independent Variable – Violent Crime Rate

The violent crime rate in California rose steadily between 1970 and 1980. During this period of time the rate of violent offenses known to police per 100,000 inhabitants increased from 475 in 1970 to 894 in 1980 (see Figure 4.3). Between 1980 and 1984 the violent crime rate declined to 763 only to increase again through the mid 1990's. In 1992, the violent crime rate reached its peak at 1,120 only to begin a rapid decline in the late 1990's to a rate of 627 in 1999. The decline in the latter half of the 1990's mirrors nationwide trends in the decline of the crime rate.

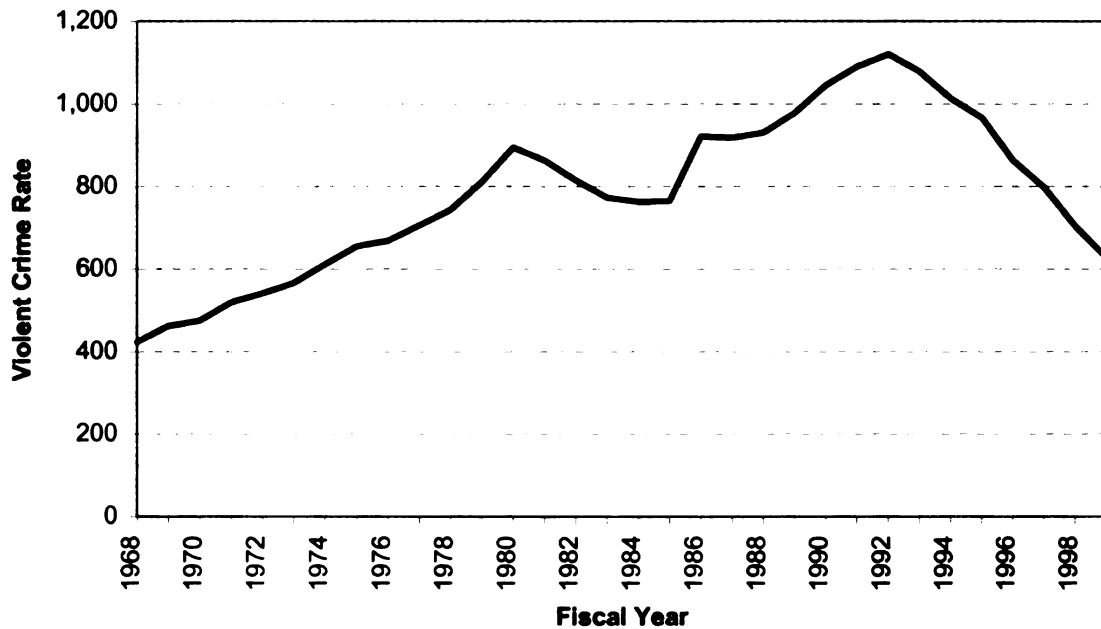


Figure 4.3: State of California: Violent Crime Rate (Part I offenses known to police per 100,000 inhabitants), FY 1968-1999

California – Independent Variable – Cohort

The size of the 18-24 year old cohort has increased from approximately 2.1 million individuals in 1968 to over 3.3 million individuals in 1999 (see Figure 4.4). The increase in this cohort gradually inclined between 1968 and 1990, increasing by 62 percent over this time period. Between 1990 and 1996 the size of this cohort dropped below 3 million, only to increase to 3.3 million in 1999.

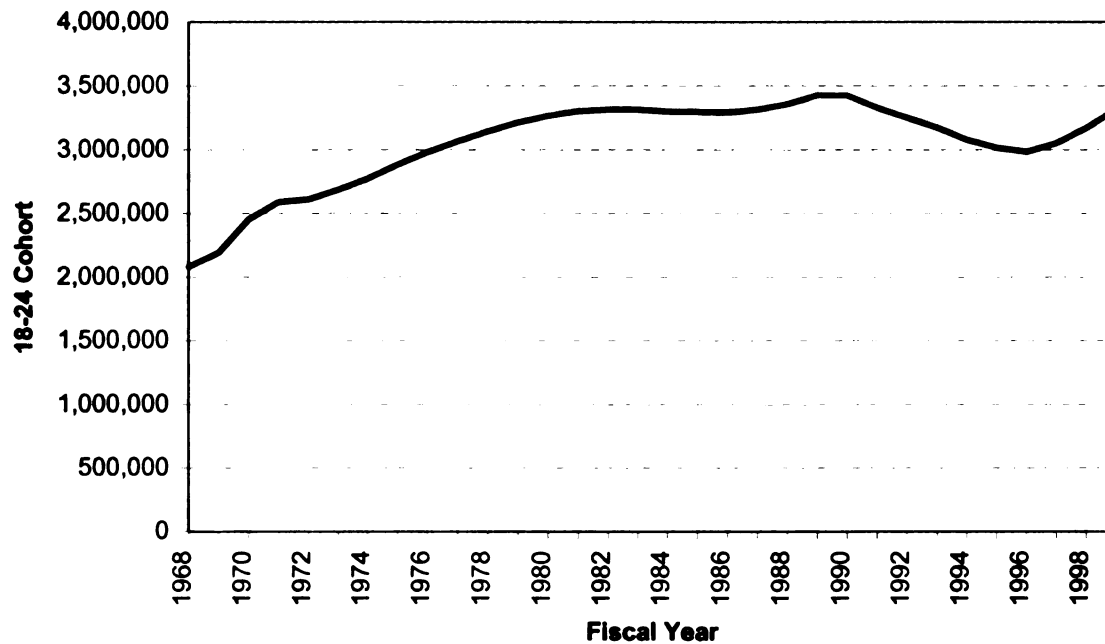


Figure 4.4: State of California: 18-24 year old cohort, FY 1968-1999

California – Independent Variable – Enrollment

Enrollment in the California system of higher education grew roughly 25 percent between 1970 and 1999. Fall enrollment in public 4-year institutions of higher education increased significantly between 1970 (429,397 students) and 1975 (516,096), only to decline through the late 1970's. By 1990, enrollment grew to over 536,000 students, followed by a period of decline in the early 1990's to a low of roughly 490,000 students in 1995. Finally, in the latter part of the 1990's enrollment once again rose to a high of 537,357 students in 1999. As such, the enrollment series is characterized by periods of growth and decay, but overall there is an upward trend in enrollment in 4-year public institutions of higher education in California.

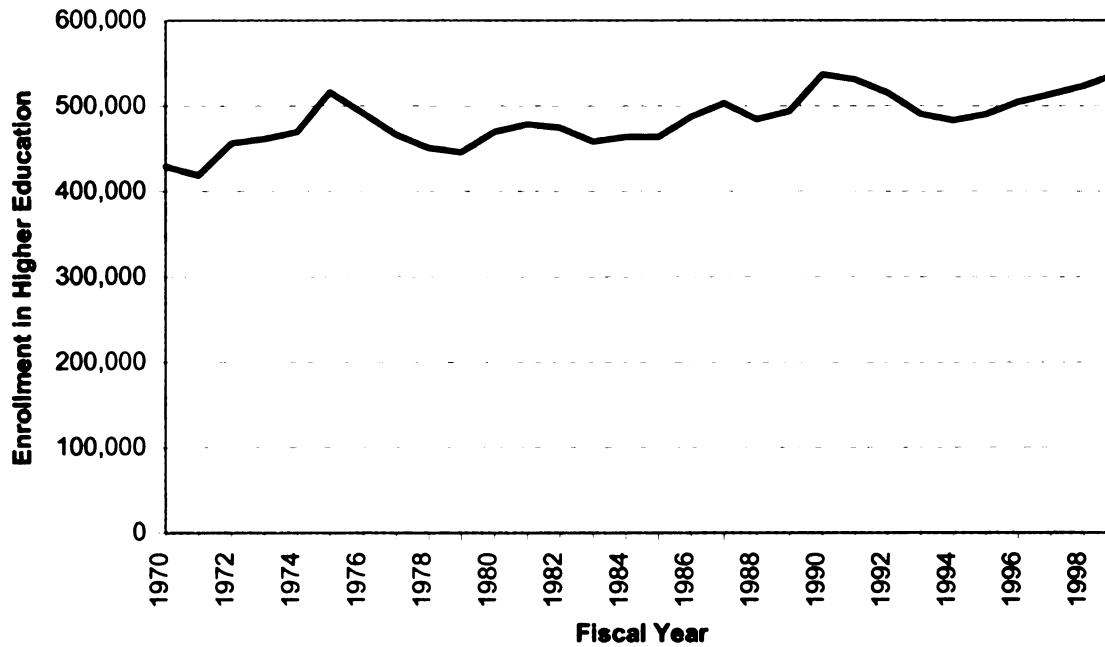


Figure 4.5: State of California: Enrollment in Higher Education, FY 1970-1999

California – Correlation Matrix

In order to assess the strength of bivariate relationships and to diagnose the possibility of collinearity, which could lead to a biased estimation of the effects of the independent variables on appropriations for higher education and corrections, a correlation matrix is constructed.

Table 4.2: Correlation Matrix for Variables included in the Budget Model, California

	Corrections Appropriations	Higher Ed Appropriations	Budgetary Pie	Cohort (t-2)	Enroll (t-2)	Violent Crime (t-2)	Unemployment (t-2)
Corrections Appropriations	--	.922 .000	.410 .025	.486 .007	.662 .000	.781 .000	-.174 .377
Higher Ed Appropriations	.922 .000	--	.512 .004	.688 .000	.582 .001	.791 .000	-.261 .179
Budgetary Pie	.410 .025	.512 .004	--	.146 .441	.009 .963	.140 .460	.236 .227
Cohort (t-2)	.486 .007	.688 .000	.146 .441	--	.496 .005	.779 .000	-.265 .156
Enroll (t-2)	.662 .000	.582 .001	.009 .963	.496 .005	--	.516 .003	-.231 .220
Violent Crime (t-2)	.781 .000	.791 .000	.140 .460	.779 .000	.516 .003	--	-.045 .814
Unemployment (t-2)	-.174 .377	-.261 .032	.236 .227	-.265 .156	-.231 .220	-.045 .814	--

Note: Pearson correlation statistic followed by significance level

The results shown in Table 4.2 illustrate that all of the continuous independent variables are significantly correlated and correlated in the hypothesized direction with appropriations for corrections and appropriations for higher education, except for unemployment with corrections which is not significant and correlated in a direction that is opposite of the hypothesized relationship. For example, appropriations for corrections is positively correlated with the size of the budgetary pie, the size of the 18-24 year old cohort, and the violent crime rate. Furthermore, appropriations for higher education is positively correlated with the size of the budgetary pie, enrollment, and negatively correlated with the unemployment rate. These results are in line with previous theoretical

expectations. However, for estimation purposes the issue of multicollinearity must be addressed.

Multicollinearity is a term that refers to correlation among the independent variables in a multiple regression model. In the presence of multicollinearity, the measured variables are too intercorrelated to allow precise analysis of their individual effect (Greene 418). Estimation in the presence of multicollinearity leads to regression coefficients that possess large standard errors in relation to the coefficients themselves, implying that the coefficients cannot be estimated with much precision or accuracy. Nevertheless, the coefficients remain unbiased and efficient. One preliminary method to check for any potential problem is to examine the correlation coefficient between independent variables. Large correlations may indicate the presence of a potential problem.⁴ In the matrix above, high levels of correlation (> 0.70) are found between appropriations for corrections and appropriations for higher education, the lag of the violent crime rate and appropriations for corrections, the lag of the violent crime rate and appropriations for higher education, and the lag of the violent crime rate and the lag of the size of the 18-24 cohort. Further insights into multicollinearity will be conducted at the estimation phase by examining collinearity diagnostics.

California – *Two Stage Least Squares*

Utilizing the data from California, I initially estimate a system of simultaneous equation models to test the various hypotheses. As discussed earlier in this dissertation, estimation is conducted for the data in levels and in differences. Differences are taken to

⁴ Belsley, Kuh, and Welsch (1980) suggest that utilizing a correlation matrix is insufficient for detecting multicollinearity. They argue that correlation matrices are incapable of detecting when three or more variates are collinear while it is possible that no two of the variates taken alone are highly correlated.

mitigate the effect of unit roots and spurious regression. Decisions regarding the appropriate transformations were made by referencing the Augmented-Dickey Fuller (ADF) test and visual inspections of the series. Table 4.3 presents the results of the ADF tests.

Table 4.3: Unit Root Tests (ADF)

	No Trend, No Intercept	Intercept, No Trend	Intercept and Trend
Corrections	3.675	2.56	-1.644
Corrections d1	-.892	-2.307	-3.734**
Corrections d2	-5.805***	-5.788***	-5.6508***
Higher Ed	-1.6348	-.0594	-3.022
Higher Ed d1	-2.056**	-3.207**	-3.1901
Higher Ed d2	-4.9913***	-4.914***	-4.829***
Cohort	.664	-2.661*	-2.94
Cohort d1	-3.34***	-3.448**	-2.193
Cohort d2	-6.097***	-4.61***	-4.804***
Violent Crime	-.366	-1.695	-.097
Violent Crime d1	-1.82*	-1.72	-2.54
Violent Crime d2	-4.7402***	-4.25***	-4.691***
Enroll	.901	-2.644*	-3.948**
Enroll d1	-4.44***	-4.504***	-4.366***
Unemployment	-1.04	-3.502**	-3.626**
Unemployment d1	-3.855***	-3.79***	-3.800**
Pie	-.8745	-2.443	-2.78
Pie d1	-4.874***	-4.877***	-4.8136***

Note: * = .10; ** = .05; *** = .01 significance level

It was determined that appropriations for corrections, appropriations for higher education, the size of the 18-24 cohort, enrollment, unemployment, and the budgetary pie all need to be first differenced to make these series $I(0)$. In addition, violent crime is differenced twice in order to induce stationarity. Furthermore, due to multicollinearity, found using collinearity diagnostics in Stata, the size of the 18-24 cohort is removed from the

corrections equation.⁵ Finally, all non-endogenous variables are lagged two time periods to more accurately reflect the impact of exogenous factors and public policies on the budgeting process. Now that issues relating to the data have been taken care of the results from the 2SLS estimation are presented.

Table 4.4 includes results of the simultaneous equation estimation for both data in levels and the transformed data. The results in levels illustrate that the coefficients associated with the violent crime rate and the political ideology of the governor are significant at the .05 level, while the implementation of determinate sentencing is significant at the .10 level.

Table 4.4: Two Stage Least Squares – Levels and Differenced, California

	Levels				Differenced			
	Corrections		Higher Ed		Corrections		Higher Ed	
	Coef	t-value	Coef	t-value	Coef	t-value	Coef	t-value
Constant	-4376.5	** -3.18	-1641.4	-0.68	-44.36	-0.42	360.53	**2.34
Corrections	--	--	0.9281	**7.71	--	--	-0.3301	-0.49
Higher Education	.4689	0.77	--	--	0.029	0.09	--	--
Pie	-0.025	-0.17	0.2483	**4.44	0.023	0.68	0.0929	**2.64
Cohort	--	--	0.0023	**5.94	--	--	-0.0006	-0.54
Enrollment	--	--	-0.004	-1.04	--	--	-0.0043	-1.36
Violent Crime	4.54	**2.64	--	--	-0.590	-1.44	--	--
Unemployment	93.207	0.56	-175.0	** -2.72	-13.27	-0.37	-87.788	-1.60
Governor	833.30	**3.23	9.993	0.04	107.0	1.86	-52.619	-0.34
Determinate Sent.	-435.43	-1.73	--	--	89.33	**3.08	--	--
Victim's Bill	-272.05	-0.24	--	--	39.55	0.32	--	--
Three Strikes	1190.4	1.20	--	--	-182.0	-1.36	--	--
R ²	0.973		0.965		0.613		0.4151	
Hausman (chi ² prob)	0.5351		0.0001		0.927		0.6096	

Note: Corrections and Higher Education in millions; ** significant at .05

⁵ After removal of the cohort variable, the condition number is below a value of 10.

All of these coefficients are in their hypothesized direction, except for the implementation of determinate sentencing. Furthermore, the coefficients of corrections, the budgetary pie, the size of the 18-24 cohort, and the unemployment rate are all significant and in the hypothesized direction for higher education. When the data is differenced, only the political ideology of the governor and the implementation of determinate sentencing are significant for corrections and the size of the budgetary pie for higher education. In the differenced model, the signs associated with the significant coefficients are in the hypothesized direction.

It is important to note that results from the 2SLS estimation show that in levels an increase in appropriations for corrections leads to increases in appropriations for higher education. However, the .92 coefficient indicates that corrections is growing at a faster rate than higher education. When the data is differenced there is no significant relationship. Before a tradeoff relationship between the two series can be ruled out it is necessary to test and see if in fact 2SLS is an appropriate methodology. As such, OLS models are estimated and these results are compared to the 2SLS estimates using the Durbin-Wu-Hausman test. This test examines whether the difference in the coefficients between the instrumented and OLS model are in fact systematic. These results are reported in Table 4.4. The test reveals that when the data is treated in levels the OLS estimates for corrections are not systematically different from the estimates produced by 2SLS. Furthermore, when the data is differenced the OLS estimates for corrections and higher education are also found not to be systematically different from the estimates derived from the simultaneous equation model. This implies that there is in fact no simultaneity bias in the OLS estimates of these equations. However, the test reveals that

in levels the higher education estimates are systematically different. Since it was found that the corrections equation does not suffer from simultaneity bias, it can be inferred that the relationship between corrections and higher education is recursive. This means that there is unidirectional dependency among the endogenous variables. Appropriations for corrections is found to be a determinate of appropriations for higher education, but appropriations for higher education is not found to be a determinate of appropriations for corrections.

The determination that there is not an explicit tradeoff between appropriations for corrections and appropriations for higher education does not rule out the possibility that the error terms of the OLS models used to estimate corrections and higher education are correlated. As such, appropriations for corrections and appropriations for higher education may be seemingly unrelated. In order to assess this possibility and to achieve more efficient estimates the technique of seemingly unrelated regressions are applied to both the transformed data and the recursive model in levels.

California – *Seemingly Unrelated Regressions*

Tables 4.5 and 4.6 show the results of the seemingly unrelated regressions. When the differenced data is utilized, the model explains 61 percent of the variance in the corrections model. In addition, diagnostic tests rule out potential problems related to autocorrelation.⁶ Coefficients associated with the size of the budgetary pie, the political ideology of the governor, the implementation of determinate sentencing and Three Strikes and You're Out are found to be significant determinates of appropriations for

⁶ At the sixth lag, the Ljung-Box Q stat is insignificant (.1173) and the Q stat generated from the Portmanteau test for white noise is insignificant (.4095). Furthermore, since SUR is a GLS procedure heteroskedasticity is not a problem.

corrections. These results imply that corrections receives on average 2.5 percent of the change in the budgetary pie, holding all other variables constant. This suggests that as the budgetary pie expands, appropriations for corrections increase. Additionally, the presence of a Republican governor in office leads to an average increase in the change in appropriations for corrections of \$104.7 million per year. This implies that Republican governors are more likely to favor ‘tough on crime’ policies and are willing to expand the criminal justice system while in office. Furthermore, the implementation of determinate sentencing leads to an average increase in the change in appropriations for corrections of approximately \$90.1 million per year, while the implementation of Three Strikes leads to a decrease in the change in appropriations for corrections of \$181 million per year.

Table 4.5: Seemingly Unrelated Regression, Corrections in California

	Differenced-Differenced		Levels-Recursive	
	Coefficient	z-value	Coefficient	z-value
Constant	-37.04567	-0.86	-3860.97	** -7.8
Pie	0.025685	**2.67	0.055123	1.65
Violent Crime	-0.595021	-1.77	6.065963	**12.2
Unemployment	-16.13311	-0.098	8.692519	0.21
Governor	104.6619	**2.55	751.3223	**4.32
Determinate Sentencing	90.11306	**3.94	-309.5103	** -2.31
Victim’s Bill of Rights	40.34203	0.68	521.6149	**2.06
Three Strikes	-181.0394	** -2.54	2769.183	**11.47
R ²	0.6093		0.9742	

Note: Corrections and Higher Education in millions; ** significant at .05

When estimation of the higher education model is performed, on the differenced data, the model is able to capture 42.6 percent of the variance (See Table 4.6). The coefficient associated with the size of the budgetary pie is significant at the .05 level and the unemployment rate is significant at the .10 level. The results imply that on average

higher education receives 8.6 percent of the change in the size of the budgetary pie and that a change in the unemployment rate of one percent leads to a decline in the size of appropriations for higher education by \$84.5 million per year.

Table 4.6: Seemingly Unrelated Regression, Higher Education in California

	Differenced-Differenced		Levels-Recursive	
	Coefficient	z-value	Coefficient	z-value
Constant	321.0487	**2.92	-1707.409	-0.86
Corrections	N/A	N/A	0.919928	**9.60
Pie	0.085865	**3.14	0.250779	**5.35
Unemployment	-84.49526	-1.82	-176.2135	**3.17
Governor	-79.28214	-0.63	21.20963	0.10
Cohort	0.000431	-0.49	0.002288	**6.96
Enrollment	-0.041318	-1.53	-0.004517	-1.21
R ²	0.4263		.9655	

Note: Corrections and Higher Education in millions; ** significant at .05

The alternative specification, using data in levels, estimates the models for corrections as a recursive system. The model for corrections is able to account for 97 percent of the variance. In addition, diagnostic tests reveal that autocorrelation is not a problem.⁷ Furthermore, coefficients associated with the violent crime rate, the political ideology of the governor, the implementation of Three Strikes, the Victim's Bill of Rights, and determinate sentencing are significant at the .05 level. The results suggest that on average an increase in the violent crime rate by one percent leads to an increase in appropriations for corrections by \$6.1 million, holding all other variables constant. In addition, the presence of a Republican governor leads to an average increase in

⁷ At the sixth lag, the Ljung-Box Q stat is insignificant (.9040) and the Q stat generated from the Portmanteau test for white noise is insignificant (.6465).

appropriations of corrections of \$751 million. Furthermore, the implementation of Three Strikes leads to an average increase in appropriations for corrections of \$2.8 billion and the implementation of the Victim's Bill of Rights leads to an average increase in appropriations for corrections of \$521 million, suggesting that the state government is responding to the demands being placed on the criminal justice system by these 'tough on crime' policies. Finally, the implementation of determinate sentencing leads to an average decrease in appropriations for corrections of \$309.5 million. The decline in appropriations associated with the implementation of determinate sentencing may be a function of shorter durations of time served by offenders. While this policy mandated specific sentences for various crimes and removed discretion, the actual time served under determinate sentencing may have been less than the time served when judges and parole boards had discretion in determining the time served by offenders.

When estimation of the higher education model is performed on the data in levels for the recursive system, 96.6 percent of the variance is captured. The coefficients associated with corrections, the budgetary pie, the unemployment rate, and the size of the 18-24 cohort are all significant at the .05 level. The results suggest that on average higher education receives 25 percent of the budgetary pie, holding all other variables constant. In addition, as appropriations for corrections increases, appropriations for higher education increase. However, a one-dollar increase in corrections is met with only a 92-cent increase for higher education. This suggests that corrections is increasing at a larger rate than higher education. Furthermore, an increase in the unemployment rate by one percent leads to an average reduction in appropriations for higher education by \$176.2 million. Finally, an increase in the size of the 18-24 population by one individual

leads to an average increase of approximately \$2,300 in appropriations for higher education.

The previous discussion has provided insights into the relationship between public policies and exogenous factors on the budgets of corrections and higher education. However, the question if there is a tradeoff between these two budgetary categories has not been resolved. Previously it was found that an explicit tradeoff could be dismissed, however, it is still possible that these budgetary categories are seemingly unrelated. Table 4.7 presents the results of the Breusch-Pagan test. The results show that for estimation of the differenced data the errors are not related, suggesting that there is no tradeoff between corrections and higher education. In contrast, the test results from the series in levels suggest that the errors of the two series are correlated at a value of -0.07. While this suggests that they are seemingly unrelated, the relationship is not significant. As such it can be inferred that there is in fact no tradeoff relationship between appropriations for corrections and appropriations for higher education in California between 1970 and 1999. In fact the results from estimation of the recursive model show that increases in appropriations lead to almost equivalent increases in appropriations for higher education. These finding confirm Domke, Eichenberg, and Kelleher's (1983) assertion "that direct priority setting – the trading off of one program against the other – is rare or nonexistent in democratic governments" (20).

Table 4.7: Seemingly Unrelated Results (Breusch-Pagan Test), California

	Correlation	Chi-square	Probability
Differenced-Differenced	0.0826	0.184	0.6676
Levels-Recursive	-0.0702	0.138	0.7102

This chapter has presented a framework within which to test the hypotheses laid out in Chapter 2. Estimation was conducted for transformed data and for data in levels. A comparison of the results generated from the two paths can be seen in Figure 4.8. This figure shows the sign and the p-value (in parentheses) of those coefficients that were found to be significant for corrections and higher education. When both paths produce significant coefficients with the same sign, the results have converged. Convergence occurs for the size of the budgetary pie and the partisan ideology of the governor for corrections and the budgetary pie and the unemployment rate for higher education. In addition, only one of the paths for corrections produces significant coefficients for the implementation of the Victim's Bill of Rights. For higher education, only one of the paths produces significant coefficients for corrections, the size of the cohort, and enrollment. Finally, the signs of the coefficients associated with the violent crime rate, the implementation of determinate sentencing, and Three Strikes and You're Out are in conflict with one another. In order to understand these results, the findings will be directly related to the statistical hypotheses.

Table 4.8: Triangulation of Estimates in California

Corrections	Difference – Difference	Levels-Recursive
Pie	+ (.008)	+ (.100)
Violent Crime	- (.077)	+ (.000)
Unemployment		
Governor	+ (.011)	+ (.000)
Determinate Sentencing	+ (.000)	- (.021)
Victim's Bill of Rights		+ (.039)
Three Strikes	- (.011)	+ (.000)

Table 4.8 (continued): Triangulation of Estimates in California

Higher Education	Difference – Difference	Levels-Recursive
Corrections		+ (.000)
Pie	+ (.002)	+ (.000)
Unemployment	- (.068)	- (.002)
Governor		
Cohort		+ (.000)
Enrollment	- (.125)	

Note: +/- symbols are the signs of coefficients and p-values are in parenthesis ($\leq .125$).

The results in California reveal: (1) that there is not a tradeoff relationship between corrections and higher education appropriations. Instead the relationship is recursive with higher education growing at a slower rate than corrections. (2) Exogenous factors create policy relevant conditions that impact budgetary allocations. Specifically, the presence of a Republican governor leads to increased appropriations for corrections. Additionally, an increasing violent crime rate leads to a growing demand for corrections resources and thus increased appropriations for corrections. Finally, appropriations for higher education increase as the unemployment rate declines and as the size of the 18-24 year old cohort increases. (3) An expanding budgetary pie leads to increases in appropriations for both corrections and higher education. (4) The implementation of specific public policies is instrumental in causing changes in state government appropriations. The implementation of the Victim's Bill of Rights leads to an increase in appropriations for corrections. Furthermore, the results surrounding the implementation of determinate sentencing and Three Strike's and You're Out are mixed. The more plausible of the two results is that the implementation of determinate sentencing actually led to shorter lengths of time served and decreased appropriations and the longer

sentences associated with the implementation of Three Strikes led to increased appropriations for corrections.

To gain further insights into the relative impact of these factors on appropriations, predicted values are generated for the data in levels. The table that follows (Table 4.9) shows the estimated coefficients for the constant term and the independent variables for corrections. In addition, the predicted values associated with each fiscal year are generated by multiplying the coefficients by the value of the corresponding independent variable in billions of dollars. Calculating predicted values allows for an inspection into the relative contribution that each factor has on the amount appropriated. For example, in FY 1972 the coefficient for the violent crime rate is \$.006 billion and the violent crime rate itself is 474, resulting in 2.8 billion dollars ($.006 \times 474$) appropriated for corrections. Finally, the predicted appropriations for corrections for each fiscal year are shown as well as the actual amount appropriated.

Table 4.9 shows the predicted values generated for corrections in levels. The constant term suggests that absent any other influence corrections would receive $-\$3.9$ billion. Two factors play a large role in offsetting the negative coefficient. These are the violent crime rate and the implementation of Three Strikes. The growing violent crime rate in the 1970's led to an increased demand for correctional resources. This demand was met with greater resource allocation in the form of increased appropriations for corrections. This can be seen in the predicted values for corrections attributable to the violent crime rate, which increased from \$2.9 billion in 1972 to \$5.4 billion in 1982. Following a short period of decline the appropriations attributable to violent crime rose to a high of \$6.8 billion in 1994. In the latter half of the 1990's the violent crime rate in

California and the rest of the nation declined. This meant that there was less of a demand being placed on the correctional system and appropriations attributable to the violent crime rate declined to \$4.8 billion in 1999. In conjunction, one would expect overall appropriations for corrections to decline. However, appropriations for corrections continued to rise in the late 1990's. This increase was a function of the implementation of Three Strikes and You're Out.

The implementation of Three Strikes dramatically influenced the amount of monies appropriated for corrections. This 'tough on crime' policy was implemented at roughly the same time that the violent crime rate began to decline. Three Strikes necessitated that additional resources be allocated to corrections. Appropriations attributable to Three Strikes measured \$1.4 billion in 1997, \$2.1 billion in 1998, and \$2.8 billion in 1999.⁸ Thus, despite a decline in the violent crime rate, appropriations for corrections continued to rise primarily due to 'tough on crime' policies. Furthermore, it is interesting to note that if the violent crime rate had not declined in the late 1990's the amount appropriated for corrections would have significantly increased. For example, if the number of violent offenses known to police per 100,000 inhabitants in 1996 and 1997 had been roughly the same rate as the early 1990's (1,000), the amount appropriated for corrections would have risen from current predicted value of \$4.5 billion to \$5.3 billion in 1998 and \$4.7 billion to \$6.0 billion in 1999, *ceteris paribus*. Such a large increase would have most likely placed a tremendous fiscal strain on the state of California. The

⁸ The dummy variable used for Three Strikes is coded as .5 in 1997, .75 in 1998, and 1 in 1999. This weighting system is utilized to more accurately capture the implementation process of this policy. Many offenders being tried after the implementation of this policy in the first two years were in fact not eligible to be sentenced under its' guidelines. This is because many offenders were arrested prior to its implementation, but due to the lengthy amount of time associated with trials and criminal processing they were not sentenced until afterwards.

state may have had to respond by increasing taxes or funding corrections at the expense of other programs. This implies that California presently finds itself in a very tenuous place. If the violent crime rate were to increase in the coming years the growing demand for additional resources for corrections might lead to a statewide fiscal crisis.

Table 4.9: Predicted Values for Appropriations for Corrections (in billions)

FY	Constant	Budgetary Plc	Governor	Unemployment Rate	Violent Crime	Determinate Sentencing	Victim's Bill	Three Strikes	Corrections Predicted	Corrections Actual
1972	-3.861	0.055	0.751	0.009	0.006	-0.310	0.522	2.769	-0.136	0.208
1973	-3.861	0.035	0.751	0.063	2.875	0.000	0.000	0.000	0.206	0.237
1974	-3.861	0.097	0.751	0.076	3.142	0.000	0.000	0.000	0.291	0.278
1975	-3.861	0.059	0.751	0.066	3.276	0.000	0.000	0.000	0.441	0.309
1976	-3.861	0.063	0.751	0.061	3.427	0.000	0.000	0.000	0.704	0.337
1977	-3.861	0.050	0.751	0.063	3.700	0.000	0.000	0.000	0.267	0.378
1978	-3.861	0.068	0.000	0.086	3.973	0.000	0.000	0.000	0.526	0.432
1979	-3.861	0.249	0.000	0.080	4.058	0.000	0.000	0.000	0.298	0.520
1980	-3.861	0.121	0.000	0.071	4.277	-0.310	0.000	0.000	0.540	0.600
1981	-3.861	0.148	0.000	0.062	4.501	-0.310	0.000	0.000	0.528	0.709
1982	-3.861	0.035	0.000	0.054	4.919	-0.619	0.000	0.000	1.000	0.725
1983	-3.861	0.004	0.000	0.059	5.417	-0.619	0.000	0.000	0.875	0.846
1984	-3.861	0.062	0.000	0.064	5.229	-0.619	0.522	0.000	1.222	1.046
1985	-3.861	0.157	0.000	0.086	4.938	-0.619	0.522	0.000	1.729	1.373
1986	-3.861	0.169	0.751	0.084	4.683	-0.619	0.522	0.000	1.637	1.645
1987	-3.861	0.148	0.751	0.068	4.628	-0.619	0.522	0.000	1.596	1.879
1988	-3.861	0.100	0.751	0.063	4.640	-0.619	0.522	0.000	2.592	2.027
1989	-3.861	0.160	0.751	0.058	5.581	-0.619	0.522	0.000	2.584	2.451
1990	-3.861	0.178	0.751	0.050	5.562	-0.619	0.522	0.000	2.511	2.667
1991	-3.861	0.037	0.751	0.046	5.635	-0.619	0.522	0.000	2.942	3.049
1992	-3.861	0.178	0.751	0.044	5.926	-0.619	0.522	0.000	3.046	3.033
1993	-3.861	-0.137	0.751	0.050	6.339	-0.619	0.522	0.000	3.363	3.383
1994	-3.861	-0.103	0.751	0.067	6.606	-0.619	0.522	0.000	3.827	3.625
1995	-3.861	0.165	0.751	0.081	6.788	-0.619	0.522	0.000	3.597	3.946
1996	-3.861	0.190	0.751	0.082	6.533	-0.619	0.522	0.000	3.207	3.799
1997	-3.861	0.200	0.751	0.075	6.139	-0.619	0.522	0.000	4.312	4.128
1998	-3.861	0.207	0.751	0.068	5.860	-0.619	0.522	1.385	4.481	4.557
1999	-3.861	0.319	0.751	0.063	5.229	-0.619	0.522	2.077	4.742	4.739
	-3.861	0.284	0.751	0.055	4.841	-0.619	0.522	2.769		

CHAPTER 5

The second state examined in this dissertation is Michigan. Michigan experienced several policy reforms between 1970 and 1999 that shifted the nature of sentencing from indeterminacy to determinacy. Reforms included the implementation of mandatory minimums for firearms and drugs, truth in sentencing, sentencing guidelines, and the elimination of good time for certain offenses. This chapter proceeds by providing an overview of these policy changes and a brief review of societal conditions in Michigan during the period of study. This includes a look at the prison population, the unemployment rate, the violent crime rate, size of the 18-24 cohort, and enrollment in 4-year public institutes of higher learning. This contextual overview is followed by the estimation of models for corrections and higher education appropriations. The various budgetary hypotheses in this dissertation will be tested using the estimation strategy laid out in Chapter 3.

Michigan – *Policies*

Until 1977, sentencing in Michigan was almost exclusively indeterminate in nature and operated under a structure where each sentence carried a minimum and maximum term (set by penal statute) with the exact date of release at the discretion of the parole board. Following years of broad judicial and parole board discretion, Michigan enacted a series of reforms that represented a shift towards determinate sentencing. The reforms included the introduction of mandatory minimum sentences, sentencing guidelines, truth in sentencing, and alterations to prison release mechanisms.

The first major reform, M.C.A.A., Sec 750.227 (Michigan Felony Firearm Statute), adopted in 1976 and effective January 1, 1977, mandated a two-year prison term for any person convicted of possession of a firearm during the commission of a felony.¹ This term could not be suspended or shortened by release on parole (Cohen and Tonry 1983). A second conviction mandated a five-year term and a third conviction a ten-year term. These sentences were to be served prior to serving their sentence on the underlying offense.²

The second major reform was established via statewide referendum in 1978 (Ballot Proposal B). This law mandated that prisoners convicted of any of a long list of offenses must serve the minimum sentence imposed by the court. The offenses included: arson related crimes, various types of assaults, breaking and entering, firearm offenses, forms of criminal sexual conduct, and armed and unarmed robbery (Shane-Dubow, Brown, and Olsen, 153). Thus, the minimum sentence could not be reduced by good time or special parole. A report prepared by the Michigan House Fiscal Agency suggests that Proposal B served to increase average sentences for these offenses by 1.8 years (Gregory p. 6). Proposal B was subsequently amended in 1982 by Public Acts 442 and 458. These acts allowed prisoners, who were no longer eligible for good time, to receive a five-day per month reduction in their sentence as disciplinary credits and an additional two days per month from a prisoner's disciplinary committee. Under the new system, the first five days were awarded automatically, unless a prisoner misbehaved, and the second two days were at the discretion of prison officials. In total, prisoners could have had their

¹ Tonry (1987) recounts that one Michigan prosecutor promised on billboards and bumper stickers that "One With a Gun Gets You Two" (25).

² A similar law in Massachusetts, the Bartley-Fox Gun Law (1975) mandates a one-year prison sentence for the first conviction, a five-year sentence for the second conviction, and seven years for the third. However, unlike in Michigan, offenders may be paroled.

sentences reduced by up to 84 days per year. Finally, in 1984, good time credits, which automatically granted credits ranging from five to 22 ½ days per month depending on the length of sentence, were removed and the entire inmate population was placed under the disciplinary credit structure, at a lower and flat rate. Gregory suggests that “this measure had the effect of adding an additional 500 prisoners to the annual population count” (6).

The third reform, the “650 Lifer Law,” was also established in 1978. This law mandated life without parole for possession of 650 or more grams of cocaine or heroin. The law was aimed at large drug dealers and represents a ‘one-strike and you’re out’ policy. As of 1998 there were approximately 220 offenders in Michigan prisons serving life terms under this law, a majority of who can be viewed as nonviolent. Prisoners sentenced to life represent a fixed cost for the Department of Corrections since they are not eligible for parole and will continue to fill beds and impact costs of operation.³

A fourth reform was the passage of Public Act 519 of 1980 (signed into effect on January 21, 1981), which established the Prison Overcrowding Emergency Powers Act (EPA). The EPA gave the governor the power to reduce the sentences of all prisoners (except life and gun sentences) by ninety days every time the states’ prisons and correctional camps were overcrowded for thirty days in a row and all other administrative remedies had been exhausted. This mechanism acted to accelerate the parole process by reducing a prisoner’s earliest parole eligibility and was seen as a short-term solution for dealing with the problem of prison overcrowding associated with the ‘crisis in corrections’ (Gregory, 7). The EPA was employed nine times between its inception and 1984 (once in 1981; three times in 1982; twice in 1983; and three times in 1984) and

³ In July of 1998, Michigan passed bills changing the “650 lifer” law to “life or any term of years, not less than 20” and allowing parole for current 650 lifers who had already served twenty years.

benefited an estimated 10,000 inmates and served to reduce many sentences by as much as 810 days. However, the use of this mechanism as a 'safety-valve' for overcrowding did not endure.

On October 25, 1984 two people were murdered in the Lansing area (one of the victims was an East Lansing police officer). The murders were committed by a male parole violator and a female halfway house escapee. The male had benefited from previous enactments of the EPA and soon thereafter the release mechanism came under intense scrutiny.⁴ As a result, in September of 1984, Governor James Blanchard refused to invoke the EPA to help alleviate prison overcrowding and since then the mechanism has not been utilized again. The decision to not employ the EPA arose at the same time that Michigan faced a 1984 court consent decree that grew out of action brought against the state by the United States Department of Justice. The consent decree stipulated that medical, sanitation, fire safety, and overcrowding conditions be rectified in Michigan's prisons. The decree declared that inmates were required to have at least 60 square feet in the dormitories as their own (Gregory, 6). The implication that follows is that Michigan had to either build additional capacity or release some offenders. Despite an obvious incentive to continue using the EPA, the State of Michigan chose to build new prisons. Warren Gregory states that Blanchard's decision implied that "the state would expand capacity; it would build its way out of the crisis" (Gregory, 8). Thus, between January 1985 and December 1991, the State of Michigan undertook a six-year prison construction

⁴ For example, between the period of September 22 – 25, 1985 the *Detroit Free Press* ran a series entitled "Revolving Door Prisons" that highlighted the early release of prisoners and the subsequent offenses these early released offenders committed. In response to the increased criticisms, the Michigan House of Representatives Correction's Committee released a report entitled the *Report of the House Standing Committee on Corrections Investigation of Michigan Department of Corrections Release Policies and Practices* (1985). Among other things, the report focused on the use of the EPA, good time credits, and disciplinary credits.

program that was estimated to cost over \$800 million. The project increased state prison capacities from 12,930 to 31,548 beds (Gregory, 1).

The final sentencing reforms in Michigan have occurred in the late 1990's. In 1998 Michigan implemented truth in sentencing (created in 1994) for assaultive offenses committed on or after December 15, 1998. This was later expanded to include all felonies beginning on December 15, 2000. These provisions eliminated disciplinary credits for violent and assaultive crimes and ended the practice of the placement of offenders in community corrections programs. The National Council on Crime and Delinquency expects these changes to add 5,400 more offenders to the state prison system by 2007 (Michigan Department of Corrections, 47). Additionally, Public Act 317, enacted on January 1, 1999, established a set of sentencing guidelines that covered all felonies and replaced guidelines imposed by the Michigan Supreme Court in 1988. This was the fulfillment of an effort to create and implement sentencing guidelines that began in 1979.

Michigan – Prison Population

Over the time period of study, Michigan has dramatically increased its prison population. Between 1979 and 1999, Michigan's prison population has increased by 230% from 13,330 to 44,191 inmates. As can be seen in Figure 5.1, the total number of prisoners under state jurisdiction in Michigan remained relatively stable between 1971 and 1974 with a population hovering below 10,000 prisoners. Between 1975 and 1978 there was an increase in the number of prisoners to about 15,000. This remained relatively stable until 1985 when Michigan saw a dramatic and continuous increase in its

prison population, towards 45,000 prisoners.⁵ In addition to growth in the number of prisoners, Michigan's incarceration rate per 100,000 inhabitants grew from 106.4 in 1971, to 440 in 1997. During this same time period, appropriations for corrections began to increase and the percentage of the state budget designated for corrections began to increase.

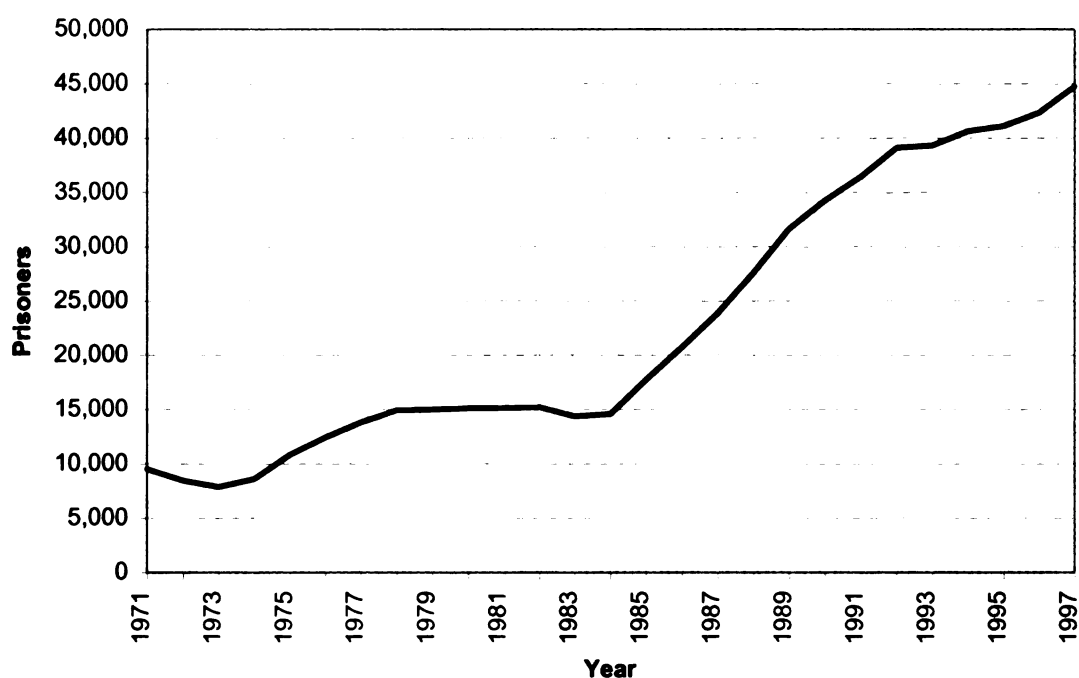


Figure 5.1: Number of Prisoners Under State Jurisdiction in Michigan: 1971-1997

Michigan – Independent Variable – Governors

During the period of study Michigan had three governors. The first governor, William G. Milliken, a Republican, held office between 1969 and 1983. Governor

⁵ In addition to building new prisons to meet increases in the state's prison population, Michigan made arrangements to transfer approximately 1,500 prisoners to prisons in the state of Virginia in the mid 1990's. Virginia had a surplus of prison beds following a massive prison construction project implemented under the auspices of Governor George Allen in 1995.

Milliken was followed in office by a Democrat, James J. Blanchard. Governor Blanchard held office from 1983 to 1991. Finally, Governor John M. Engler, a Republican, held office from 1991 to the present. Thus, Republicans held the office of governor in Michigan for all but eight years of the time under investigation.

Michigan – *Independent Variable – Unemployment Rate*

Between 1970 and 1999 the unemployment rate in Michigan fluctuated dramatically between 3 and 15 percent. These lows and highs reflect fiscal good times and fiscal bad times for the state of Michigan. In the mid 1970's and the early 1980's Michigan experienced periods of extreme unemployment. Between 1973 and 1975 the unemployment rate rose from 5.9 to 12.5 and between 1978 and 1982 it rose from 6.9 to a high of 15.5. In 1982 the unemployment rate in California (9.9) and the nation as a whole (9.7) were significantly lower than that found in Michigan. Following the fiscal crisis in the early 1980's in Michigan, the unemployment rate declined to 7.1 in 1989 only to increase again to 9.3 in 1991. The remainder of the 1990's was characterized by a steady decline to a low of 3.8 in 1999.

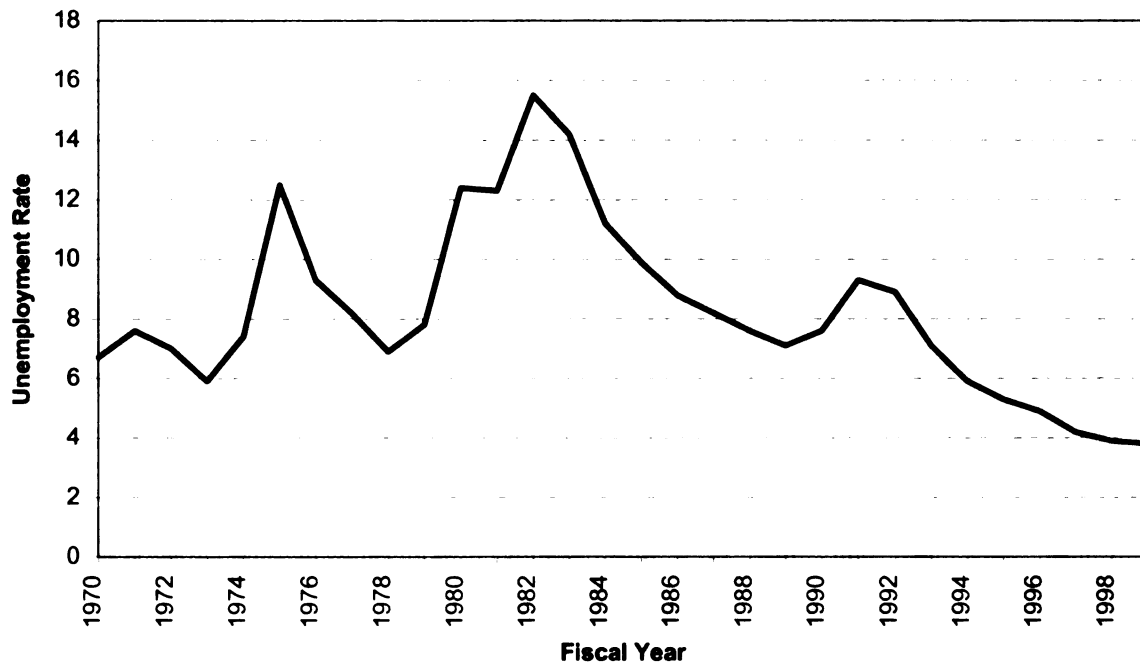


Figure 5.2: State of Michigan: Unemployment Rate, FY 1970-1999

Michigan – Independent Variable – Violent Crime Rate

Similar to California, the violent crime rate in Michigan rose between 1970 and the early 1990's. However, the increase in Michigan was not as steady in the mid 1970's. In Michigan the violent crime rate rose to a rate of 686 in 1975 only to decline to 577 in 1979. Between 1979 and 1986 the rate of violent offenses known to police per 100,000 inhabitants increased fairly steadily to a rate that exceeded 800. While not as dramatic an increase as in California, the violent crime rate increased by roughly 40 percent between 1970 and 1986. The violent crime rate in Michigan remained above 700 through the early to mid 1990's. However, in the second half of the 1990's the violent crime rate, mirroring national trends, declined to a rate of 574.9 in 1999.

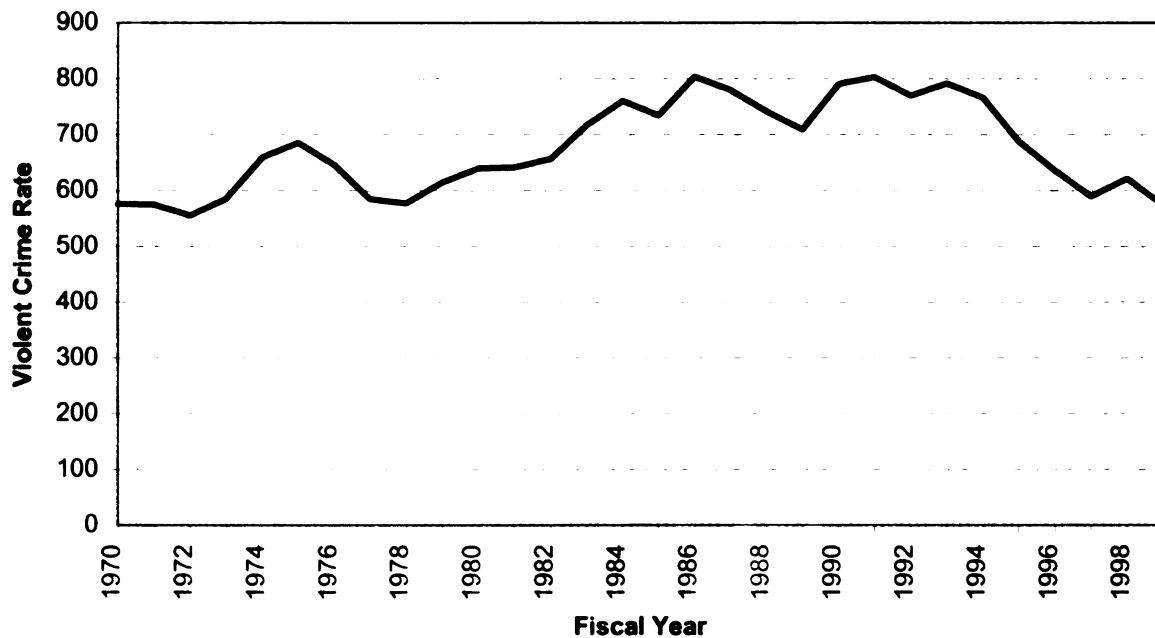


Figure 5.3: State of Michigan: Violent Crime Rate (Part I offenses known to police per 100,000 inhabitants), FY 1970-1999

Michigan – Independent Variable – Cohort

The size of the 18-24 cohort in Michigan increased from slightly over one million in 1970 to roughly 1.3 million in 1980. After this period of expansion in the age group most prone to criminal activity and most likely to attend institutes of higher learning, the size of the cohort declined to a low of 917,000 in 1997, only to rise slightly through 1999. Therefore, the majority of the growth in appropriations for corrections and higher education occurred during a period of time when the 18-24 cohort in Michigan was waning.

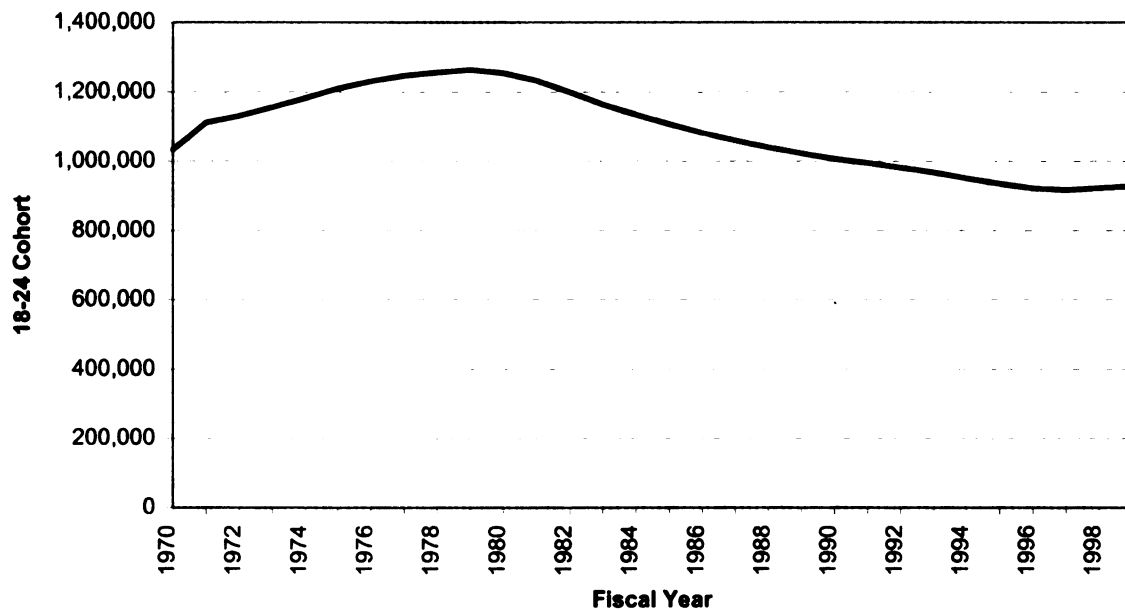


Figure 5.4: State of Michigan: 18-24 year old cohort, FY 1970-1999

Michigan – Independent Variable – Enrollment

Enrollment in public four-year institutions of higher education in Michigan grew roughly 20 percent between 1970 and 1999. Between 1970 and 1980 enrollment increased from 217,700 to 242,100 students. After a slight decline through 1984, enrollment increased to a high of 278,800 students in 1997 only to decline again slightly to roughly 260,000 in 1999.

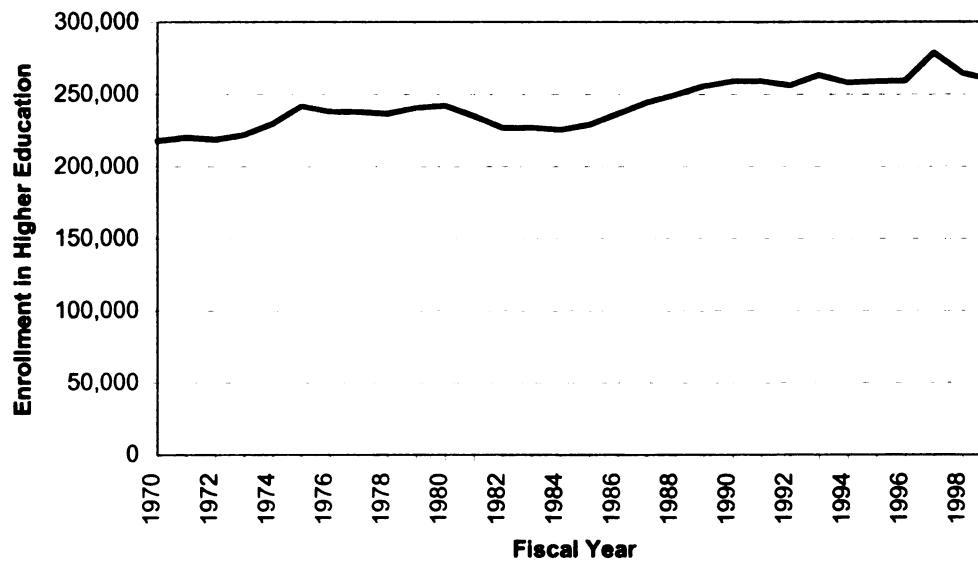


Figure 5.5: State of Michigan: Enrollment in Higher Education, FY 1970-1999

Michigan – *Correlation Matrix*

Now that an overview of policy changes and contextual conditions in Michigan have been provided, a preliminary look at the relationship between continuous variables in the model for corrections and higher education appropriations is provided in the form of a correlation matrix. By examining correlations between variables the strength of bivariate relationships and a preliminary diagnosis of multicollinearity can be conducted.

Table 5.1: Correlation Matrix for Variables included in the Budget Model, Michigan

	Corrections Appropriations	Higher Ed Appropriations	Budgetary Pie	Cohort (t-2)	Enroll (t-2)	Violent Crime (t-2)	Unemployment (t-2)
Corrections Appropriations	-- .000	.967 .000	-.130 .495	-.881 .000	.889 .000	.466 .009	-.498 .006
Higher Ed Appropriations	.967 .000	-- .000	-.135 .478	-.824 .000	.873 .000	.582 .001	-.409 .028
Budgetary Pie	-.130 .495	-.135 .478	-- .000	.069 .727	-.208 .289	-.053 .783	.092 .640
Cohort (t-2)	-.881 .000	-.824 .000	.069 .727	-- .000	-.693 .000	-.287 .123	.634 .000
Enroll (t-2)	.889 .000	.873 .000	-.208 .289	-.693 .000	-- .000	.296 .112	-.477 .008
Violent Crime (t-2)	.466 .009	.582 .001	-.053 .783	-.287 .123	.296 .112	-- .000	.261 .163
Unemployment (t-2)	-.498 .006	-.409 .028	.092 .640	.634 .000	-.477 .008	.261 .163	-- .000

Note: Pearson correlation statistic followed by significance level

The results shown in Table 5.1 illustrate that only a few of the continuous independent variables are significantly correlated and correlated in the hypothesized direction with appropriations for corrections and appropriations for higher education. These include the violent crime rate with corrections and the enrollment rate and the unemployment rate for higher education. For both corrections and higher education the size of the 18-24 cohort is significantly correlated in a direction that is counter to the hypothesized direction. In addition, the size of the budgetary pie is correlated in a direction that is opposite of the hypothesized relationship and is not statistically significant with both corrections and higher education. Finally, there are no correlations between independent variables that exceed the magnitude of .7. This preliminary investigation suggests that multicollinearity

is not a problem. Results of diagnostic procedures will be presented later in this chapter that allow for a more formal test for the presence of multicollinearity.

Michigan – Two Stage Least Squares

The hypotheses laid out in Chapter 3 will be tested using the data from Michigan in both levels and in differences. Before estimation can be undertaken the data itself is diagnosed and adjusted to account for several methodological issues. First, to avoid problems associated with spurious regression, the Augmented Dickey-Fuller (ADF) test is referenced to inform decisions regarding the transformation of data to induce stationarity. Second, tests for multicollinearity are conducted to help ensure that the standard errors of the coefficients do not become inflated. Finally, the data itself is adjusted to the appropriate lag structure. Table 5.2 presents the results of the ADF tests.

Table 5.2: Unit Root Tests (ADF)

	No Trend, No Intercept	Intercept, No Trend	Intercept and Trend
Corrections	8.163	4.186	-1.528
Corrections d1	-.817	-2.02	-3.633**
Corrections d2	-7.825***	-7.804***	-7.616***
Higher Ed	3.584	.272	-2.835
Higher Ed d1	-5.259***	-8.842***	-8.901***
Cohort	-.764	.206	-5.538***
Cohort d1	-.3.881***	-4.393***	-3.101**
Violent Crime	.062	-1.954	-.949
Violent Crime d1	-4.585***	-4.475***	-4.727***
Enroll	1.454	-.892	-2.424
Enroll d1	-5.068***	-4.475***	-4.727***
Unemployment	-.730	-1.451	-1.973
Unemployment d1	-4.833***	-4.766***	-4.811***
Pie	-4.468***	-9.382***	-9.378***

Note: * = .10; ** = .05; *** = .01 significance level

The results of the ADF tests reveal that all of the continuous variables in the model need to be differenced to induce stationarity, except for the size of the budgetary pie. Appropriations for higher education, the size of the 18-24 year old cohort, the violent crime rate, and the unemployment rate all need to be first differenced to make these series $I(0)$. Stationarity for appropriations for corrections is achieved by second differencing the series. In addition, collinearity diagnostics in Stata reveal that the condition number for all the independent variables is 8.27 and none of the VIF's associated with the independent variables exceed ten. As such, potential problems associated with multicollinearity can be ruled out. Finally, all non-endogenous variables are lagged two time periods to ensure the correct specification of their relationship with the budgetary process in regards to time. Now that data issues have been addressed estimation is conducted on the data in levels and differences utilizing two stage least squares.

Table 5.3 presents the results of robust 2SLS estimation for the data both in levels and in differences. The model for corrections in levels is able to explain 99 percent of the variance and diagnostics tests reveal that autocorrelation is not a problem.⁶ The results in levels illustrate that the coefficients associated with the political ideology of the governor, the implementation of mandatory minimums,⁷ and the implementation of

⁶ At the sixth lag, the Ljung-Box Q statistic is insignificant (.0987) and the Q stat generated from the Portmanteau test for white noise is insignificant (.1532). Furthermore, heteroskedastic consistent estimators are used by applying Huber-White robust estimates of the standard errors.

⁷ Mandatory minimums is coded as zero's predating the implementation of reforms, 1 in 1977 (felony firearms), and 2's from 1978 on (Proposal B and 650 Lifer in 1978). As such, it represents the cumulative impact of various mandatory minimum policies ranging from minimum sentences for firearm possession to drug possession.

the Prison Overcrowding Emergency Powers Act⁸ are significant at the .05 level and in the hypothesized direction. The results of the estimation imply that corrections receives on average 104.8 percent of the amount appropriated for higher education. In other words, for every dollar appropriated for higher education, corrections receives one dollar and an additional 5 cents. Thus, while controlling for other explanatory factors it can be seen that corrections is growing at a faster rate than higher education. While not fitting the classic model of a tradeoff relationship where an increase in one budgetary category leads to a decrease in another category, budgetary appropriations in Michigan expresses a form of tradeoff where corrections experiences gains at the expense of higher education. In addition, the presence of a Republican governor leads to an average increase in appropriations for corrections of \$127.7 million. This implies that while in office Republican governors in Michigan have led to the expansion of the criminal justice system. Furthermore, the implementation of a series of policies imposing mandatory minimum sentences on certain offenses led to an average increase in appropriations of

⁸ It is hypothesized that the implementation of the EPA by governors in Michigan would lead to decreased appropriations for corrections by removing some of the fiscal demands placed on corrections via early release.

Table 5.3: Two Stage Least Squares (robust) – Levels and Differenced, Michigan

	Levels				Differenced			
	Corrections		Higher Ed		Corrections		Higher Ed	
	Coef	t-value	Coef	t-value	Coef	t-value	Coef	t-value
Constant	884.53	**3.14	-144.26	-0.46	172.98	1.30	92.32	**2.52
Corrections	--	--	0.8837	**8.51	--	--	-0.0185	-0.27
Higher Education	1.0482	**10.13	--	--	-0.160	-1.12	--	--
Pie	0.0494	0.97	-0.0244	-.045	-0.075	-1.87	-0.1021	1.56
Cohort	-0.0013	** -6.17	0.00058	1.93	-0.001	-0.77	-0.0001	-0.10
Enrollment	--	--	0.00031	0.20	--	--	-0.0001	0.03
Violent Crime	-0.0634	-0.18	--	--	-0.232	-0.81	--	--
Unemployment	6.3118	0.74	2.3879	0.52	-4.805	-1.07	-11.333	-1.32
Governor	127.656	**2.90	-141.47	** -6.24	5.238	0.14	-16.115	-0.29
Mandatory Mins.	74.966	**2.77	--	--	-43.16	-1.31	--	--
Discipline Credit	-184.84	** -2.84	--	--	-29.85	-.055	--	--
EPA	-157.68	** -2.56	--	--	-10.77	-0.21	--	--
R ²	0.991		0.981		.		0.2881	
Hausman (chi ² prob)	0.000		0.0008		0.4393		0.9995	

Note: Corrections and Higher Education in millions; ** significant at .05

\$75 million for corrections, while the release of offenders under provisions of the EPA led to an average decrease of \$158 million holding all other factors constant. Finally, the coefficients associated with the size of the 18-24 year old cohort and the implementation of the disciplinary credit structure are significant at the .05 level but opposite the hypothesized direction. When the data is differenced none of the coefficients are significant predictors of appropriations for corrections.⁹

For higher education in levels the model is able to explain 98 percent of the variance and diagnostic tests reveal that problems associated with autocorrelation can be ignored. At the sixth lag, the Ljung-Box Q statistic is insignificant (.2454) and the Q stat generated from the Portmanteau test for white noise is insignificant (.3326).

⁹ Negative R-squared values are possible with the ivreg command in Stata (Sribner and Wiggins 2001). When negative the R-square value is not reported by Stata.

Furthermore, heteroskedastic consistent estimators are used by applying Huber-White robust estimates of the standard errors. The results reveal that only the coefficients associated with appropriations for corrections and the political ideology of the governor are significant. The results suggest that holding all other factors constant, appropriations for higher education grows at a slower rate than appropriations for corrections. In fact for every dollar appropriated for corrections, higher education receives 88 cents. In addition, the presence of a Republican governor leads to an average decrease of \$141.5 million per year. This suggests that in Michigan, Republican governors are increasing funding for corrections while at the same time decreasing funding for higher education. Governors in Michigan may in fact be trading off dollars for higher education for dollars for corrections. Finally, when the data is differenced none of the coefficients are significant predictors of appropriations for higher education.

Before moving on to talk about the triangulation of the results the issue of simultaneity must be addressed. To achieve this task OLS models are estimated for both corrections and higher education and these results are compared to the 2SLS estimates using the Durbin-Wu-Hausman test. This test examines whether the differences between the models are systematic. The results reported in Table 5.3 test the null hypothesis that there is not a systematic difference between the 2SLS and OLS results. The test reveals that the null hypothesis is rejected for both corrections and higher education in levels, implying that a simultaneous equations model is the appropriate methodology. In contrast, the null hypothesis is not rejected for both corrections and higher education in differences. This means that there is no simultaneity bias in the OLS estimates of these equations. However, it is still possible that the error terms of the OLS models used to

estimate corrections and higher education are correlated. As such, a seemingly unrelated regression is undertaken to estimate both corrections and higher education in differences.

Michigan – *Seemingly Unrelated Regressions*

Table 5.4 shows the results of the seemingly unrelated regression for the data in differences. The model for corrections captures 26 percent of the variance, while the model for higher education captures 29 percent of the variance. In addition, diagnostic tests rule out potential problems associated with autocorrelation. The test generates an insignificant (.0629) Q statistic equal to 18.889. For both corrections and higher education only the coefficients associated with the size of the budgetary pie are significant. Since appropriations for corrections is twice differenced and appropriations for higher education first differenced, the coefficients are difficult to interpret in a meaningful fashion. What is important to note is that that the seemingly unrelated regression model in differences does not do a good job in predicting appropriations for either corrections or higher education. Furthermore, the Breusch-Pagan test (Table 5.5) reveals that the two series are positively correlated. However, the relationship is insignificant suggesting that there is not a seemingly unrelated tradeoff relationship when the data is in differences.

Table 5.4: Seemingly Unrelated Regression (differences), Michigan

	Corrections		Higher Education	
	Coefficient	z-value	Coefficient	z-value
Constant	20.2364	1.53	81.0430	**2.46
Pie	-0.04685	** -2.74	-0.102398	** -2.66
Cohort	0.00026	0.99	0.000027	0.96
Enroll	--	--	0.000947	0.33
Violent Crime	-0.02129	-0.16	--	--
Unemployment	-2.64107	-0.83	-11.2776	-1.73
Governor	-10.9977	-0.75	-14.8655	0.68
Mandatory Minimums	-4.81645	-0.37	--	--
Disciplinary Credit	17.6559	0.62	--	--
EPA	30.0148	0.75	--	--
R ²	0.2580		0.2863	

Note: Corrections and Higher Education in millions; Data differenced; ** significant at .05

Table 5.5: Seemingly Unrelated Results (Breusch-Pagan Test), Michigan

	Correlation	Chi-square	Probability
Differenced-Differenced	0.2732	1.940	0.1637

This chapter has provided the results from the output of estimation conducted on the data in levels and in differences. A summary of the results for the two estimation paths is shown in Table 4.6. This table shows the sign and the p-value (in parentheses) of those coefficients that were found to be significant for corrections and higher education. The results reinforce the finding that for Michigan estimation in levels produce results that are more robust. As a result, none of the variables converge between the two paths. Instead, when the data is in levels higher education, the size of the cohort, the partisan ideology of the governor, the implementation of mandatory minimums, the EPA, and the statewide implementation of the disciplinary credit structure are significant for corrections, while only the budgetary pie is significant when the data is differenced. For higher education, corrections, the size of the 18-24 year old cohort, and the partisan

ideology of the governor are significant when the data is in levels, while only the size of the budgetary pie is significant when the data is differenced. To give these findings more meaning, they will be directly related to the statistical hypotheses.

Table 5.6: Triangulation of Estimates in Michigan

Corrections	2SLS (levels)	SUR (differenced)
Higher Education	+ (.000)	
Pie		- (.014)
Cohort	- (.000)	
Violent Crime		
Unemployment		
Governor	+ (.009)	
Mandatory Minimums	+ (.013)	
Discipline Credit	- (.011)	
EPA	- (.020)	
Higher Education	2SLS (levels)	SUR (differenced)
Corrections	+ (.000)	
Pie		- (.008)
Cohort	+ (.067)	
Enrollment		
Unemployment		- (.084)
Governor	- (.000)	

Note: +/- symbols are the signs of coefficients and p-values are in parenthesis ($\leq .125$).

The results in Michigan reveal: (1) that there is a tradeoff relationship between appropriations for corrections and appropriations for higher education. Appropriations for corrections grow at a faster rate than for higher education. (2) Exogenous factors help create policy relevant conditions that impact budgetary allocations. More specifically, the presence of a Republican governor leads to increases in appropriations for corrections and declines in appropriations for higher education. Between 1970 and 1999 Republican governors in Michigan placed a primacy on being tough on crime that led to increases in prison populations and ultimately to increases in appropriations for corrections.

Additionally, increases in the size of the 18-24 cohort leads to increases in the amount appropriated for higher education and decreases the amount appropriated for corrections. (3) An expanding budgetary pie does not lead to increases in appropriations for either corrections or higher education. (4) The implementation of specific public policies plays a big role in determining the amount of monies appropriated for corrections. The implementation of mandatory minimums leads to an increase in appropriations for corrections. Furthermore, the use of the Prison Overcrowding Emergency Powers Act by the governor leads to decreases in appropriations for corrections.

To obtain a richer view of these results predicted values are generated for fiscal years 1972-1999 for the data in levels. Table 5.7 presents the relative contribution of each of the independent variables towards the amount of monies appropriated for corrections in each of the fiscal years. The predicted total appropriations from the empirical model are presented as well as the actual amount appropriated.¹⁰ Examining the predicted values gives a more complete picture of how the different predictors impact total appropriations. This approach provides a way to look at the impact of exogenous factors as they vary over time and the implementation of specific public policies.

The constant term suggests that absent any other influences corrections would receive \$884.5 million. Beyond the constant, the factor most responsible for the size of appropriations for corrections is higher education. As discussed earlier, appropriations

¹⁰ An inspection of the predicted values in comparison to the actual values reveals that the empirical model does a good job in estimating appropriations for corrections. The only year in which the residual is noticeably large is FY 1976. This corresponds to a year in which actual appropriations for corrections increases from \$50.9 million in the previous fiscal year to \$100 million only to decline to \$99 million in the next FY. To account for this anomaly a model was run with a dummy variable inserted for FY 1976. Estimation of the model with the dummy variable did not change the results in any meaningful way. The same coefficients that are significant in the model without the dummy variable are significant in the model with the dummy variable and the magnitudes are roughly the same. Since there is no theoretical rationale or event that can account for this deviation, the results from the model without the dummy variable are presented.

for corrections exceeds appropriations for higher education by an average of 4.8 percent each year. Therefore, as appropriations for higher education rose from approximately \$378 million in FY 1972 to \$1.60 billion in FY 1999, appropriations for corrections attributable to higher education rose from \$396.3 million to \$1.68 billion.¹¹ The factor that is most influential in mitigating the large magnitude of the constant and appropriations attributable to higher education is the size of the 18-24 cohort. As the cohort size increases, appropriations for corrections decline. In addition, the presence of a Republican governor leads to increases in the size of appropriations in corrections of \$127.7 million. Furthermore, as the unemployment rate increases the amount of monies appropriated for corrections increases. For example, when the unemployment rate was at its highest in the early 1980's it resulted in appropriations for corrections that approached \$90 million. At the end of the 1990's when unemployment was on the decline appropriations attributable to the unemployment rate amounted to \$26.5 million. Finally, the impact of the size of the budgetary pie and the violent crime rate are somewhat marginal. Unlike California where the violent crime rate accounted for upwards of \$5 billion, the violent crime rate in Michigan is associated with a reduction of appropriations for corrections of a maximum of \$50 million.

The implementation of correctional policies in Michigan had a mixed impact on appropriations for corrections. The implementation of mandatory minimums accounted for increases of roughly \$150 million, while the implementation of disciplinary credits led to a decline of \$184.8 million. Finally, the use of the Prison Overcrowding Emergency Powers Act by the governor, over a four-year period, led to a decline in

¹¹ Since corrections and higher education are viewed as a system of equations, higher education acts as both an endogenous factor and an explanatory factor in the corrections equation.

appropriations of \$157.7 million. Therefore, in the aggregate the impact of these policies on the budget seems to cancel one another out. Nevertheless, recent sentencing policies and changes in the state economy may lead to increased appropriations in the future.

The implementation of truth in sentencing comes at a time when corrections receives roughly 16 percent of the entire state budget. This percentage is up dramatically from the 2 percent that it received in the early 1970's. While policies themselves have not been accountable for these growths, this policy change will necessitate that more monies be allocated towards corrections to accommodate increases in the prison population. Likewise, this policy is implemented at a time when the unemployment rate is at low for the period of time under study. As Michigan and other states again begin to struggle with fiscal crises, appropriations for corrections may continue to rise in Michigan at the expense of appropriations for higher education.

Table 5.7: Predicted Values for Appropriations for Corrections (in millions)

FY	Constant	Higher Education	Budgetary Pile	Cohort	Governor	Unemployment Rate	Violent Crime	Mandatory Minimums	Disciplinary Credit	EPA	Corrections Predicted	Corrections Actual
1972	884.530	1,048	0.049	-0.001	127.656	6.312	-0.063	74.966	-184.837	-157.676		
1973	884.530	396.272	12.307	-1380.685	127.656	42.289	-36.477	0.000	0.000	0.000	45.891	40.460
1974	884.530	443.661	19.567	-1485.079	127.656	47.970	-36.411	0.000	0.000	0.000	1.894	43.660
1975	884.530	528.177	12.307	-1510.660	127.656	44.183	-35.182	0.000	0.000	0.000	51.010	56.540
1976	884.530	535.525	19.567	-1544.609	127.656	37.240	-37.079	0.000	0.000	0.000	22.830	50.850
1977	884.530	775.259	4.840	-1579.858	127.656	46.707	-41.784	0.000	0.000	0.000	217.350	100.020
1978	884.530	647.127	48.326	-1617.187	127.656	78.897	-43.452	0.000	0.000	0.000	125.897	99.510
1979	884.530	717.304	-15.064	-1645.494	127.656	58.700	-40.936	0.000	0.000	0.000	86.695	140.280
1980	884.530	640.471	27.923	-1666.882	127.656	51.757	-37.053	74.966	0.000	0.000	103.367	148.510
1981	884.530	706.256	13.041	-1679.184	127.656	43.551	-36.576	149.932	0.000	0.000	209.206	174.890
1982	884.530	666.750	27.541	-1690.171	127.656	49.232	-38.921	149.932	0.000	0.000	176.548	195.550
1983	884.530	751.130	-16.142	-1676.770	127.656	78.266	-40.523	149.932	0.000	0.000	258.077	227.640
1984	884.530	818.120	22.282	-1646.864	127.656	77.635	-40.673	149.932	0.000	-157.676	234.941	231.100
1985	884.530	797.932	-1.359	-1603.223	127.656	97.833	-41.604	149.932	0.000	-157.676	254.020	264.750
1986	884.530	887.259	22.713	-1555.522	0.000	89.628	-45.412	149.932	0.000	-157.676	275.452	313.660
1987	884.530	1025.454	6.466	-1515.325	0.000	70.692	-48.165	149.932	0.000	-157.676	415.909	389.190
1988	884.530	1093.671	20.879	-1479.983	0.000	62.487	-46.517	149.932	-184.837	0.000	500.162	482.920
1989	884.530	1161.825	22.025	-1445.945	0.000	55.544	-50.941	149.932	-184.837	0.000	592.133	557.140
1990	884.530	1198.009	10.437	-1416.983	0.000	51.757	-49.434	149.932	-184.837	0.000	643.409	614.680
1991	884.530	1253.144	10.078	-1390.444	0.000	47.970	-47.000	149.932	-184.837	0.000	723.372	713.900
1992	884.530	1224.109	26.261	-1367.038	0.000	44.814	-44.937	149.932	-184.837	0.000	732.833	789.320
1993	884.530	1358.111	18.333	-1346.145	0.000	47.970	-50.084	149.932	-184.837	0.000	877.809	866.580
1994	884.530	1375.553	-3.896	-1329.915	127.656	58.700	-50.888	149.932	-184.837	0.000	1026.833	978.940
1995	884.530	1382.681	5.997	-1312.179	127.656	56.175	-48.797	149.932	-184.837	0.000	1061.157	1107.330
1996	884.530	1444.608	7.840	-1294.045	127.656	44.814	-50.156	149.932	-184.837	0.000	1130.341	1177.620
1997	884.530	1492.521	13.680	-1271.312	127.656	37.240	-48.547	149.932	-184.837	0.000	1200.863	1268.800
1998	884.530	1566.944	12.720	-1250.543	127.656	33.453	-43.585	149.932	-184.837	0.000	1296.269	1299.300
1999	884.530	1631.450	-7.493	-1232.647	127.656	30.928	-40.257	149.932	-184.837	0.000	1359.260	1330.270
	884.530	1677.644	14.796	-1226.016	127.656	26.510	-37.384	149.932	-184.837	0.000	1432.831	1368.560

CHAPTER 6

The third and final state examined in this dissertation is Virginia. Similar to California and Michigan, Virginia experienced several policy reforms that shifted the practice of sentencing from indeterminate to determinate. This chapter proceeds by providing an overview of these policy changes and a brief review of the contextual background in Virginia. This overview is followed by the estimation of models for corrections and higher education appropriations. The estimation strategy laid out in Chapter 3 is utilized as a framework to test the various budgetary hypotheses.

Virginia – Policies

In 1974, Virginia's Judicial Conference passed a resolution stating judicial opposition to the principles of mandatory sentencing. The conference spoke out against the various forms of determinate and presumptive sentencing and asserted that judicial discretion needed to be maintained (Shane-Dubow, Brown, and Olsen, p. 257). In spite of the urging of the judiciary, the legislature soon thereafter passed legislation that would begin a movement away from indeterminacy. In 1975, Virginia adopted a reorganization of its criminal code by implementing a classification scheme that divided most criminal offenses into six felony classes.¹ Each class prescribed both a minimum and maximum sentence within which a trial judge (or jury) would set the minimum and maximum terms of imprisonment. For example, offenders convicted of class I offenses would receive life imprisonment or a sentence of death, while class VI offenses carried a penalty of one to

¹ Shane-Dubow, Brown and Olsen (1985) claim that the new code resulted in little substantial change from previous Virginia law (257).

five years' imprisonment or confinement in jail up to one year and fine up to \$1,000. In all cases where parole was a possibility, the actual release time from prison fell on the parole board (See Table 6.1). The aim of this particular reform was to eliminate "the unduly wide variations between minimum and maximum penalties and facilitating rational grading of crimes by comparative seriousness" (257). Following the imposition of this classification scheme, Virginia would undertake a series of reforms that would include mandatory minimums and a move towards determinacy.²

Table 6.1: 1975 Virginia Sentencing Schema³

Class	Minimum and Maximum Sentence
I	Life imprisonment or death
II	Twenty years to life imprisonment
III	Five to twenty years imprisonment
IV	Two to ten years imprisonment
V	One to ten years imprisonment or confinement in jail up to one year and a fine up to \$1,000
VI	One to five years' imprisonment or confinement in jail up to one year and a fine up to \$1,000

² In 1978 and 1979 a Presumptive Sentencing Act was introduced and later defeated in the General Assembly. The acts called for the abolition of parole, the establishment of a council to generate sentencing guidelines, and the elimination of programs designed to accelerate release dates from prison (Shane-Dubow, Brown, and Olsen, 257).

³ Table adopted from Shane-Dubow, Brown, and Olsen (258).

In addition to establishing a set of maximum and minimum sentences for felony classes, legislation in 1975 introduced mandatory minimums for offenses involving firearms. The legislation made the use or display of a firearm in the commission of a felony a separately punishable felony offense. First time offenders were to receive a one-year sentence and a three-year sentence for subsequent offenses. These sentences were to be served consecutively to any other sentence and could not be suspended or reduced by parole (Shane-Dubow, Brown, and Olsen, 258). This law was subsequently amended in 1982, increasing first convictions to two years and subsequent convictions to four years.

Additionally, changes were made to the statutes relating to recidivistic behavior. Prior to 1979, additional penalties were imposed upon habitual offenders in a supplementary court proceeding. Offenders with one prior conviction would receive a one year sentence enhancement and offenders with two and three previous convictions would receive three and five year enhancements, respectively. The enhancements were to be served consecutively with other penalties, the offender was not eligible for parole during the enhancement period, and the sentence could not be suspended. Legislation enacted in 1979 repealed previous recidivist statutes and incorporated penalties for repeat offenders into the parole system.

Before the legislative changes most offenders were eligible for parole after serving one-fourth of their sentence or twelve years (whichever was smaller). Under the new laws these provisions remained the same for first time offenders, but parole eligibility for repeat offenders was made harsher. Second time offenders were now eligible for parole after serving thirteen years or one-third of the term; third time offenders were eligible for parole after serving fourteen years or one-half of their term;

and offenders with four or more prior convictions were eligible for parole after serving fifteen years or three-quarters of the term. For each of these, the smaller of the two terms would be selected (Shane-Dubow, Brown, and Olsen, 258).

An additional reform was enacted in 1995 with the adoption of truth in sentencing. Prior to the reform, indeterminate sentencing procedures allowed violent criminals to be released early from prison by parole boards. For example, criminals convicted of first-degree murder served on average about 10 years of a 35-year sentence and rapists sentenced to 9.2 years on average were released after 4.4 years. The Virginia Governor's Commission on Parole Abolition and Sentencing Reform argued that if serious offenders had been required to serve more time in prison, between 1986 and 1994, 4,375 crimes would not have been committed (Edwards, 479). In an attempt to restore public confidence in the criminal justice system and to ensure certainty and predictability in sentencing, the state of Virginia adopted a determinate sentencing format in the form of sentencing guidelines and truth in sentencing.

Sentencing guidelines trace their origin to a series of newspaper articles and reports that claimed that sentencing decisions in Virginia were inconsistent and disparate. In response to these claims, Governor Charles Robb appointed a Task Force on Sentencing, in 1982, to study sentencing policies and recommend any changes deemed necessary to improve sentencing practices. In 1983, the Task Force concluded that variation existed in the use of incarceration as a sanction and in the length of prison terms for "similarly situated offenders." They found that factors associated with disparity included offender race and socioeconomic status (extralegal factors). As such, the Task

Force recommended a move towards determinacy in the form of historically based sentencing guidelines (Ostrom et al. 1999, 10).

The original guidelines that were established were based on historical sentencing patterns across the state of Virginia. The Virginia Criminal Sentencing Commission analyzed data from 33,573 felony cases sentenced between February 1985 and June 1987 and constructed a set of voluntary sentencing guidelines that were initially pilot tested in six judicial circuits in 1988 (Ostrom et al. 1999, 14). It was found that the voluntary guidelines improved the extent to which similarly situated offenders who committed similar crimes received similar sentences (consistency) and reduced variation in sentence lengths due to extralegal factors (neutrality). As such, the voluntary guidelines were adopted statewide in 1991.⁴ These guidelines were monitored annually and adjusted over the next three years to ensure a correspondence between the guidelines and judicial sentencing practice (Ostrom et al. 1999, 16).

Additionally, in September 1994, the state of Virginia passed truth in sentencing legislation (HB5001 and SB3001).⁵ The policy banned discretionary parole for all felony offenses and stated that offenders convicted of violent crimes in Virginia must serve at least 85 percent of their sentences.⁶ Governor George F. Allen stated that this legislation allowed Virginia to restore “integrity and honesty and accountability to our criminal

⁴ The voluntary sentencing guidelines structure required judges to fill out a sentencing guidelines worksheet for each sentenced offender. Under this system, judges still maintained discretion in their ability to adjust the recommended sentences up or down depending upon circumstances, without having to explain their departure. Between 1995 and 1997 the compliance rate with the guidelines was 75.2% with a departure rate of 24.8% (Ostrom et al. 1998, 13).

⁵ In 1994, Virginia also enacted a three strikes law. The law provided mandatory life without parole for offenders convicted of a third felony involving designated acts of violence. Those sentenced under the law who reached 65 years of age and who had served five years were allowed to petition the parole board for conditional release (Edwards, 470). Shortly after the law was passed Virginia eliminated parole for all sentences and zero offenders have been sentenced under this statute.

⁶ The truth in sentencing law defines a long list of crimes as violent, including: murder, rape, and robbery and several offenses not traditionally viewed as violent (burglary, child pornography, and computer crimes).

justice system” (Edwards, 479). On a similar note, Ostrom et al. (1999) point out that this legislation grew out of the perception among the public that the parole board’s release decisions during the early 1990’s were too lenient (17). Thus, parole was replaced by a system that made punishment more certain, predictable, and severe.

In conjunction with the new truth in sentencing legislation, the sentencing guidelines were adjusted to reflect the new focus on determinacy and a ‘get tough’ policy towards violent and repeat offenders. Under the new guidelines, the sentences for violent criminals and offenders with prior felony convictions were increased so that repeat violent offenders would serve sentences as much as five times longer than before, while incarceration rates and time served levels remained consistent with past practices for non-violent, non-repeat offenders. For example, someone convicted of first-degree murder with no violent prior record would receive a sentence of 40 years and have to serve around 34 years (up from 10 years). Additionally, an offender convicted of first-degree murder with a serious violent record would receive a sentence of 84.6 years, up from 14.7 years under the statutes followed in 1988 through 1992. State criminal justice officials calculated that these increased sentences would prevent 119,000 felonies, including 26,000 violent crimes over a 10-year period (Allen, 6). The state legislatures estimated that these changes would necessitate the construction of 26 new prisons at a cost of about \$2 billion and entail additional billions for prison operations (Mauer, S6).

Virginia – Prison Population

Virginia’s prison population has grown from 4,981 inmates in 1971 to 28,385 inmates in 1997, representing an increase of 470%. Over this time period the

incarceration rate per 100,000 inhabitants increased from 108.9 to 412. The rapid increase in the number of prisoners began in 1975, following a brief period of stability. The prison population grew steadily until 1989, when a period of rapid growth began, culminating with an 18% growth between 1993 and 1994.

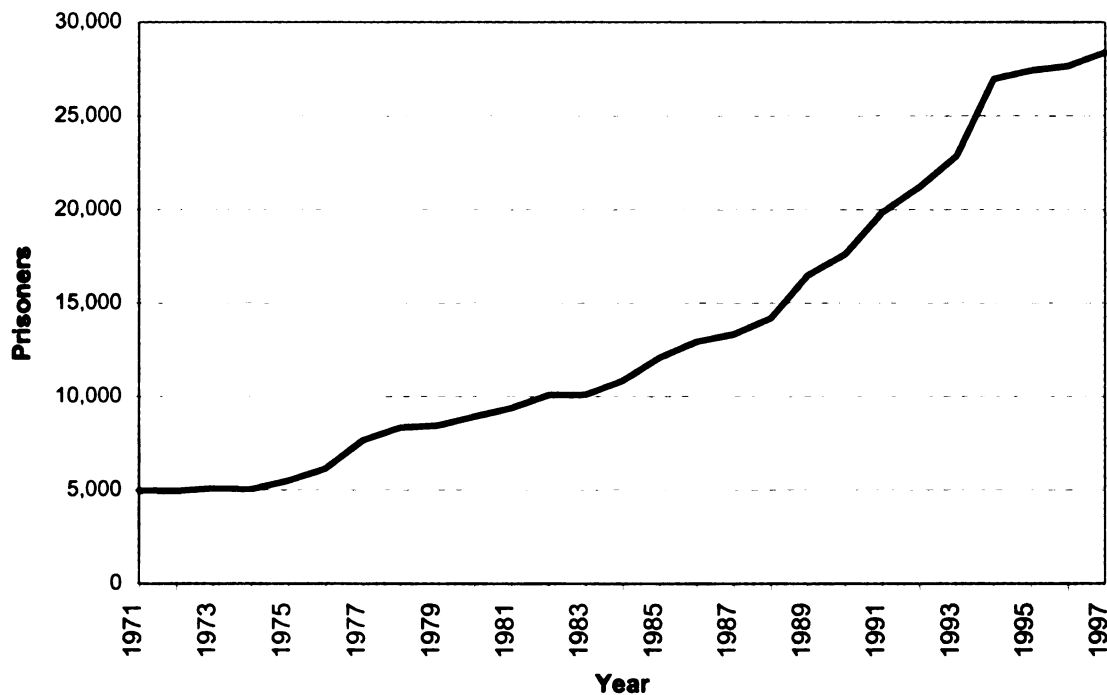


Figure 6.1: Number of Prisoners Under State Jurisdiction in Virginia: 1971-1997

Virginia – Independent Variable – Governors

During the period of study Virginia had eight governors, five of whom were Republicans. Between 1970 and 1982 a Republican was governor. During this span the following Republicans were governor: Linwood Holton (1970-1974), Mills Goodwin, Jr. (1974-1978), and John Dalton (1978-1982). Over the next decade and a half Democrats held the governorship in Virginia. The governors during this time period were Charles

Robb (1982-1996), Gerald Baliles (1986-1990), and Douglas Wilder (1990-1994).

Finally, two successive Republican governors succeeded Governor Wilder. These were George Allen (1994-1998) and Jim Gilmore (1998-present). As such, it can be seen that Virginia had a Republican governor during 18 years of the time under study.

Virginia – Independent Variable – Unemployment Rate

During the time period under study the rate of unemployment in Virginia fluctuated between a rate of 3 percent and 8 percent. The peak years of unemployment occurred in 1975 (6.4), 1982 (7.7), and 1992 (6.4). These highs are significantly lower than the unemployment rate found in Michigan in the mid 1980's. As can be seen in Figure 6.2 the rate of unemployment in Virginia is characterized by periods of increases followed by periods of decline. The periods of growing unemployment occurred between 1973 and 1975; 1979 and 1982; 1989 and 1992. These periods of growth correspond to those experienced in California. During these times of high unemployment states face increased fiscal demands and hence added pressures on their budgets. Finally, after 1992 the unemployment rate declined to a low of 2.8 in 1999. It is hypothesized that rising unemployment rates will lead to decreases in appropriations for higher education and increases in appropriations for corrections.

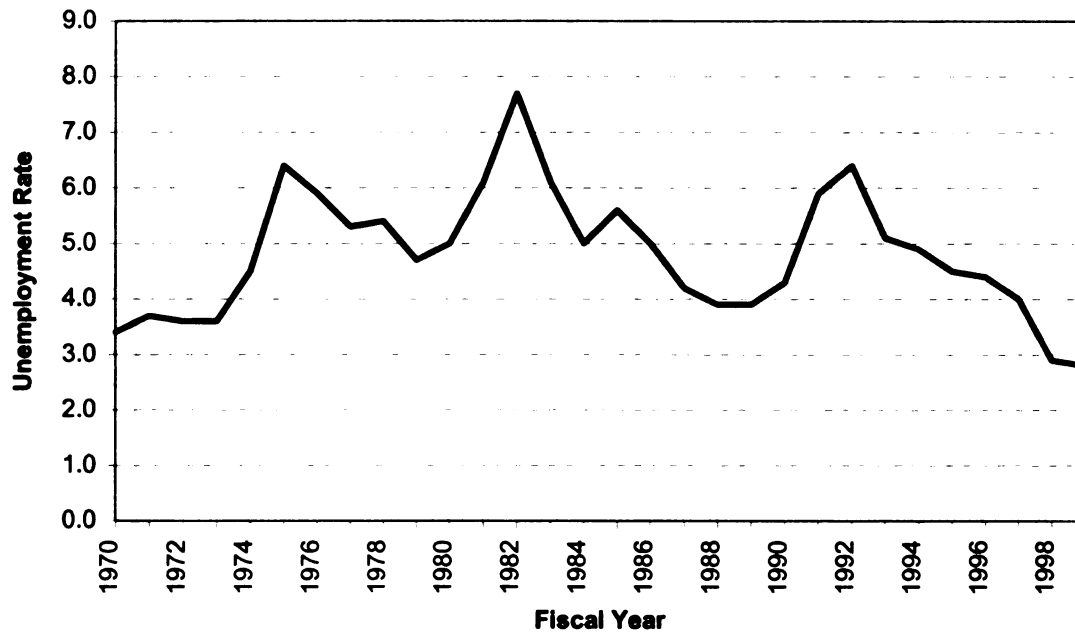


Figure 6.2: State of Virginia: Unemployment Rate, FY 1970-1999

Virginia – Independent Variable – Violent Crime Rate

The violent crime rate in Virginia rose slightly between 1970 and 1975. During this period of time the rate of violent offenses known to police per 100,000 inhabitants increased from 302 in 1970 to 380 in 1975 (see Figure 6.3). Following a sharp decline between 1975 and 1978, the violent crime rate remained fairly steady at 300 up until 1989. However, in the early 1990's (1990-1993) the violent crime rate rose to 375. It was in response to this growth that Governor Allen implemented many of the 'tough on crime' policies in the mid 1990's. In the remainder of the 1990's the violent crime rate experienced a steady decline to a rate of 315 in 1999. Between 1970 and 1999 the violent crime rate in Virginia was significantly lower than the rate found in California (high of 1,200 in 1992) and Michigan. Nonetheless, all three states experienced an increase in the early 1990's followed by a decrease in the late 1990's.

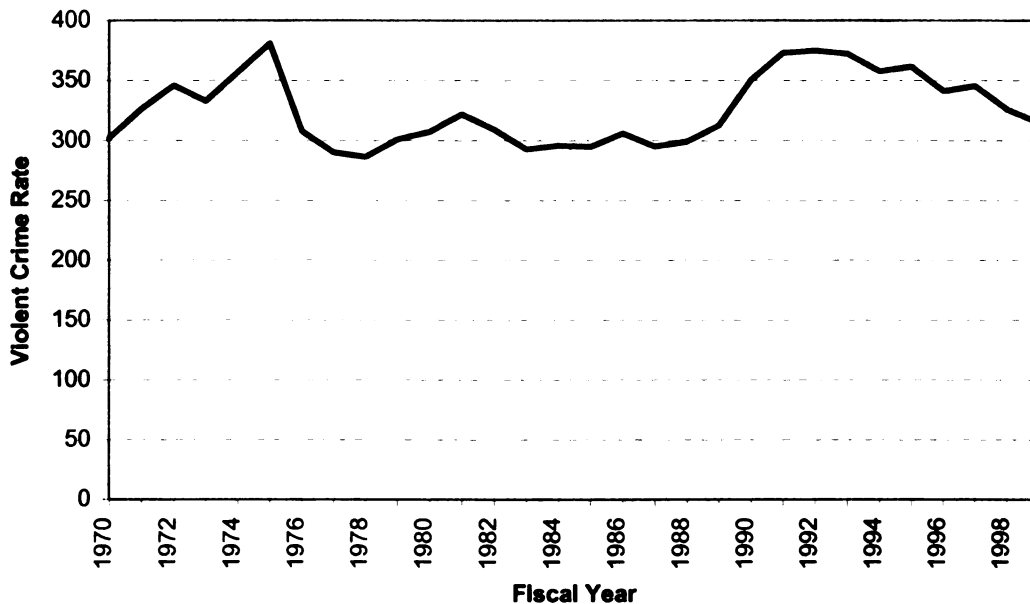


Figure 6.3: State of Virginia: Violent Crime Rate (Part I offenses known to police per 100,000 inhabitants), FY 1970-1999

Virginia – Independent Variable – Cohort

The size of the 18-24 year old cohort increased from approximately 615,000 individuals in 1970 to 750,000 individuals in 1984 (see Figure 6.4). Following this period of steady growth, the size of this cohort began to diminish. By 1997 the size of this cohort was 648,000. At the end of the century this cohort increased again to 673,000 in 1999.

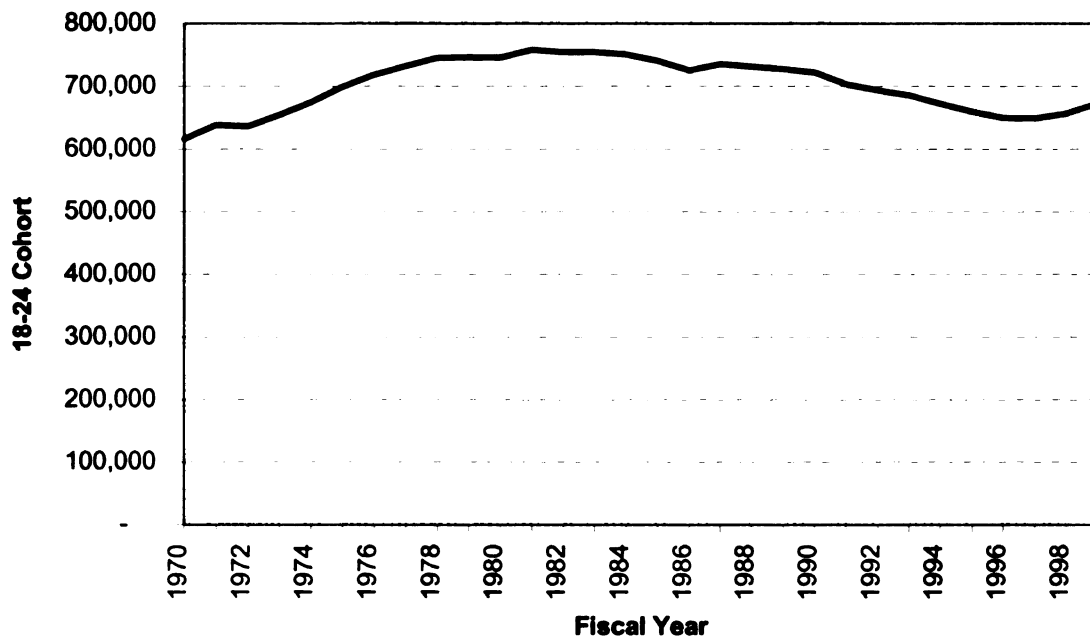


Figure 6.4: State of Virginia: 18-24 year old cohort, FY 1970-1999

Virginia – Independent Variable – Enrollment

Unlike California and Michigan, fall enrollment in public 4-year institutions of higher education in Virginia increased steadily between 1970 (94,028 students) and 1999 (175,275). During this period enrollment in the Virginia system of higher education grew roughly 85 percent. Increasing enrollments place additional demands on Virginia's fourteen four-year public institutions of higher education.

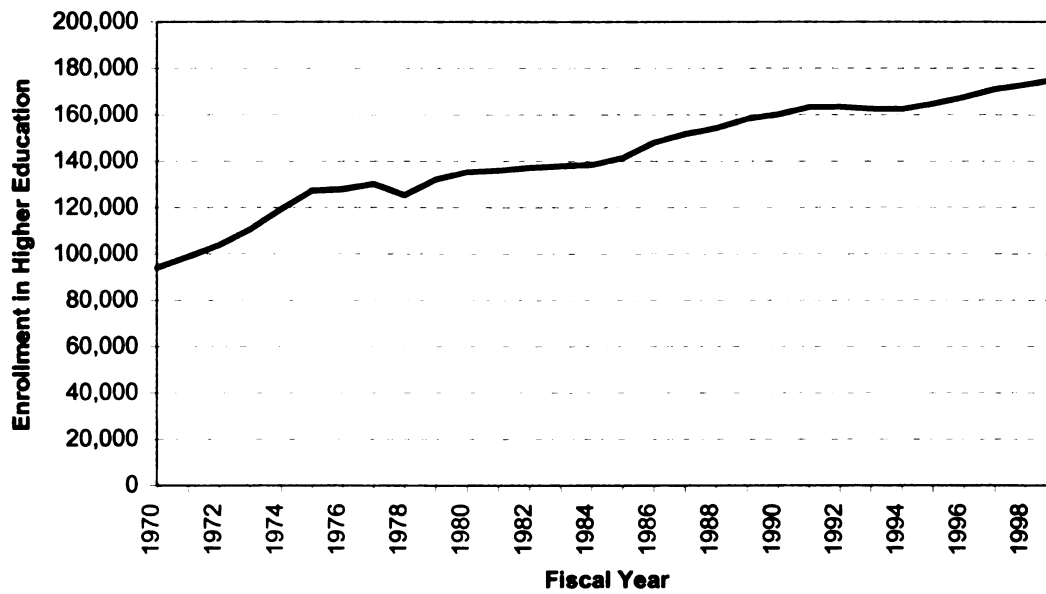


Figure 6.5: State of Virginia: Enrollment in Higher Education, FY 1970-1999

Virginia – Correlation Matrix

In order to assess the strength and directionality of bivariate relationships between the variables in the corrections and higher education models a correlation matrix is constructed. These correlations can also be used to diagnose the possibility of collinearity, which could potentially lead to biased estimation of the effects of the independent variables on appropriations for corrections and higher education.

Table 6.2: Correlation Matrix for Variables included in the Budget Model, Virginia

	Corrections Appropriations	Higher Ed Appropriations	Budgetary Pie	Cohort (t-2)	Enroll (t-2)	Violent Crime (t-2)	Unemployment (t-2)
Corrections Appropriations	--	.945 .000	.519 .004	-.136 .491	.919 .000	.408 .031	-.046 .817
Higher Ed Appropriations	.945 .000	--	.628 .000	.019 .924	.942 .000	.163 .397	-.150 .439
Budgetary Pie	.519 .004	.628 .000	--	-.140 .468	.511 .005	.084 .663	-.070 .719
Cohort (t-2)	-.136 .491	.019 .924	-.140 .468	--	.100 .600	-.504 .005	.600 .000
Enroll (t-2)	.919 .000	.942 .000	.511 .005	.100 .600	--	.272 .147	-.024 .899
Violent Crime (t-2)	.408 .031	.163 .397	.084 .663	-.504 .005	.272 .147	--	.066 .730
Unemployment (t-2)	-.046 .817	-.150 .439	-.070 .719	.600 .000	-.024 .899	.066 .730	--

Note: Pearson correlation statistic followed by significance level

The results shown in Table 6.2 illustrate that all of the continuous independent variables are significantly correlated and correlated in the hypothesized direction with appropriations for corrections and appropriations for higher education, except for the size of the 18-24 cohort and unemployment with corrections. These variables are both correlated in a direction that is opposite of the hypothesized relationship and are not statistically significant. Significant correlations in the hypothesized direction include: appropriations for corrections being positively correlated with the size of the budgetary pie and the violent crime rate. Furthermore, appropriations for higher education is positively correlated with the size of the budgetary pie, enrollment, and negatively correlated with the unemployment rate. These results are in line with previous theoretical

expectations. In addition, there are no correlations between independent variables that exceed the magnitude of .7. This suggests that multicollinearity is not a problem. Diagnostic procedures later in this chapter will more formally test for the presence of multicollinearity that may lead to imprecise estimates.

Virginia – *Two Stage Least Squares*

Following the estimation strategy laid out in Chapter 3, estimation is conducted for the Virginia data in both levels and in differences. Before estimation can occur the data must be tested for unit roots, multicollinearity, and adjusted for the appropriate lag structure. The decision to transform the data via differencing is made by referencing the Augmented Dickey-Fuller (ADF) test. This test provides a way to look for unit roots and hence avoid the problems associated with spurious regression. Table 6.3 presents the results of the ADF tests.

Table 6.3: Unit Root Tests (ADF)

	No Trend, No Intercept	Intercept, No Trend	Intercept and Trend
Corrections	7.69	3.808	-.292
Corrections d1	-1.799*	-3.851***	-6.265***
Higher Ed	4.852	1.525	-.525
Higher Ed d1	-1.113	-2.075*	-2.283
Higher Ed d2	-7.521***	-7.525***	-7.618***
Cohort	.725	-2.044	-2.555
Cohort d1	-2.682***	-2.639*	-2.485
Cohort d2	-8.147***	-7.979***	-7.934***
Violent Crime	.034	-2.022	-1.959
Violent Crime d1	-4.649***	-4.542***	-4.450***
Enroll	4.440	-2.636*	-2.722
Enroll d1	-2.733***	-3.921***	-4.255***
Unemployment	-.533	-1.975	-2.073
Unemployment d1	-4.411***	-4.334***	-4.468***
Pie	-.942	-2.724**	-4.019***
Pie d1	-8.738***	-8.819***	-8.937***

Note: * = .10; ** = .05; *** = .01 significance level

The results suggest that all of the continuous variables included in the model, except for the budgetary pie, need to be transformed. It was determined that appropriations for corrections, the size of the 18-24 cohort, the violent crime rate, enrollment, and the unemployment rate, all need to be first differenced to make these series $I(0)$. In addition, appropriations for higher education is differenced twice in order to induce stationarity. Furthermore, collinearity diagnostics in Stata reveal that the condition index between the independent variables is 4.5 and none of the VIF's associated with the independent variables exceed 10. Therefore, potential problems associated with multicollinearity can be ruled out. Finally, all non-endogenous variables are lagged two time periods to more accurately reflect the impact of exogenous factors and public policies on the budgeting

process. Now that issues relating to the data have been addressed estimation is performed on the data in levels and differences utilizing 2SLS.

Table 6.4 includes results of the two-stage simultaneous estimation for both data in levels and the transformed data. This approach is utilized to prevent biased estimators that would result from the use of OLS. The model in levels for corrections is able to explain 99 percent of the variation and diagnostic tests rule out potential problems related to autocorrelation.⁷ The results in levels illustrate that the coefficients associated with higher education, the political ideology of the governor, and the implementation of sentencing guidelines are significant at the .05 level. All of these coefficients are in their hypothesized direction. The results of the estimation imply that corrections receives on average 72 percent of the amount appropriated for higher education, holding all other factors constant. Put another way, for every dollar higher education receives, corrections receives 72 cents. Thus, while appropriations for corrections have been increasing from roughly \$13.5 million in FY 1971 to over \$573 million in FY 1999, the gain is not coming at the expense of higher education, when controlling for the influence of the other explanatory factors. In addition, the presence of a Republican governor leads to an average increase in appropriations for corrections of \$33.4 million per year. This implies that Republican governors in Virginia are willing to expand the criminal justice system while in office. Furthermore, the implementation of sentencing guidelines and the resultant tougher sentences for violent and repeat offenders leads to an average increase in appropriations for corrections of approximately \$70.9 million per year, holding all

⁷ At the sixth lag, the Ljung-Box Q stat is insignificant (.1050) and the Q stat generated from the Portmanteau test for white noise is insignificant (.2510). Furthermore, heteroskedastic consistent estimators are used by applying robust estimation.

other factors constant. Finally, when the data is differenced none of the coefficients in the corrections model are significant.

Table 6.4: Two Stage Least Squares (robust) – Levels and Differenced, Virginia

	Levels				Differenced			
	Corrections		Higher Ed		Corrections		Higher Ed	
	Coef	t-value	Coef	t-value	Coef	t-value	Coef	t-value
Constant	51.329	0.23	-639.11	** -5.86	6.410	0.04	-32.70	-1.69
Corrections	--	--	1.289	**7.70	--	--	0.0653	1.04
Higher Education	0.7176	**3.89	--	--	-.0246	-.003	--	--
Pie	-0.0339	-0.18	0.0561	1.44	-0.041	-0.29	0.0439	1.37
Cohort	-0.0005	-1.69	0.0016	**5.51	.0011	1.61	0.0008	1.02
Enrollment	--	--	-0.0013	-0.76	--	--	0.0020	0.87
Violent Crime	0.4615	1.24	--	--	0.100	0.21	--	--
Unemployment	2.7097	0.18	-26.298	** -2.74	-1.991	-0.49	-2.826	-0.35
Governor	33.442	**2.60	-45.896	** -2.66	-12.98	-0.19	0.9212	0.06
Mandatory Min	15.682	0.40	--	--	4.180	0.05	--	--
Repeat Offender	-8.236	-0.55	--	--	25.70	0.33	--	--
Sentencing Guide	70.930	**2.43	--	--	26.83	0.43	--	--
Truth in Sentencing	33.442	-0.59	--	--	21.01	0.13	--	--
R ²	0.989		0.978		0.644		0.175	
Hausman (chi ² prob)	0.0018		0.0016		0.972		0.3683	

Note: Corrections and Higher Education in millions; ** significant at .05

The model for higher education in levels is able to explain 98 percent of the variance and diagnostic tests for autocorrelation reveal that potential inflated variances associated with this condition do not exist.⁸ The coefficients associated with corrections, the size of the 18-24 cohort, the unemployment rate, and the political ideology of the governor are all significant and in the hypothesized direction for higher education. These results suggest that for every dollar corrections receives, higher education receives one dollar and an additional 29 cents. Second, higher education can be seen to be responsive to the demand of an increasing cohort of individuals (18-24) who are most likely to pursue some form of postsecondary education. For every additional individual in this

⁸ At the sixth lag, the Ljung-Box Q stat is insignificant (.1986) and the Q stat generated from the Portmanteau test for white noise is insignificant (.3071). Furthermore, heteroskedastic consistent estimators are used by applying robust estimation.

cohort \$1,600 is appropriated for higher education. Third, appropriations for higher education are responsive to fluctuations in the fiscal well being of the state. As the unemployment rate increases by one point the amount of monies appropriated for higher education declines by \$26.3 million. Fourth, while Republican governors can be seen to be supportive of corrections, their presence leads to a decline in appropriations for higher education of \$45.9 million. Finally, when the data is differenced none of the coefficients in the higher education model are significant.

The results from the 2SLS estimation suggest that there is in fact not a tradeoff between appropriations for corrections and appropriations for higher education. In fact the results in levels show that appropriations for higher education grow at a faster rate than corrections holding all other factors constant. However, before a tradeoff relationship between the two series can be ruled out it is necessary to test and see if in fact simultaneity between these two series is an appropriate assumption using the Durbin-Wu-Hausman test. The test results are reported in Table 6.4. The test reveals that when the data is in levels the null hypothesis that there are no systematic differences between OLS estimates and 2SLS estimates is rejected for both corrections and higher education. This implies that the two series are indeed a system of equations and that 2SLS is the appropriate methodology. Furthermore, when the data is differenced the OLS estimates for corrections and higher education are found not to be systematically different from the estimates derived from the simultaneous equation model. This implies that there is in fact no simultaneity bias in the OLS estimates of the equation for corrections and for higher education and explicit interdependence can be ruled out between the series. As such, seemingly unrelated regression is undertaken for the differenced data to determine

if the error terms of the two series are correlated. Thus, the relationship between appropriations for corrections and appropriations for higher education will be tested for a seemingly unrelated relationship.

Virginia – *Seemingly Unrelated Regressions*

Table 6.5 presents the results for the seemingly unrelated regression for the differenced data. In the model for corrections the coefficients associated with the size of the 18-24 cohort, the implementation of repeat offender legislation, and the implementation of sentencing guidelines are all significant and in the hypothesized direction. The model is able to account for 61 percent of the variation and diagnostic tests reveal that autocorrelation is not a problem.⁹ The results suggest that on average an increase in the size of the 18-24 year old cohort by one from the previous year leads to an increase in the amount of appropriations for corrections from the previous year of \$1,050. In addition, the implementation of harsher penalties for repeat offenders leads to an increase in appropriations of \$21 million from the previous year. Finally, the implementation of sentencing guidelines leads to an average increase of \$22.8 million from the previous fiscal year, holding all other factors constant. For higher education, only the budgetary pie is found to be a significant factor.¹⁰

⁹ At the sixth lag, the Ljung-Box Q stat is insignificant (.0615) and the Q stat generated from the Portmanteau test for white noise is insignificant (.3071). Furthermore, since SUR is a GLS procedure heteroskedasticity is not a problem.

¹⁰ Since higher education is second differenced, the interpretation of the coefficient of .0054 is difficult to interpret in any meaningful fashion.

Table 6.5: Seemingly Unrelated Regression, Virginia

	Corrections		Higher Education	
	Coefficient	z-value	Coefficient	z-value
Constant	-0.30556	-0.03	-20.7354	-1.54
Pie	-0.00338	-0.33	0.053967	**2.04
Cohort	0.00105	**3.75	0.000331	0.57
Enroll	--	--	0.001720	0.88
Violent Crime	0.10400	0.81	--	--
Unemployment	-2.4945	-0.84	-3.49238	-0.51
Governor	-8.6817	-1.08	1.872707	0.14
Mandatory Minimums	3.16106	0.44	--	--
Repeat Offender	20.9648	**2.29	--	--
Sentencing Guidelines	22.8119	**3.27	--	--
Truth in Sentencing	13.7597	1.41	--	--
R ²	0.6673		0.1641	

Note: Corrections and Higher Education in millions; Data differenced; ** significant at .05

In levels it was found that there is no tradeoff between appropriations for corrections and appropriations for higher education. In differences an explicit interdependence has been ruled out, but it is still possible that the residuals of the single large regression analysis are significantly correlated. If the residuals are significantly correlated it can be concluded that what is driving the unexplained portion of the models are a function of similar processes or variables. If they are not correlated, we can then assume that the two series are unrelated and being driven by separate processes. Table 6.6 presents the results of the Breusch-Pagan test for the SUR. The test shows that the residuals from the two equations are correlated at a value of .2887. Not only is the correlation positive, suggesting that there is not a seemingly unrelated tradeoff relationship, but the relationship is also insignificant. In conjunction with the 2SLS results in levels, it can be inferred that there is not a tradeoff between appropriations for

corrections and appropriations for higher education in Virginia between fiscal year 1970 and fiscal year 1999.

Table 6.6: Seemingly Unrelated Results (Breusch-Pagan Test), Virginia

	Correlation	Chi-square	Probability
Differenced-Differenced	0.2887	2.2151	0.1335

This chapter has explored the impact of a variety of exogenous factors and policies on appropriations for corrections and appropriations for higher education in Virginia. Estimation procedures followed two distinct paths, one for the data in levels (2SLS) and one for the data in differences (SUR). A comparison of these two paths is shown in Table 6.7. This figure shows the sign of the coefficient and the p-values in parentheses for all those coefficients that have p-values less than .125. Convergence between the results occurs when the two paths generate significant coefficients with the same signs. For corrections convergence occurs for the implementation of sentencing guidelines. Both paths show that implementation led to an increase in appropriations for corrections. Only one of the paths produces coefficients with p-values less than .125 for higher education, the budgetary pie, the political ideology of the governor, and the implementation of repeat offender legislation. In addition, the signs of the coefficients associated with the size of the 18-24 year old cohort are in conflict with one another. Finally, for higher education, only one of the paths produces coefficients with p-values less than .125. These factors are corrections, the budgetary pie, the size of the 18-24 cohort, the unemployment rate, and the political ideology of the governor. In order to

make sense of these results, they will be directly related to the statistical hypotheses laid out earlier in this dissertation.

Table 6.7: Triangulation of Estimates in Virginia

Corrections	2SLS (levels)	SUR (differenced)
Higher Education	+ (.001)	
Pie	- (.079)	
Cohort	- (.109)	+ (.000)
Violent Crime		
Unemployment		
Governor	+ (.019)	
Mandatory Minimums		
Repeat Offender		+ (.022)
Sentencing Guidelines	+ (.026)	+ (.001)
Truth in Sentencing		
Higher Education	2SLS (levels)	SUR (differenced)
Corrections	+ (.000)	
Pie		+ (.041)
Cohort	+ (.000)	
Enrollment		
Unemployment	- (.012)	
Governor	- (.015)	

Note: +/- symbols are the signs of coefficients and p-values are in parenthesis ($\leq .125$).

The results in Virginia reveal: (1) that there is not a tradeoff relationship between corrections and higher education appropriations. Instead, appropriations for corrections grows at a rate that is slower than higher education holding all other factors constant. (2) Exogenous factors create policy relevant conditions that impact budgetary allocations. First, the presence of a Republican governor leads to increased appropriations for corrections and decreased appropriations for higher education. Second, an increase in the size of the 18-24 year old cohort leads to increases in appropriations for both corrections and higher education. Due to the fact that this variable is not significant at the .10 level

for corrections, it is more plausible that increases in the size of the cohort lead to increases in appropriations. Third, appropriations for higher education increase during times of fiscal well being (as the unemployment rate declines). Finally, several factors found to be significant predictors of appropriations in other states are not significant in Virginia. This includes the violent crime rate and unemployment for corrections and the size of enrollment for higher education. (3) An expanding budgetary pie leads to increases in appropriations for higher education. The budgetary pie is not a significant predictor of appropriations for corrections. (4) The implementation of specific public policies significantly impacts appropriations for corrections. The implementation of sentencing guidelines and resultant 'harsher' sentences leads to an increase in appropriations. Furthermore, the implementation of a repeat offender policy leads to increases in appropriations for corrections. While truth in sentencing was not a significant predictor of appropriations, the true impact of this recent policy change may be felt sometime in the future. Assuming that commitment rates remain relatively constant and offenders are mandated to serve longer sentences, appropriations for corrections will have to increase to meet a growing demand in the future.

To gain further insights into the meaning of the empirical results, predicted values are generated for each independent variable for FY 1972-1999. Table 6.8 presents the relative contribution of each independent variable and the predicted and actual appropriations for corrections in millions of dollars. These calculations are made using the data in levels.

The constant term suggests that absent any other influences corrections would receive \$51 million. Beyond the constant those factors that play a large role in

determining the size of appropriations are higher education, the size of the 18-24 year old cohort, the violent crime rate, and the implementation of sentencing guidelines. The majority of the growth in appropriations for corrections is a function of corrections responding to increases in appropriations for higher education. Furthermore, while the size of the 18-24 cohort and the violent crime rate have a large impact, their values remain relatively constant over the range of years presented. Between FY 1972-1999 the range of values associated with the cohort is -\$300 million to -\$369 million, or a difference of \$69 million. Similarly, the range for the violent crime rate is \$132 million to \$176 million, or a difference of \$44 million dollars. Thus, while these factors have a large magnitude the two series do not fluctuate very much over the time period under study and their effect on changes in the size of appropriations for corrections is statistically insignificant. In contrast, the implementation of sentencing guidelines led to increases in appropriations for corrections in the 1990's.

Policies implemented in the 1990's dramatically influenced the amount of monies appropriated for corrections. Appropriations for corrections attributable to sentencing guidelines are \$71 million and for truth in sentencing \$33 million. In conjunction with a Republican governor, these three factors are responsible for over \$130 million of the predicted \$618 million in FY 1999. The implementation of these policies brought with them longer sentences and hence placed an additional burden on correctional resources. Similar to California, the implementation of these policies corresponds to a period when the violent crime rate was on the decline. For example, in FY 1998 and 1999 the violent crime rate was 326 and 314 per 100,000 inhabitants, respectively, in Virginia. If this rate was to increase and all other factors were to remain constant, the impact on

appropriations would be a dramatic rise in appropriations for corrections. For example, if the rate in FY 1999 were to have been at Virginia's high (380) during the time of study, appropriations for corrections would have been \$633 million rather than \$618 million. Likewise if the rate in FY 1999 had been equivalent to the rate found in Michigan in the late 1980's (800), appropriations would have risen to \$818 million and if the rate was equivalent to the rate found in California in the early 1990's (1,000), appropriations would be \$919 million. These scenarios reflect that the sentencing policies have been implemented in Virginia during a time when some of the factors that may lead to further increases in appropriations for corrections have been declining. This is true for both the violent crime rate and for the unemployment rate. Therefore, Virginia faces a potential problem similar to that found in California. If the crime rate and/or unemployment were to increase, an additional strain would be placed not only on the correctional system, but on the state budget as well.

Table 6.8: Predicted Values for Appropriations for Corrections (in millions)

FY	Constant	Higher Education	Budgetary Pile	Cohort	Governor	Unemployment Rate	Violent Crime	Mandatory Minimums	Repeat Offender	Sentencing Guidelines	Truth In Sentencing	Corrections Predicted	Corrections Actual
1972	51.329	69.523	-0.034	0.000	33.442	2.710	0.462	15.682	-8.236	70.930	33.442	-2.239	13.653
1973	51.329	80.387	-4.367	-310.319	33.442	10.026	139.396	0.000	0.000	0.000	0.000	11.116	17.615
1974	51.329	88.135	-6.018	-309.204	33.442	9.755	159.684	0.000	0.000	0.000	0.000	27.122	18.342
1975	51.329	104.076	-4.424	-318.036	33.442	9.755	153.557	0.000	0.000	0.000	0.000	29.699	27.249
1976	51.329	118.351	-8.378	-327.886	33.442	12.193	164.694	0.000	0.000	0.000	0.000	43.745	28.551
1977	51.329	135.199	-2.589	-340.000	33.442	17.342	175.774	15.682	0.000	0.000	0.000	86.178	51.803
1978	51.329	141.091	-9.244	-349.236	33.442	15.987	142.026	15.682	0.000	0.000	0.000	41.077	58.525
1979	51.329	179.029	-7.498	-356.226	33.442	14.361	133.856	15.682	0.000	0.000	0.000	63.976	70.794
1980	51.329	187.262	-10.788	-362.426	33.442	14.632	132.173	15.682	0.000	0.000	0.000	61.307	75.763
1981	51.329	221.001	-7.768	-362.834	33.442	12.735	138.911	15.682	-8.236	0.000	0.000	94.261	96.519
1982	51.329	234.046	-6.658	-362.731	33.442	13.548	141.794	15.682	-8.236	0.000	0.000	112.215	107.392
1983	51.329	256.896	-5.348	-368.674	33.442	16.529	148.478	15.682	-8.236	0.000	0.000	140.097	146.981
1984	51.329	267.482	-16.830	-366.878	33.442	20.864	142.635	31.364	-8.236	0.000	0.000	155.173	150.673
1985	51.329	296.655	-9.447	-366.952	0.000	16.529	135.015	31.364	-8.236	0.000	0.000	146.257	162.054
1986	51.329	319.163	-19.199	-364.951	0.000	13.548	136.427	31.364	-8.236	0.000	0.000	159.444	178.145
1987	51.329	365.407	-11.627	-359.933	0.000	15.174	135.991	31.364	-8.236	0.000	0.000	219.470	204.012
1988	51.329	381.994	-22.862	-352.749	0.000	13.548	141.225	31.364	-8.236	0.000	0.000	235.614	209.655
1989	51.329	430.532	-12.538	-357.818	0.000	11.381	136.128	31.364	-8.236	0.000	0.000	282.142	250.822
1990	51.329	458.784	-11.025	-355.632	0.000	10.568	138.088	31.364	-8.236	0.000	0.000	315.240	289.701
1991	51.329	441.036	5.900	-353.793	0.000	10.568	144.232	31.364	-8.236	0.000	0.000	322.400	322.621
1992	51.329	401.832	-8.835	-351.173	0.000	11.652	161.819	31.364	-8.236	0.000	0.000	289.753	324.300
1993	51.329	390.444	-12.720	-341.924	0.000	15.987	172.239	31.364	-8.236	0.000	0.000	298.483	328.153
1994	51.329	397.344	-19.578	-337.164	0.000	17.342	173.023	31.364	-8.236	70.998	0.000	376.422	359.522
1995	51.329	414.337	-7.921	-333.297	0.000	13.819	171.783	31.364	-8.236	70.998	0.000	404.177	420.674
1996	51.329	422.164	-18.438	-326.709	33.442	13.277	165.091	31.364	-8.236	70.998	0.000	434.284	434.587
1997	51.329	476.599	-19.670	-320.649	33.442	12.193	166.820	31.364	-8.236	70.998	33.442	527.633	487.658
1998	51.329	515.206	-5.142	-315.715	33.442	11.922	157.519	31.364	-8.236	70.998	33.442	576.129	511.928
1999	51.329	587.880	-37.235	-315.415	33.442	10.839	159.341	31.364	-8.236	70.998	33.442	617.749	573.484

CHAPTER 7

Budgets themselves represent the endgame of a struggle for scarce resources that reflect government priorities. Public budgeting itself is characterized by a number of claimants who make requests for resources and conserving forces in the form of political actors who wish to exercise control over the budgetary process and authoritatively ration resources (Schick 1988). Requests for resources are made in attempt to address societal needs and problems. However, state governments operate in an environment of limited revenue and thus are incapable of addressing all needs and demands for resources. Potentially states could increase taxes to meet demands or overspend and incur budgetary deficits, but neither is a popular alternative for elected representatives. Therefore, budgets represent the politics of choice in an arena of fiscal constraints (Rubin 2000). In this context budgets represent a culmination of a process of competition whereby choices are made each year to allocate resources to diverse interests and priorities. This dissertation has focused on the factors that are determinants of appropriations for budgetary categories. Specifically, it focused on those factors that determine the amount of monies appropriated for corrections and higher education in California, Michigan, and Virginia. These two budgetary categories represent components of a state's budget where there is not a legislative or constitutional mandate requiring a particular level of spending. Studying two discretionary budget categories allows for an examination into the ways resources are allocated to diverse interests and claimants and a way to look at potential tradeoffs between budgetary categories.

One of the hypotheses examined in this dissertation was whether or not there was a tradeoff between corrections and higher education. To test this hypothesis a series of equations was estimated and where this methodology was deemed inapplicable a seemingly unrelated regression equation was estimated. Despite the multitude of claims by scholars and pundits that the recent growth in corrections has come at the direct expense of higher education, the empirical results in this study generated mixed conclusions.

In California it was revealed that the relationship between appropriations for corrections and appropriations for higher education is not one of a system of simultaneous equations. Instead, the relationship is recursive with corrections found to be a determinant of appropriations for higher education, while higher education was found not to be a determinate of appropriations for corrections. An examination of the unidirectional relationship did find that corrections is growing at a faster rate than higher education when all other factors are held constant. Similarly, in Virginia the notion of a tradeoff between the two budgetary categories was ruled out. Simultaneous equation estimation revealed that higher education is growing at a faster rate than corrections when all other factors are constant. These results give some credence to Domke, Eichenberg, and Kelleher's (1983) assertion that "direct priority setting - the trading off of one program against the other - is rare or nonexistent in democratic governments" (20). In contrast, the results in Michigan, for the data in levels, suggest that there is a tradeoff between appropriations for corrections and appropriations for higher education. It was found that corrections and higher education represent a system of equations where corrections receives on average 104.8 percent of the amount appropriated for higher

education and higher education receives only 88 percent of that appropriated for corrections. Therefore, it can be seen that in Michigan appropriations for corrections is growing at a faster rate than appropriations for higher education.

The results of tests for the existence of an explicit tradeoff between corrections and higher education are somewhat muddled. Nevertheless, by its very nature the activity of budget setting is characterized by an implicit tradeoff relationship. This point is reinforced by Rubin (2000) who states that all “[a]ll budgets contain tradeoffs” (132). This implies that every dollar spent towards one budgetary category truly represents an opportunity cost for dollars that could be spent elsewhere. Given that state revenues and the amount of monies available for state expenditures are limited; state governments are forced to make decisions about what they consider to be priorities. Those arenas that are viewed as the most valued priority are given monies that potentially could be used for other programs and activities. While not necessarily an explicit tradeoff, increases in appropriations for corrections from a state’s general fund could be re-designated to alternative means (e.g., higher education). This begs the question, how are priorities set and what other factors lead to increases in appropriations for specific budgetary categories? One way to understand these processes is to look at the idea of policy windows and more specifically at changes that occurred in the sentencing policies and practices of corrections.

Policy Windows and Changes in Correction's Policy

Policy changes for corrections have come in two separate waves in California, Michigan, and Virginia. The first wave of changes dealt with determinate sentencing, mandatory minimums, and repeat offender legislation and occurred between the late 1970's through the beginning of the 1980's. The second set of changes introduced Three Strikes, truth in sentencing, and sentencing guidelines during the 1990's. The various policies that were implemented in these three states, and focused on in this dissertation, are presented in Table 7.1. Each of these states implemented a wide range of correctional reforms that dramatically altered the way that offenders were viewed and sentenced. These reforms resulted in increased prison populations and the need for additional resources to support an increasing demand.

Table 7.1: Summary of State Reforms (dates implemented)

	Mandatory Minimums	Sentencing Guidelines	Recidivism (Three Strikes)	Truth In Sentencing	Parole Mechanisms	Good Time Modifications
California	1982	---	1982 1994	---	1977	---
Michigan	1977 1978	1999	---	1998	1980	1985
Virginia	1975	1991	1979	1995	---	---

The two waves of policy reforms were implemented during times when a confluence of factors arose that served to open windows of opportunity for change and reform. Policy windows become open when there are changes in the political stream

(change in administration), or problems arise that need solutions. As such, policy windows are periods in time that provide an opportunity for action on given initiatives. These moments present policy entrepreneurs with a chance to match (couple) their policies to the ideology of the political stream or to problems that need solutions (Kingdon 1995). Rubin (2000) notes that one way of dealing with budgetary competition “is to try to raise the priority of one’s spending proposal, and one way of increasing the priority of projects or programs is to represent them as solutions to crises or emergencies” (135). The policy reforms to the criminal justice system that occurred between 1971 and 2000 can be explained within this framework.

The first wave of policies was pushed through during a time when the rehabilitative or medical model came under attack. Martinson’s (1974) seminal work, which reviewed 200 prison programs, found that ‘nothing works’ (Clark 1994). This led critics to question the philosophical foundations of indeterminate sentencing, particularly the notion of rehabilitation. Simultaneously, there was a coalition of interests in opposition to indeterminate sentencing on the grounds that there was excessive disparity among sentences in presumably similar cases and that offenders often were released before their maximum sentences were reached. The first concern centered on the possibility that discriminatory sentencing practices based upon the race of the offender were taking place. The second concern focused on the fact that parole boards would often release prisoners well before maximum sentences were reached (Blumstein 1984, 130). The argument was put forth that these offenders did not serve time commensurate with the offense committed. As such, states moved away from indeterminacy to a system of determinate sentencing that had at its foundation the idea of retribution. Don

Gottfredson, commenting on the move towards determinate sentencing, states that “sentencing purposes have shifted from an emphasis on utilitarian aims, particularly treatment, toward a greater focus on deserved punishment, on the proportionality of sanctions to harms done, and on equality” (Gottfredson 1984). These policies were implemented at a time when policy windows were open as Republican leaders, who were tough on crime, were in office and a problem with the status quo was identified.

The second wave of policy reforms was implemented during a time when the violent crime rate was rising in most states and the states under study had a Republican governor in office. During the 1980’s the violent crime rate began to rise, reaching a pinnacle in the early 1990’s. In California the violent crime rate rose from under 800 violent offenses known to police per 100,000 inhabitants in the mid 1980’s to over 1,000 by 1994. This fact combined with Republican governors in office in the early and mid 1990’s created an environment for change. Politicians campaigned on ‘tough on crime’ platforms and implemented reforms when elected that increased sentences for repeat offenders and forced most offenders to serve a significant portion of their mandated sentences.¹ Once again a window of opportunity was opened and policies were implemented that increased the severity of sentences and ultimately increased the demand for correctional resources.

Correctional policies were being passed at precisely the same time that demand was increasing for state services. Exogenous factors, in the form of policy relevant conditions, created an environment for budgetary expansion. It was found that

¹ During this time period politicians painted a picture of society that was under threat from criminals. Since rehabilitation was not effective the only solution was to lock up offenders and ‘throw away the key.’ This message was reinforced by intense rhetoric and the use of imagery (e.g., Polly Klaus case) to define the problem.

appropriations for corrections are responsive to certain exogenous factors. In all three states the presence of a Republican governor led to increases in appropriations for corrections. Additionally, in California appropriations for corrections were responsive to increases in the violent crime rate and in Michigan appropriations were responsive to an increase in the size of the 18-24 year old cohort. Therefore, the same factors that were instrumental in opening windows of opportunity for new policies were also associated with creating windows of opportunity for budget actors. The states responded to the increases in demand by appropriating more for corrections. In this light the same mechanisms that are used to understand policymaking are useful for understanding budgeting. Therefore, state budgets were responsive to two forces at the same time. They were responsive to exogenous demands from the environment and to resource demands placed upon the system by new policies.

At the end of the 1990's budgets for corrections continued to rise in California, Michigan, and Virginia. The policies enacted as 'tough on crime' placed additional burdens on the budgetary resources of the states. However, many of these policies were implemented during a time when environmental factors that act as policy relevant conditions for the expansion of the correction's budgets were declining and states were experiencing fiscal good times. For example, in California the violent crime rate was roughly 625 in 1999 in comparison with 1,100 in 1992. In Michigan, the violent crime rate was at 575 in 1999 down from over 800 in the early 1990's. Likewise the unemployment rate was under four at the end of the 1990's well under the double-digit rate found in the 1980's. Finally, in Virginia the violent crime and the unemployment rate were also on the decline in the late 1990's. If these policy relevant conditions, which

represent a decline in the demand for corrections, were to revert to levels found at the end of the 1980's and early 1990's states potentially could be faced with a new fiscal crisis. The implementation of corrections' policies has increased the likelihood of commitment to prison for those arrested and the time served by those sentenced. This has dramatically increased the demand for additional resources.² If the unemployment rate and/or the violent crime rate were to increase in these states, demand for additional resources would increase even more. For example, a simulation in this study found that in California if the violent crime rate in 1997 had been the same rate as in the early 1990's corrections would have risen from \$4.7 billion to roughly \$6.0 billion, *ceteris paribus*. Therefore, at the start of the new millennium states find themselves at a crossroads. How will they respond to pressures of prison overcrowding and rising prison costs? Will states undergo another round of prison building? Or will states respond by once again changing their approach to sentencing?

Policies as a Pendulum

As Kingdon (1995) has suggested policies gain prominence at times when three streams (political, problems, and policy) come together. During the late 1970's and again in the mid to early 1990's criminal justice policies rose on the agenda and determinate sentencing and 'tough on crime' policies were implemented in response to a problem. In order to gain a better understanding of these changes and link this to the position that

² For many of the policies implemented during this time period it is still too early to realize the full impact of the reforms. This includes the implementation of Three Strikes in California and truth in sentencing in Michigan and Virginia. The full effects of these programs may be for an even greater demand for resources.

state governments find themselves in, a metaphor equating policy change and a pendulum clock will be constructed.

A grandfather clock is made up of a collection of weights, cogs, pulleys, and a pendulum. These apparatus work together to keep an accurate account of time. When the time on a pendulum clock is inaccurate it is adjusted by moving the pendulum bob up or down to shorten or lengthen the path of the pendulum. If the clock is drastically off the mark the bob must be moved a great distance, whereas if it is off a little it must only be moved only a short distance. After the bob has been adjusted it may take up to a full day to realize that the clock is still not keeping the correct time.

Similar to the bob in a pendulum, policies are often introduced to change the status quo (present time) when it is perceived that there is a problem. In the case of corrections, a move away from indeterminant sentencing was an attempt to correct perceived deficiencies associated with both the philosophical foundation and practice of sentencing. This shift was a radical departure from past practices. The question remains did the policy changes go to far? Like the shift in the bob, the full impact of policy changes cannot be known for sometime. While policymakers can anticipate the consequences of changes there are often unintended consequences and projections and forecasts of impacts are often inaccurate. In the case of sentencing the consequence of the reforms was a massive growth in the number of inmates in state prisons. Between 1970 and 1999 the number of offenders in state prisons grew from 175,000 to over 1.2 million. This rapid growth placed a tremendous strain on the correctional resources that existed. In response, states were forced to increase the number of prisons, personnel, and resources to support an expanding system. During this period states faced overcrowding

of their prisons and what some have called a crisis in corrections. Confronted with an ever-expanding prison system and the potential for a fiscal crisis many states are moving away from tougher criminal laws by reducing the stringency of their statutes and moving back towards the notion of rehabilitation. In a sense, they are readjusting the sentencing clock.

Intermediate Sanctions

As discussed above recent policies have led to a very rapid expansion of the prison system. As a potential solution to this problem many reformers are advocating the use of intermediate sanctions. Morris and Tonry (1990) argue that prison crowding and the resultant fiscal pressure requires attention. They contend that what is needed is a range of meaningful sanctions between probation and prison. This point is reinforced by von Hirsch, Wasik, and Greene (1989) who state that "[w]ith prisons overfilled and the costs of new prison construction rising, the need has become apparent for credible sanctions that can be administered in the community" (597). The range of intermediate sanctions includes: restitution, community service, fines, residence in community detention centers, house arrest, and inpatient and outpatient treatment for drug and alcohol. Wood and Gramsmick (1999) maintain that intermediate or alternative sanctions are attractive because: (1) they are believed to reduce prison overcrowding by channeling offenders out of prisons and into community based punishments; (2) the level of risk some offenders represent is too high for probation, but not great enough for prison; (3) alternative sanctions are typically less expensive than imprisonment; and (4) alternatives presumably offer offenders a better chance at rehabilitation. Both California and Virginia

are presently experimenting with policies that move sentencing back towards the ideal of rehabilitation.

In California a recent referendum was passed that mandates treatment rather than prison for many drug offenders. The Substance Abuse and Crime Prevention Act (Proposition 36) was passed by 61% of California voters on November 7, 2000. This initiative allows first and second time nonviolent, simple drug possession offenders the opportunity to receive substance abuse treatment instead of incarceration. It has been projected that this initiative, which went into effect on July 1, 2001, will save California taxpayers \$1.5 billion over the first five years. According to the State Legislative Analyst's Office, the Substance Abuse and Crime Prevention Act will divert approximately 25,000 non-violent drug possession offenders per year into drug treatment instead of prison. By reducing the number of offenders in the state correctional system operating costs for corrections will be reduced by between \$200 and \$250 million. Furthermore, parolee supervision caseload will be reduced by as much as 9,500 parolees. Finally, it is projected that this policy change will reduce the need for state prison beds needed for drug offenders by between 10,000 and 12,000. This will result in the delay of construction of additional prison space and lead to a one-time savings in deferred or avoided prison construction costs of \$475 and \$575 million (California Campaign for New Drug Policies).³

Virginia has also recently reevaluated their sentencing practices. In conjunction with the introduction of truth in sentencing, the Virginia General Assembly charged the Virginia Criminal Sentencing Commission with the task of studying the feasibility of placing 25 percent of drug, fraud, and larceny offenders in alternative (non-prison)

³ Currently the state is expected to pay for construction of another new prison by 2003.

sanctions by using an empirically based risk assessment instrument. The instrument is used to identify offenders who have the lowest probability of being reconvicted of a felony crime at the time of sentencing. The risk assessment instrument is presently being pilot tested in six judicial circuits in Virginia. The Virginia Criminal Sentencing Commission (1999) feels that the “risk assessment instrument can be viewed as an important component to help maximize the utilization of alternative punishments for nonviolent offenders while minimizing threat to public safety and reserving the most expensive correctional space for the state’s violent offenders” (77). Risk assessment and diversion are an option only for offenders who do not have any current or prior convictions for violent felonies or offenders who sell an ounce or more of cocaine.

A recent evaluation of the development and impact of the risk assessment instrument conducted by the National Center for State Courts finds that the instrument is effective in predicting recidivistic behavior and thus identifying ‘good’ candidates for diversion. Furthermore, the benefit/cost component of their analysis finds that if the program were to be implemented statewide the net societal benefit would be between \$2.9 and \$3.6 million (Ostrom et al. 2001). This program is illustrative of a shift towards policies that are seeking alternative sanctions that will result in less offenders being committed to prison and ultimately result in cost savings for state governments.⁴

⁴ New York State has also recently expressed a desire to move away from harsh determinate sentences. New York Governor George Pataki has proposed a reform of the Rockefeller drug laws. These laws are among the most severe in the United States. For example, a person convicted of selling more than two ounces, or possessing more than four ounces of cocaine or heroine must be sentenced to a minimum of 15 years in prison. Pataki’s proposal would allow an appeals court to reduce prison terms by up to a third for first-time, nonviolent drug offenders, expand drug treatment alternatives, and allow trial judges, with the consent of the prosecutor, to divert some drug defendants to substance abuse programs instead of prison.

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