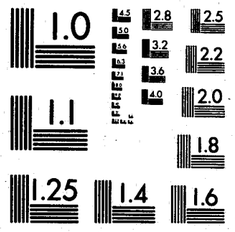

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THE VARIANCE OF CRIME RATES:

NATIONAL, STATE, AND LOCAL CONTRIBUTIONS

A Report Prepared For

the National Institute of Justice

by

Kenneth W. Allen

ABSTRACT

Crime rates can be affected by local, state or national forces. This paper examines the amount of the variance in crime rates between 1967 and 1980 attributable to each level. It concludes that, during the period examined, over 50% of the combined cross-sectional and temporal variation in total Part I crime rates is attributable to national-level forces. Although the paper is limited to examination of the loci of the forces, it promotes the inference that policy analysis could profitably focus on national-level forces in the future.

SUMMARY

Research on the causes of crime has often focused on the variables which produced the highest correlations. These are frequently attitutdes upon which deliberate public policy has little effect. An alternative would be to seek variables which can be more easily affected by public policy even though their connection with crime is less direct. This approach should not be confused, however, with one which asserts that causal analysis is irrelevant to policy analysis. Variables sometimes far removed from a crime are no less causal for being indirect.

Before looking for such causes of crime, it is helpful to search for their loci. That is the mission of this paper. Crime rates can be affected by local, state, or national forces. This paper examines, through several methods, the amount of the variance in crime rates between 1967 and 1980 attributable to each level. In each case, the methodology provides an estimate of the minimum proportion attributable to national-level forces. This minimum proportion varies from crime to crime and with the sizes of cities used in the sample. Furthermore, each of the methods of analysis raises its own questions and has its own limitations.

Even this conservative approach allows several broad conclusions: During the period examined, over 50% of the combined cross-sectional and temporal variation in total Part I crime rates was attributable to national-level forces. Over 60% of the variance in crime rates over time was attributable to national-level forces. The influence of state-level forces, in contrast, was negligible, except in the case of voter vehicle theft (in which the influence of national forces was negligible.)

It can be reasonably concluded from the research that future searches for sources of crime which can be influenced by public policy might profitably look at national-level forces, even though such a focus will be counter-intuitive for some local policy-makers, and the trends visible in the data suggest no obvious simple relationships.

ACKNOWLEDGEMENTS

As much as any research project can be, this was a one-person project. There is not even a typist to acknowledge. Nevertheless, the project would have been utterly impossible without a great deal of social, intellectual, and financial support which no one had to give, but someone always did. The National Institute of Justice financed the project under its Visiting Fellow program, and its employees somehow always managed to give help when it was needed while never interfering.

In particular, I would like to thank Dr. Bernard Gropper, who, as grant manager saw that I met administrative requirements, while simultaneously insuring that those requirements did not become burdensome. He also did his best to make me comfortable in the unsettled circumstances my temporary employment as a Visiting Fellow made inevitable. Dr. Edward Zedlewski proved always ready to stop and enthusiastically discuss the most abstruse and mind-numbing methodological problems I could raise, no matter how pedestrian they might seem to him. Joel Garner was always too busy for even the shortest idle conversation, but never too busy help me find out how to get needed information. Brian Wiersema proved himself a technical wizard while cheerfully preparing and transmitting data from the Inter-University Consortium for Social Research in a format I could use easily. Kyle Kramer made using "her" library a pleasure. Anne Schmidt shared her office with good grace and provided a wealth of information about the Washington environment. Betty Chemers stood ready to slay any red tape dragon with a weapon of charm, and made all of NIJ's interns and fellows feel their work was as important as anyone's.

Obviously, I can blame none of these people for my own shortcomings, which I have instead (no doubt) incorporated in the paper which follows.

CONTENTS

Chapter I
Introduction

A decade ago, James Q. Wilson documented the efforts of the most widely respected criminologists to examine the causes of crime.[1] Unfortunately, Wilson found that such research had resulted in little that was useful for making public policy. He then proceeded to the conclusion that causal analysis by its very nature was destined to have little policy applicability. Although by no means all researchers who studied crime shared Wilson's views,[2] the consequences of their widespread acceptance in certain circles have been profound.

In the absence of a clear understanding of causal relationships, policy-makers are left with little to guide action except the dictates of public relations. If cause and effect are unknown, the steps which will have an effect must also be unknown. Nevertheless, policy recommendations will be made and policy steps will be taken. It is one of Wilson's complaints that in the absence of indications of what should be done arising from their research, social scientists have made recommendations based on beliefs derived from the general climate of opinion in their intellectual and social circles.[3] Wilson recommends as an alternative, that policy analysts concentrate on a few policy instruments available to a government, which can "manage to a degree money, prices, and technology, and...can hire people who can provide within limits either simple (e.g., custodial) or complex (e.g., counseling) services....A policy analyst would ask what feasible changes in which of these areas would, at what cost (monetary and non-monetary), produce how much of a change in the rate of a given crime."[4]

Although Wilson's own emphasis in the mid-seventies seems to have been on deterrence (a phenomenon obviously dependent upon a complex set of causal relationships),[5] probably the most influential set of policy recommendations arising as a logical extension of Wilson's remarks concern selective incarceration.[6] The influence has not been confined to the generation of a lot of studies. A number of states and local jurisdictions have initiated policies intended to implement selective incapacitation. Recommendations in this area are attractive to many actors in criminal justice system because they offer not just a guide to action, but a guide to action appropriate for criminal justice agencies. Broader proposed causes, such as poverty, unemployment, and family instability, even when they suggest a course of action, often require actions beyond the purview of criminal justice agencies--the agencies normally thought of as the ones which should "fight" crime.

Rational proponents of the kinds of policy recommendations based on Wilson's perspective do not assert they are panaceas. A typical view of selective incarceration is that, although the deterrent value is unknown and no rehabilitative effect is claimed, at least criminals who are incarcerated cannot commit crimes while they are in prison. Needless to say, even agreement along these lines leaves ample room for criminologists, policy-makers, and the general public to argue about just who should be

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[1] James Q. Wilson, "Crime and the Criminologist," in Seymour L. Halleck et al, eds., The Aldine Crime & Justice Annual, 1974, (Chicago, Ill.: Aldine Publishing Company, 1975.)

[2] See, for instance, Daniel Glaser, "A Review of Crime-Causation Theory and Its Application" in Norval Morris and Michael Tonry, eds, Crime and Justice: An Annual Review of Research, Volume I (Chicago, Ill.: University of Chicago Press, 1979.

[3] Wilson, 1974, pp. 462-463.

[4] Wilson, p. 460.

[5] See, for instance, his remarks in Chapter 8, "Courts and Corrections" in the 1975 edition of James Q. Wilson, Thinking About Crime (New York, New York: Basic Books, Inc., 1975), pp. 162-182.

[6] The list of studies is extensive and growing. For a bibliography, see Jacqueline Cohen, "Incapacitation as a Strategy for Crime Control: Possibilities and Pitfalls" in Michael Tonry and Norval Morris, eds., Crime and Justice: An Annual Review of Research, Vol. 5 (Chicago, Ill.: University of Chicago Press, 1983).

incarcerated and how to write laws which will not give life sentences to chronic but petty thieves.

The complaints about causal analysis do not constitute a real rejection of the notion of causality, or even of the use of causal analysis in deciding what steps policy-makers can take. It is merely an assertion that other causal analyses have not produced results that suggest effective action criminal justice agencies (or perhaps any agencies) can take. In endorsing policies of selective incarceration, Wilson and his followers have, in fact, merely seized upon one obvious causal relationship and asserted that, in the absence of anything better, it suggests one way to combat crime.

There are some disadvantages to working only with the most obvious and immediate causal relationships. Although the worst problems and fallacies are usually avoided by serious researchers on criminal justice issues, they have a serious effect on policy debate.

A dearth of "obvious" causal relationships or of convictions about how they might be affected is usually not the primary limitation on policy-making in criminal justice. There are a lot of "obvious" causal relationships (usually involving punishment) that most people feel pretty certain about, and there are consequently many policy steps which most people feel would almost certainly have a significant impact on crime if only the steps could be taken. However, there are reasons they cannot be taken. Few people, for instance, would doubt that chopping off the hands of shoplifters would greatly reduce the incidence of shoplifting in the United States today. But there are many people left in American society (some of whom are not shoplifters) who believe that penalty is disproportionate to the crime, and there are other people who can be persuaded that a large population of handless people might prove to be an economic liability.

Similarly, our severe drug problems could be curtailed not by ineffectual efforts to interdict supply lines, treat those addicts who are willing to be treated and punish unrepentant

offenders who are caught, but by contamination of supplies. Introduction into illegal drugs of substances which, upon ingestion, produced immediate convulsions followed by agonizing death would quickly reduce the population of drug abusers by attrition if not through deterrence. Moreover, few innocent people would be hurt, and offenders would not overload our court calendars or overcrowd our jails and prisons, which would be left free for handless shoplifters.

The point is that there is a limit to the severity of the policies which the American people will support, even if the policies are effective. Refusal to consider any approaches to the control of crime except the most "obvious" approaches, which often involve ever more punitive policies, can simply be impractical as a long-term strategy for fighting crime. There are, of course, those who, in the face of the conviction that "nothing works" feel government should limit itself to facilitating whatever punishment which will provide them with the most thorough catharsis.[7] They don't need causal analysis.

Wilson stops short of recommending that no one engage in causal analysis. He concedes that academicians can quite properly continue to pursue causal analysis, but his remarks clearly imply that this is an ivory-tower activity. "Causal analysis attempts to find the source of human activity in those factors which themselves are not caused--which are, in the language of sociologists 'independent variables.' Obviously nothing can be a cause if it is in turn caused by something else; it would then

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[7]I do not wish to imply that Wilson is of the purely visceral school of crime fighting. He clearly recognizes that "we do not wish to reduce crime to the exclusion of all other considerations." Moreover, he does not bear a responsibility for those whose notion of policy is simple vengeance. I do believe dissemination of a more sophisticated view of the nature of causal relationships would make the arguments of such people less intellectually compelling, even if it had little effect on the emotional wellsprings of their recommendations. The quotation is from James Q. Wilson, ed., Crime and Public Policy, (San Francisco, CA: Institute for Contemporary Studies, 1983), p. 285.

only be an 'intervening variable.' But ultimate causes cannot be the object of policy efforts precisely because, being ultimate, they cannot be changed."[8]

The parody of causal analysis inherent in the above remarks is extreme. An occasional researcher may have imprudently used the phrase "ultimate cause," but the most recent ultimate cause with any intellectual respectability was probably Aristotle's Unmoved Mover.*

All of this could be dismissed as a quibble about some definitions, except that the conceptual confusion which allows some researchers or policy-makers to assert that they are eschewing causal analysis can lead to the neglect of important areas of research and, ultimately, important policy initiatives. The research undertaken in subsequent chapters of this paper cannot be justified without some understanding of where it fits within the larger enterprise of causal research, and thus within the smaller enterprise of policy research. It seems prudent to outline the perspective underlying the research, even though that perspective is not at all rare in most areas of political science. It will then remain only to note the applicability of that perspective to policy research in criminology.[9]

One classic discussion of causal analysis in political science highly relevant to the perspective of this study is contained in The American Voter.[10] The authors propose that the readers think in terms of a "funnel of causality" in which a

[8]Wilson, "Crime and the Criminologist," p. 459.

*In contrast, the Judeo-Christian God although usually conceived of as a creator, is believed to be moved by human actions (prayer, for instance), and thus does not qualify as an "ultimate" cause which "cannot be changed."

[9]I am by no means the first to have attempted to combat a naive view of the application of causal analysis to criminology. See, for instance, Daniel Glaser's discussion in Glaser, op. cit.

[10] Angus Campbell, Philip E. Converse, Warren E. Miller, Donald E. Stokes, The American Voter (New York, New York, John Wiley and Sons, Inc., 1960), pp. 24-32.

broad range of variables affect a smaller number which in turn affect a yet smaller number, and so on, until ultimately only a few have what may be conceived of as a direct effect on the phenomenon under study, the "dependent variable." In general, those variables near the mouth of the funnel will tend to have smaller measurable effects on the dependent variable than those which are close to the tip.

The funnel is far from the only metaphor available to illustrate the nature of causal connections. Because any independent variable is likely to have multiple connections to other independent variables, the relationships may be thought of as constituting a network.* Picking any one variable and following others it affects until the dependent variable is finally reached produces a chain. For convenience, people then speak of "independent," "intervening," and "dependent" variables. It must be emphasized, however, that the choice of words is only a convenience meant to reflect the role the variables are playing within a particular discussion. In fact any variable which has effects (which is to say, any variable at all) can be thought of as "independent," and any variable which is affected by others (which is to say, any variable at all) can be thought of as "dependent."

It follows that all variables are also "intervening" among other variables. Furthermore, the label of "direct" cause is only a convenient shorthand used to indicate that no further intervening variables will be considered. Between virtually any two variables, sufficient imagination can produce an intervening variable. As an example, pulling a trigger may be thought of as a direct cause of a gun firing, but of course all of the physical responses of the gun and all the chemical reactions which lead to the explosion of the firing powder intervene between this "direct" cause and its result. The biologist, physicist, and social scientist would each choose to study (and to ignore) different sets of variables in deciding "why" the gun fired.

*For anyone who has attempted to sort out the connections, the phrase "can of worms" comes to mind.

Each might also choose to concentrate upon a different variable in attempting to control the firing, but none need think of the variable he wants to affect as an "ultimate" cause. Note also that controlling the firing might, depending on the circumstances, be most easily done by controlling a variable far removed from what any of the scientists would think of as a "direct" cause, and some "direct" causes (e.g., the presence of oxygen) might be quite hard to control. What everyone would see as indirect is no less a cause, and no less important, for being indirect.

Policy analysis inevitably involves causal analysis. Any rational policy is the result of some causal analysis or assumptions, no matter how primitive. The trick is to find variables in the funnel of causality, or on the causal chain, which policy-makers can influence and which in turn have an appreciable influence on crime. In focusing on chronic offenders, criminal justice policy-makers have recently tried to pick causes which are far down the funnel. (The same, in fact, was true of the authors Wilson criticized. As he notes, "All made attitude formation a key variable."[11] Unfortunately, that focus does not accomplish enough to allow us to stop the search for other effective policies and variables they can influence. We are left for the moment with the same dearth of usable analysis that Wilson lamented, and with policies which even their authors assert are at best stop-gap measures and at worst impossible to adopt within the American legal and political system.

We need to improve, not abandon, causal analysis. But some very competent people have been frustrated in the search for "direct" and indirect causes which are amenable to policy direction. That was the stimulus for Wilson's comments.

Since it seems so hard to make progress under perspectives criminologists now have, it may prove helpful to back up a few steps. Instead of leaping right in to the search for causes, and

[11]Wilson, "Crime and the Criminologist," p. 458. It may be objected that attitude formation is not far down the funnel, but attitudes surely are.

immediately seeking the most "direct" causes possible, it may be helpful to gain some information about where causes come from, information which can be inferred from a broad examination of effects. The reader will discern that, having argued the need for causal analysis, I intend to engage in what could be called pre-causal analysis. In the long run that may suggest more productive approaches to the problem, even if they are indirect.*

In the following pages, instead of searching directly for causes, I have examined some patterns which are visible in certain of their effects. This approach is consonant with Daniel Glaser's observation that "the first step in trying to understand complex phenomena is to describe them and thereby to classify their variations."[12]

The following chapter consists of a broad look at trends in crime rates between 1967 and 1980. Chapter Three consists primarily of an attempt to apportion the variance in crime rates among national, state, and local levels. The results of that apportionment, and the limitations in the method which become apparent as it proceeds, highlight some distinctions between cross-sectional analysis and the analysis of change over time, and lead, in Chapters Four and Five, to a separate examination of changes over time. In all cases, this study emphasizes the sources of causal variables, and leaves the discovery of exactly what those variables are to other researchers. The utility, and

*The ancient alchemists futilely expended vast efforts in an attempt to create wealth by turning materials directly into gold. Those who stepped back a bit from the immediate endeavor learned things about chemistry which ultimately produced more wealth than the ancient alchemists could have dreamed of. This analogy is offered for the benefit of those who could not bear repetition of a not quite applicable and utterly exhausted cliche concerning forests and trees.

[12]Daniel Glaser "The Classification of Offenses and Offenders," in Handbook of Criminology, Daniel Glaser, ed. (Chicago, Rand McNally, 1974), Chap 2. Cited in Chaiken & Chaiken, "Crime Rates and the Active Criminal,", in Crime and Public Policy, James Q. Wilson, ed., Institute for Contemporary Studies, San Francisco, Ca., 1983.)

the frustrations, of this approach will be discussed in the Conclusion.

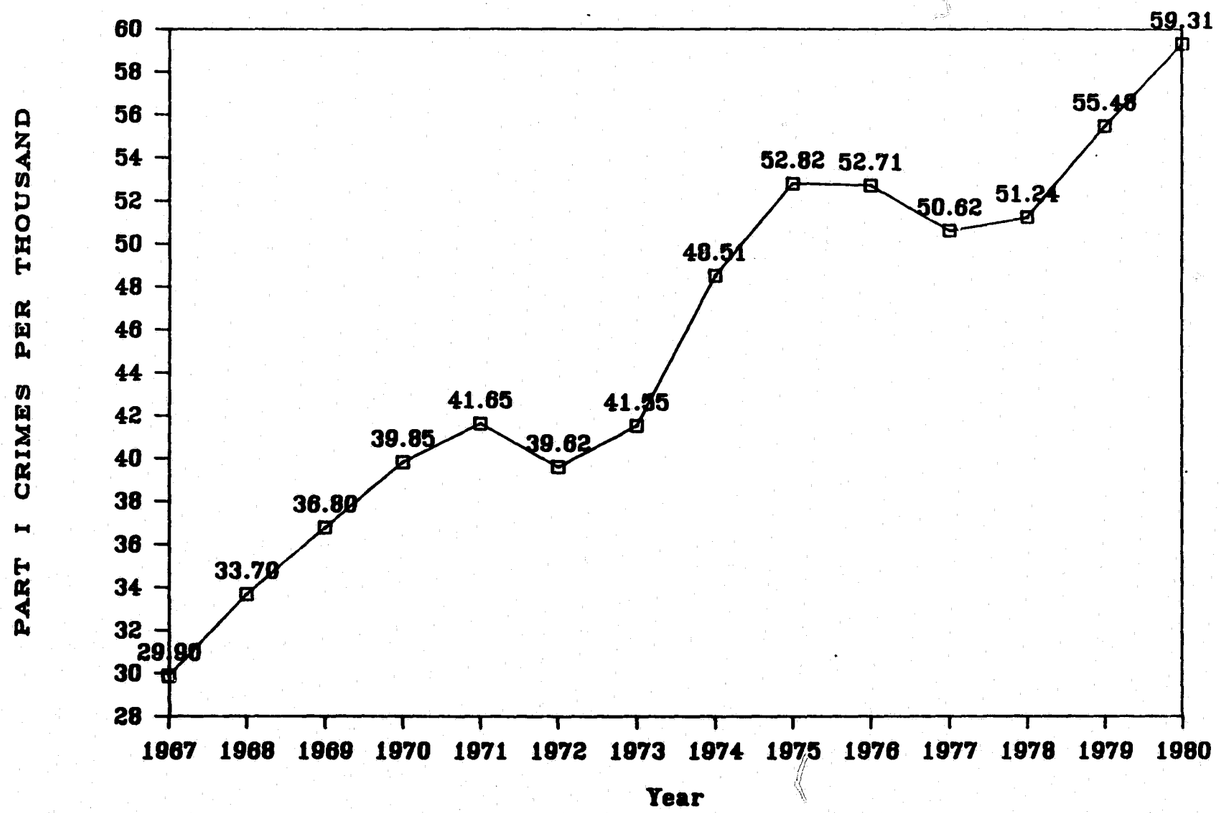
Chapter II
Overview--National Trends

Almost everyone has opinions about causes of crime, but all who have seriously studied the problem agree that we cannot usually identify the causes of the crime rate in a given jurisdiction with any great precision. At any level, we can nevertheless see certain patterns, presumably resulting from whatever the causes are. I am concerned at this point in the discussion primarily with changes over time at the national level. Information about such changes is quite pedestrian, but most people have a very imprecise notion of what changes have occurred. "Everyone knows," for instance, that crime increased tremendously during the 1970's. And "everyone" is right. Between 1967 and 1980, the reported number of Part I offenses increased from roughly 30 to 60 crimes per thousand people, almost exactly doubling. Among individual Part I crimes, rapes increased at the greatest rate, from .140 to .369 per thousand, or 160 per cent. Even auto theft, which increased at the lowest rate, jumped from 3.34 to 5.0 per thousand, or 50 per cent. But the long march upward was not an unbroken one, and the breaks make things interesting.

The reported Part I crime rates in the United States between 1967 and 1980 are illustrated in Graph II-1. This is not an uncommon graph, and it even pops up from time to time on the evening television news. The graph is obviously dominated by the increase in crime. However, it would be a serious mistake to overlook the dips occurring in 1972 and 1977. Those dips may seem to be random blips on a graph which, after all, has only 14 data points. Certainly the evening news pays no attention to them. However, there is nothing random about them. They are produced by systematic differences in the behavior of thousands of people. The word systematic is used purposefully. Random differences on an individual level would produce relative uniformity or absence of movement on an aggregate level. Thus in this most simple-minded of graphs can be seen the effects of powerful forces, affecting not just the general rise in crime rates, but cessation or reversal of the rise at certain points.

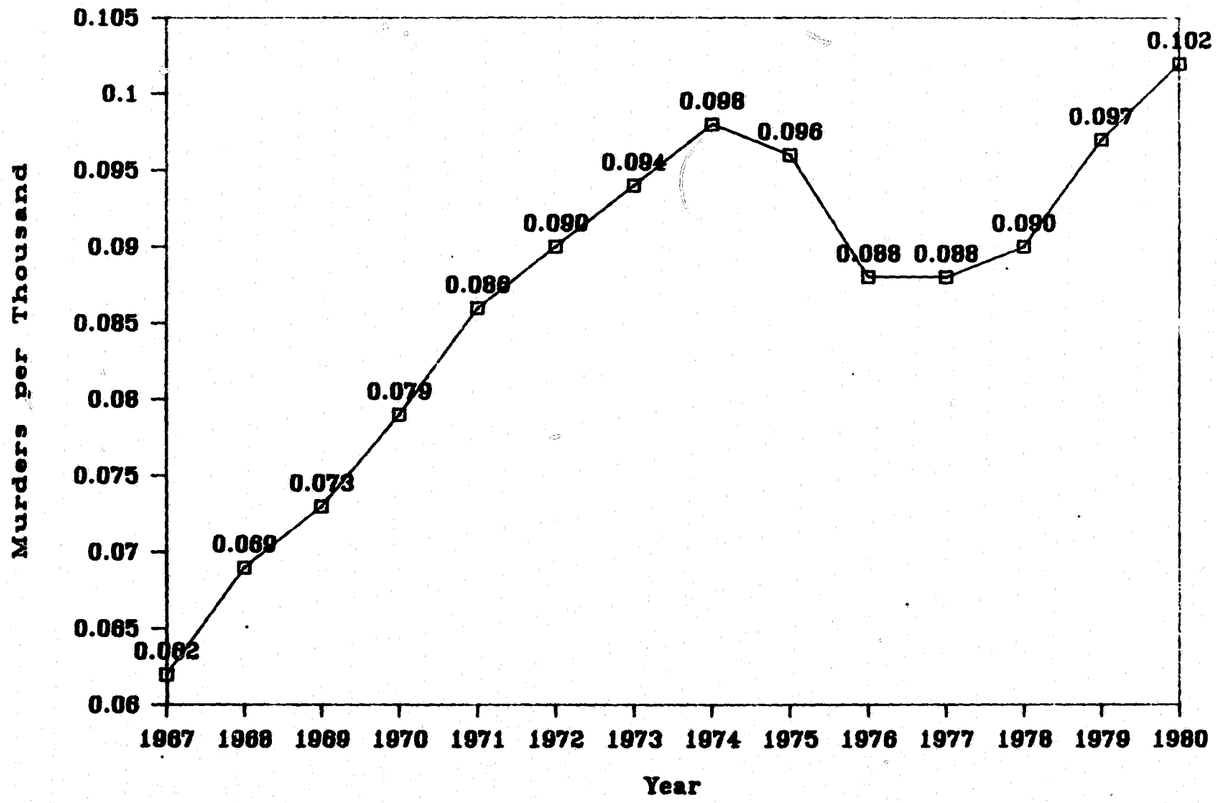
GRAPH II-1

NATIONAL PART I CRIME RATES



GRAPH II-2

NATIONAL MURDER RATES



Examination only of the total of all Part I crimes taken together can be misleading. The size of the figure which measures Part I crimes each year is dominated by the number of larcenies, simply because there are more larcenies than any other type of Part I crime. However, the sense that something systematic is taking place can be increased by examining such other crimes as murder, rape, robbery, and burglary over the same period. They are presented in graphs II-2 through II-5.

The first instinct of many who work in criminal justice when confronted with some irregularity in data is to look for changes or peculiarities in reporting procedures. This is an instinct learned through bitter experience, but if not properly disciplined it can lead to ignoring important patterns. In the first place, changes in reporting patterns can in themselves be important. If national policies are causing the changes, that should be widely known and disseminated. If local policies are causing the changes, it needs to be explained why they are working together in such a way as to produce aggregate differences at the national level. More importantly, however, it would be a serious mistake to ignore, simply because of assumptions about reporting practices, a social, economic, or political force which could be causing the change.

As noted, this paper will resolutely avoid the temptaton to analyze the nature of forces that move the populace, but will point out when they exist and try to specify their location. In the cases examined here, mere reporting differences do not seem to explain very much, and the theory that the trend is just showing random jiggles explains nothing and is untenable to boot. If the jiggles were random, they should not show up in such diverse crimes as those illustrated.

The notion that dips in the crime rate between 1967 and 1980 occur at random is further undermined by examining trends in different parts of the country. If dips were random, they should not occur in different parts of the country at the same time. Graph II-6 indicates that they do. In fact, Graph II-6 is something of a show-stopper. The lines on the graph represent Part I

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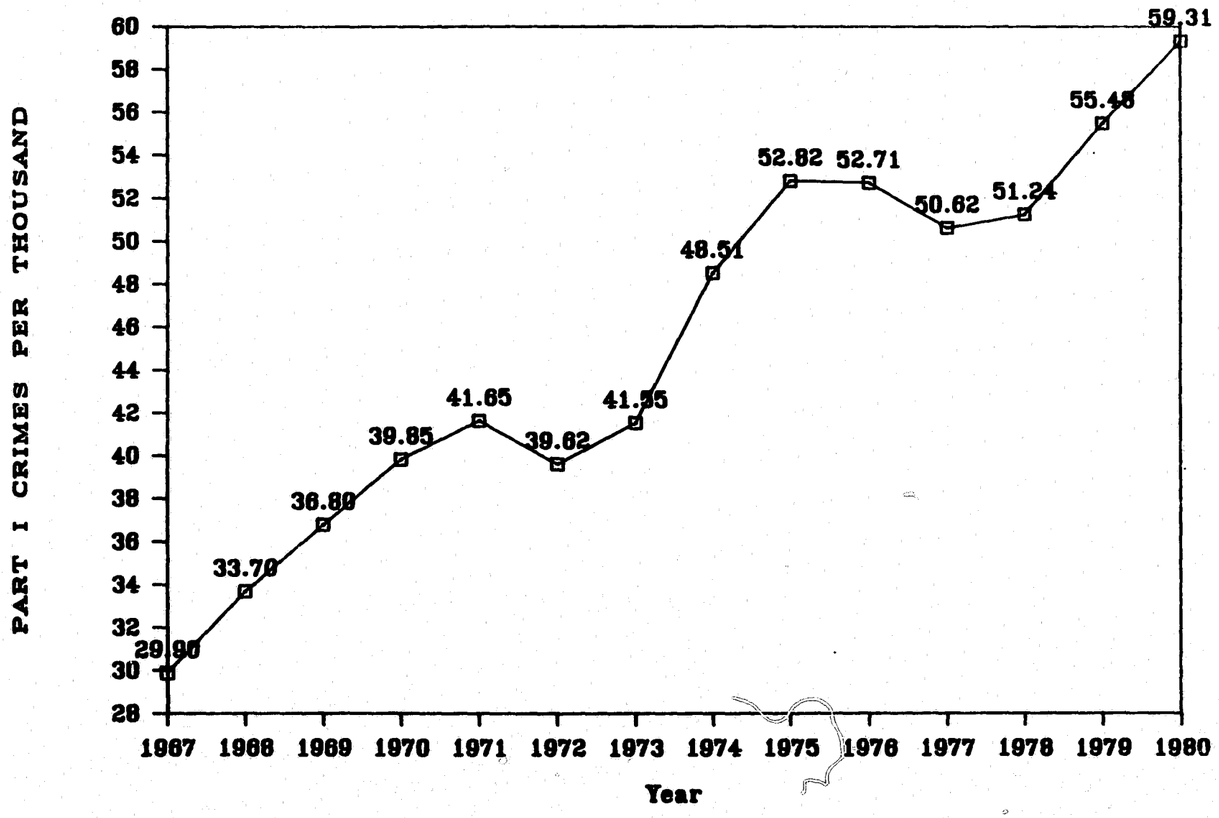

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GRAPH II-2

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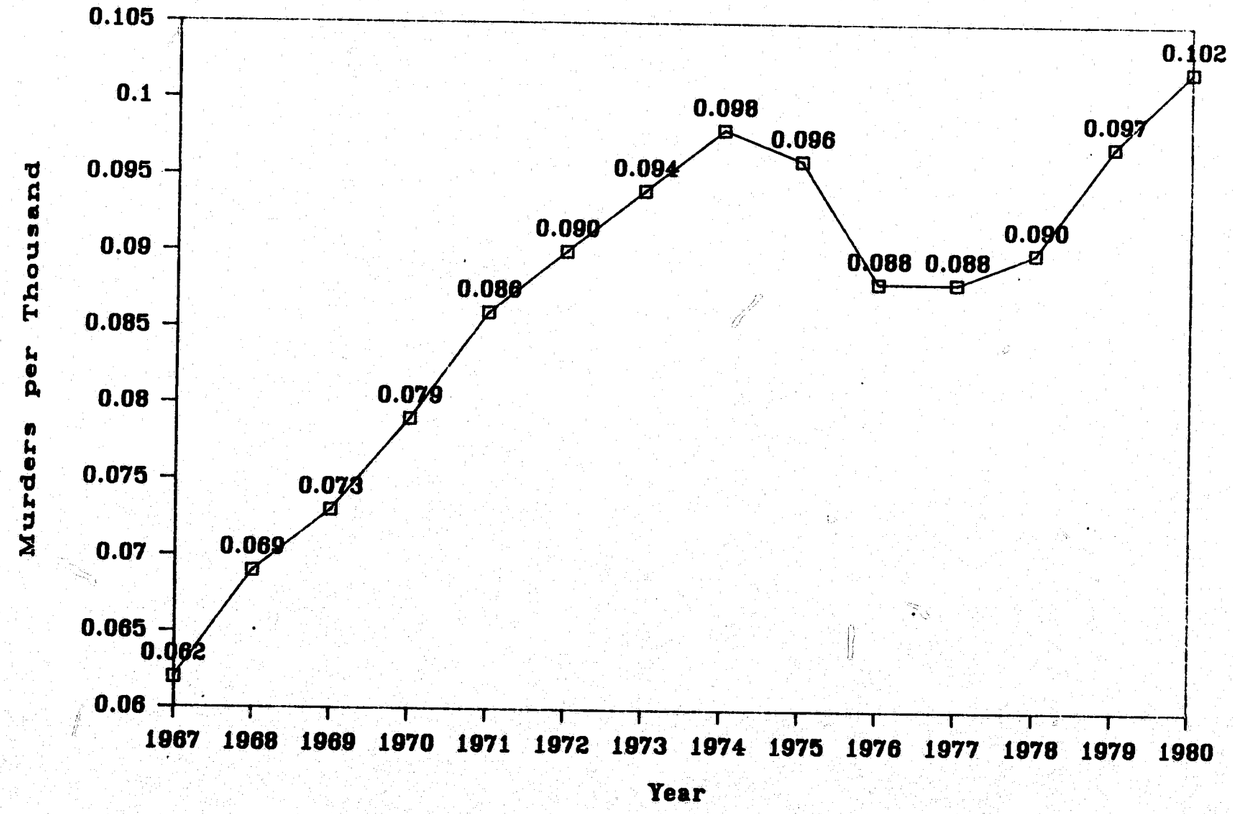
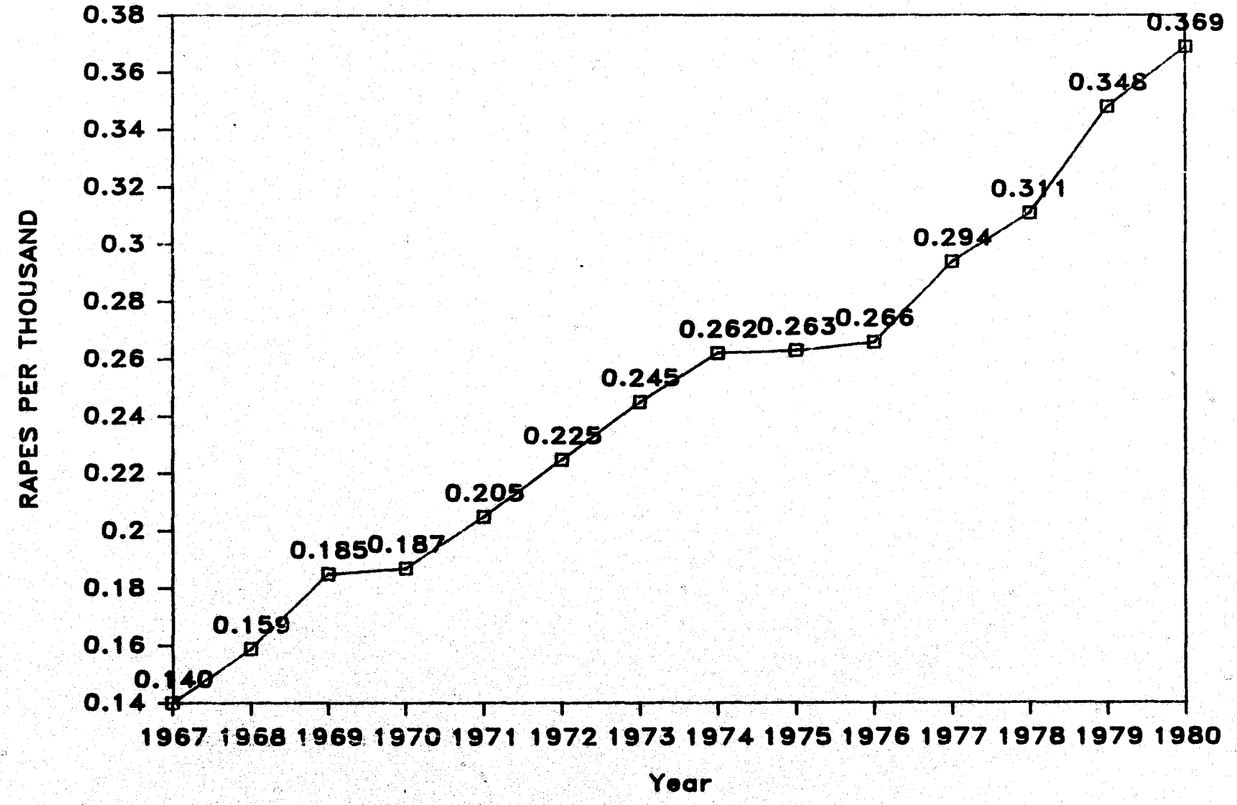


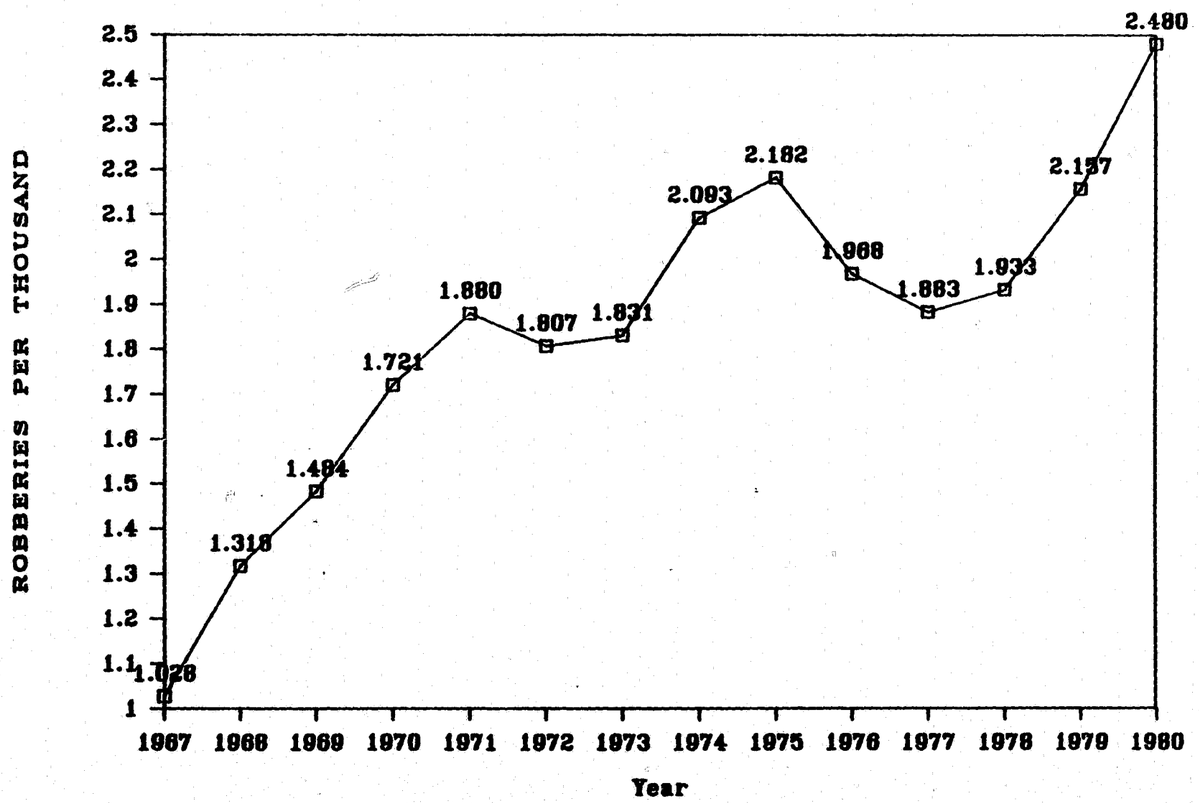
GRAPH II-3

NATIONAL RAPE RATES



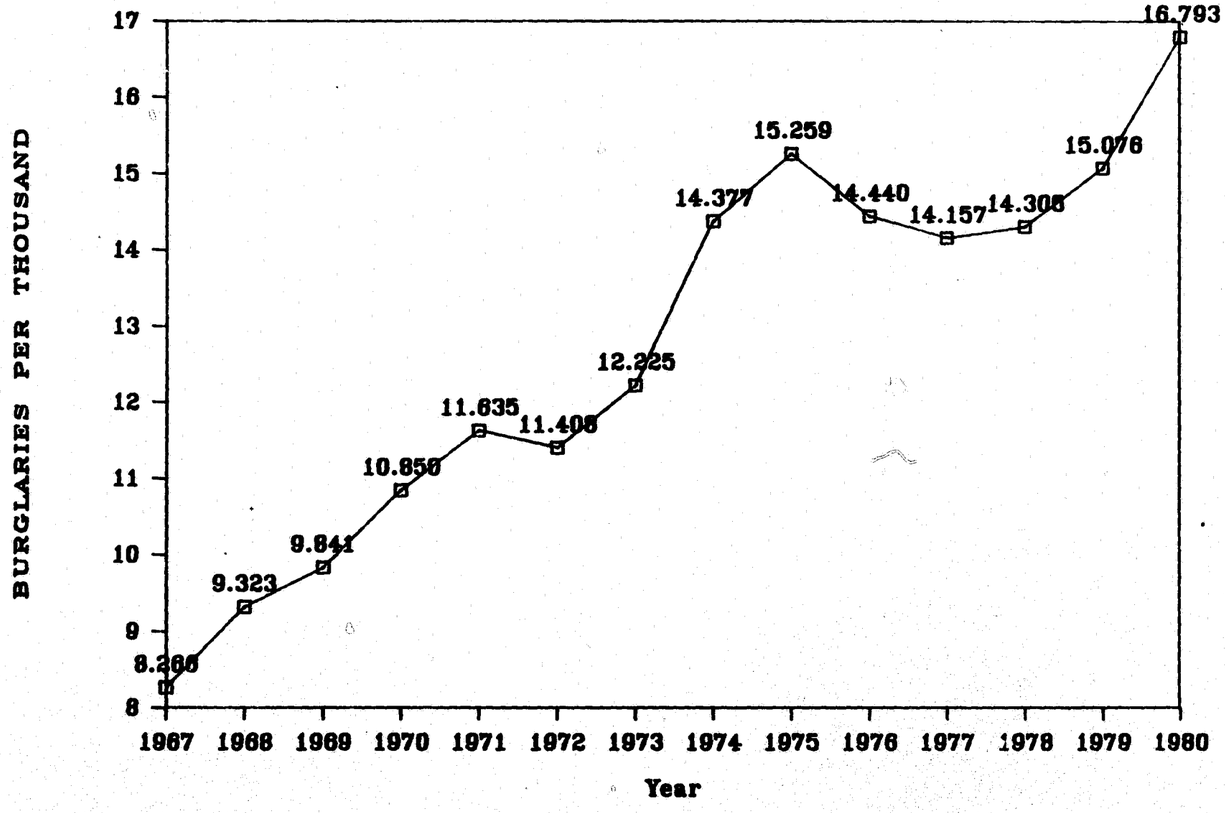
GRAPH II-4

NATIONAL ROBBERY RATES



GRAPH II-5

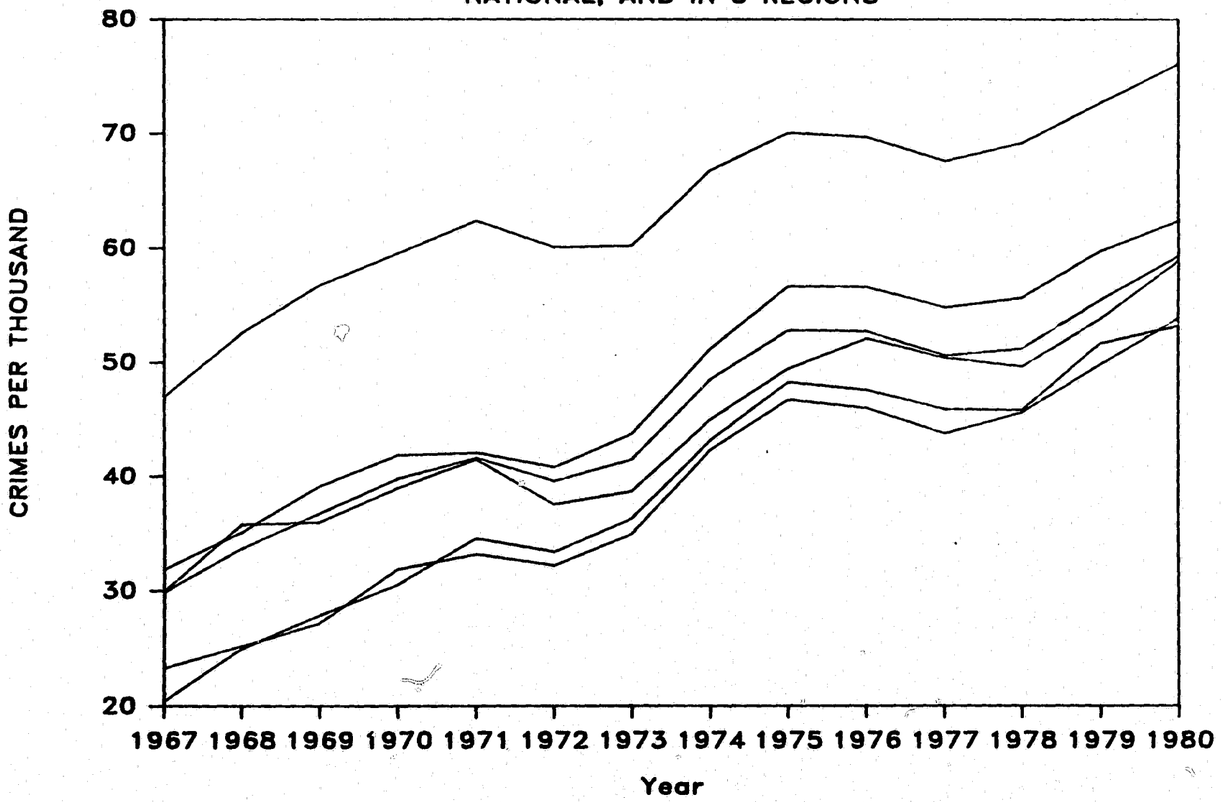
NATIONAL BURGLARY RATES



GRAPH II-6

PART I CRIMES

NATIONAL, AND IN 5 REGIONS



crime rates at the national level (which is somewhere in the middle) and in the Northeast, Middle Atlantic, South, Southwest, and West.* The states were grouped into regions solely on the basis of geographic contiguity, and no great effort was made to make the groupings sociologically significant. Nevertheless, the regions shown are very different, ranging from the effete Northeast, where crime rates are lowest, to the wild West, where they are highest. They contrast areas of economic decline and economic growth, of population increases and population stagnation. The differences in crime rates are actually quite extreme. Yet when crime rates in the different regions change, they tend to change together, with a degree of uniformity which catches the eye. Actually, there is more to the apparent uniformity than meets the eye, as subsequent analysis will show. For the moment, it is enough to note that, different as the regions obviously are from each other, they respond to <u>something</u> in very similar ways and at the same times.

Charts II-7 through II-9 show that the regions exhibit very similar patterns on a diversity of crimes, although the uniformity breaks down in motor vehicle theft. It would be expected that the uniformity would break down to some extent as smaller units were compared. Nevertheless, individual states also seem to follow the national pattern quite closely, as illustrated in Graph II-10. Even individual jurisdictions show a tantalizing degree of conformity, as illustrated in II-11.** Looking at such

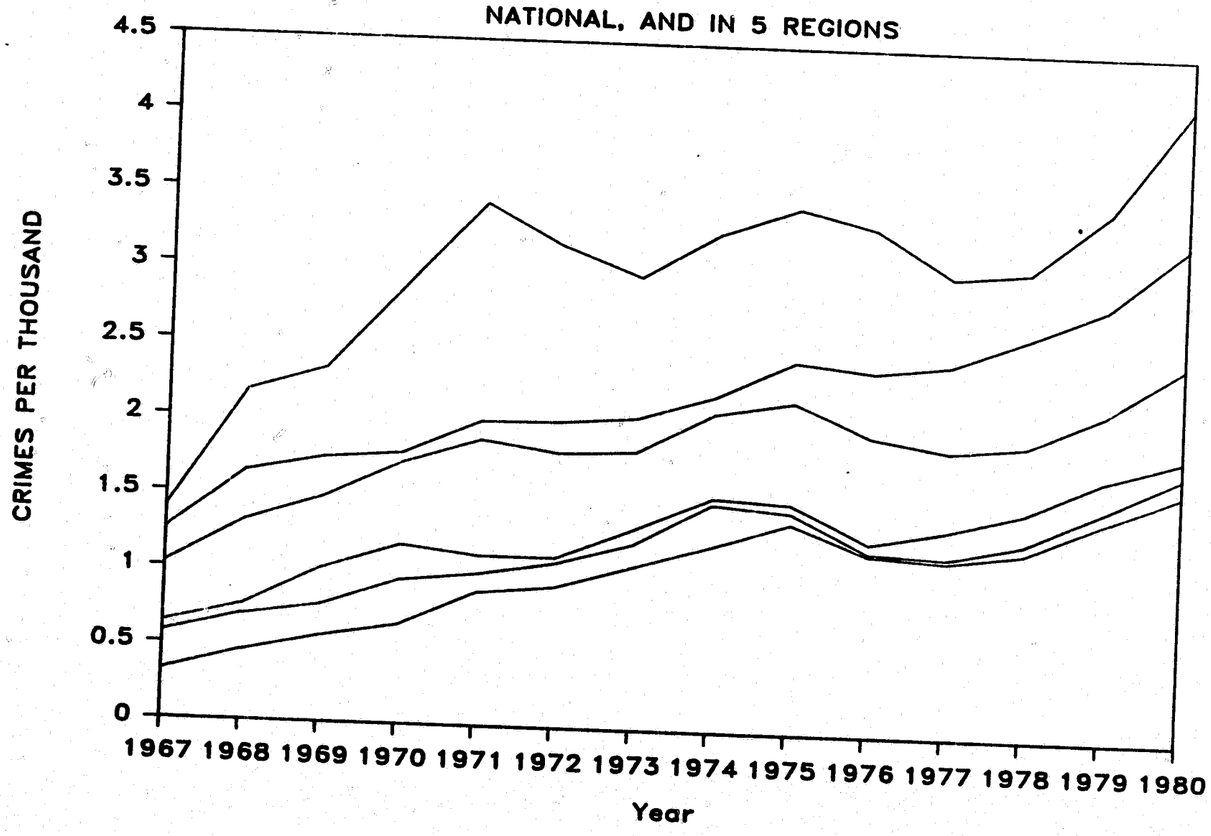
*States were grouped as follows: Northeast--CT, MA, ME, MS, NH, RI, VT; Mid-Atlantic--DE, MD, NJ, NY, PA; South--AL, AR, FL, GA, KY, LA, NC, SC, TN, VA, WV; Southwest--AZ, NM, OK, 43; Midwest--IA, IL, IN, KS, MI, MN, MO, OH, PA; West--AK, CA, HI, NV, OR, WA; Northern Midwest--CO, ID, MT, NB, ND, SD, UT, WY. All the regions showed similar patterns. They are not all illustrated because showing them would give no additional useful information, and because only so much can be crammed on one graph. Partly for the same reasons, the lines are not labeled. The graph is only only meant to illustrate broad general trends and this study will not attempt to analyze regional differences.

**The preceding graphs are only illustrative of broad trends. Had it been necessary to try to draw precise conclusions from them I would have taken greater care in deciding on regional

GRAPH II-7

ROBBERY

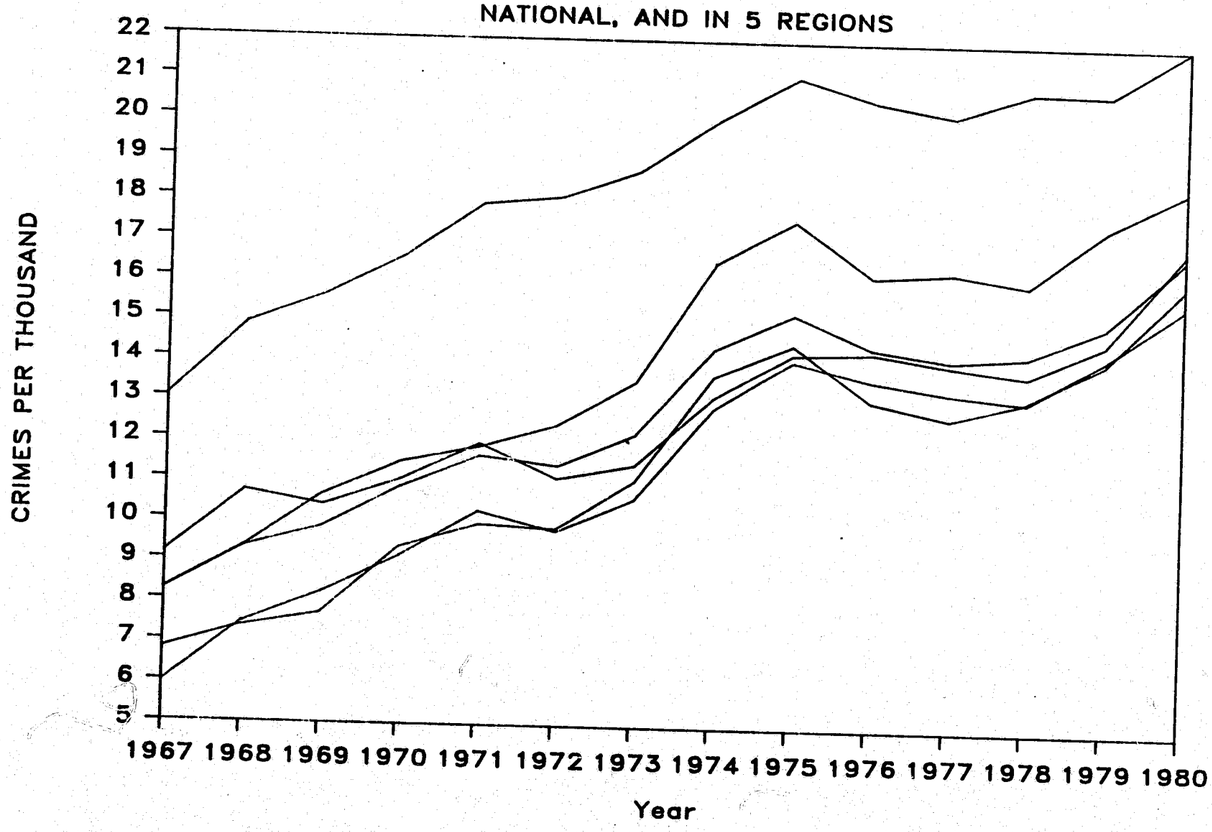
NATIONAL, AND IN 5 REGIONS



GRAPH II-8

BURGLARY

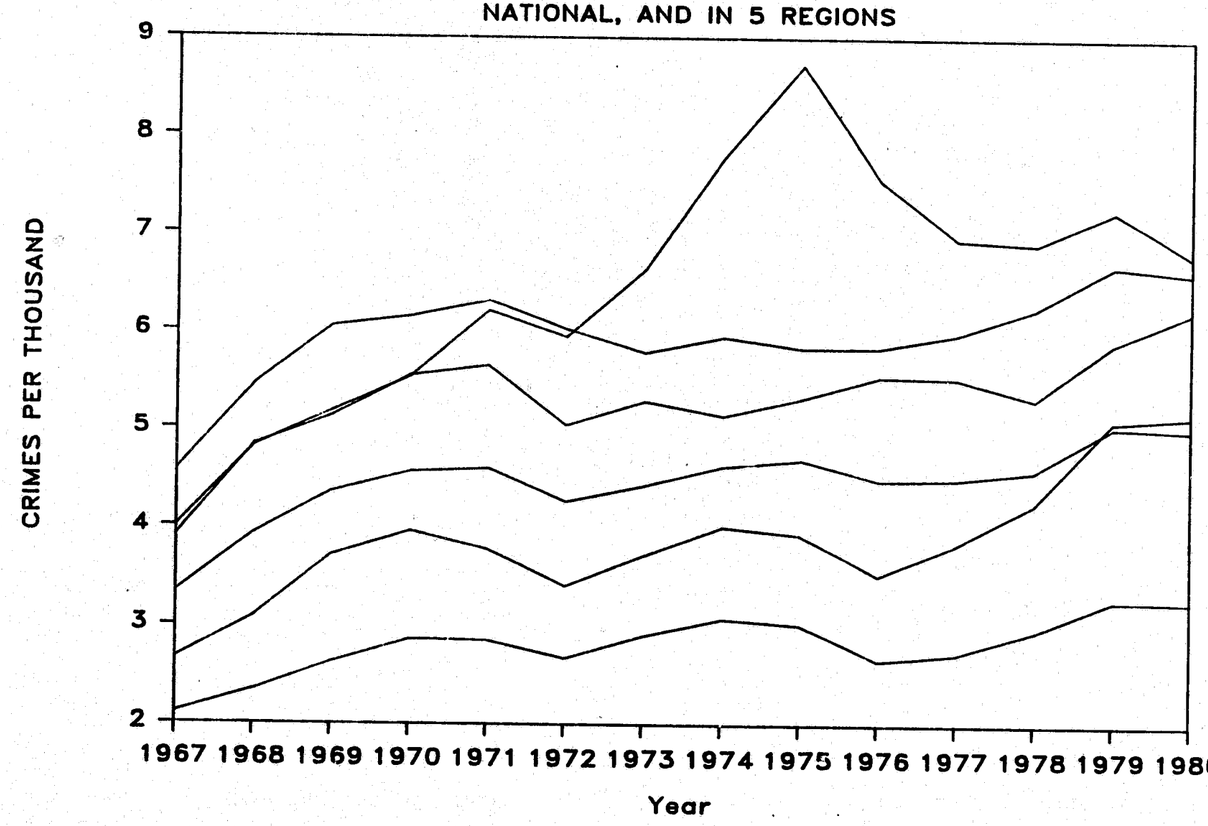
NATIONAL, AND IN 5 REGIONS



GRAPH II-9

MOTOR VEHICLE THEFT

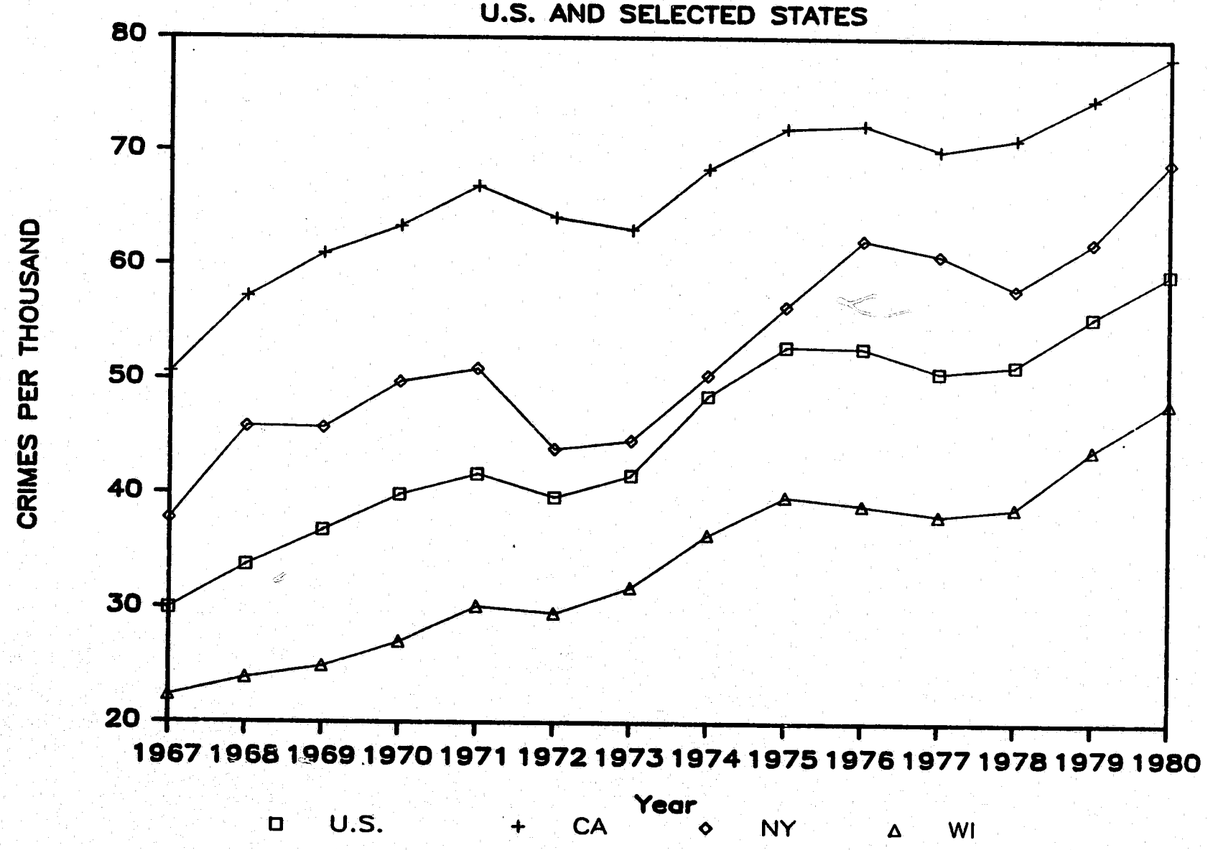
NATIONAL, AND IN 5 REGIONS



GRAPH II-10

PART I CRIME RATES

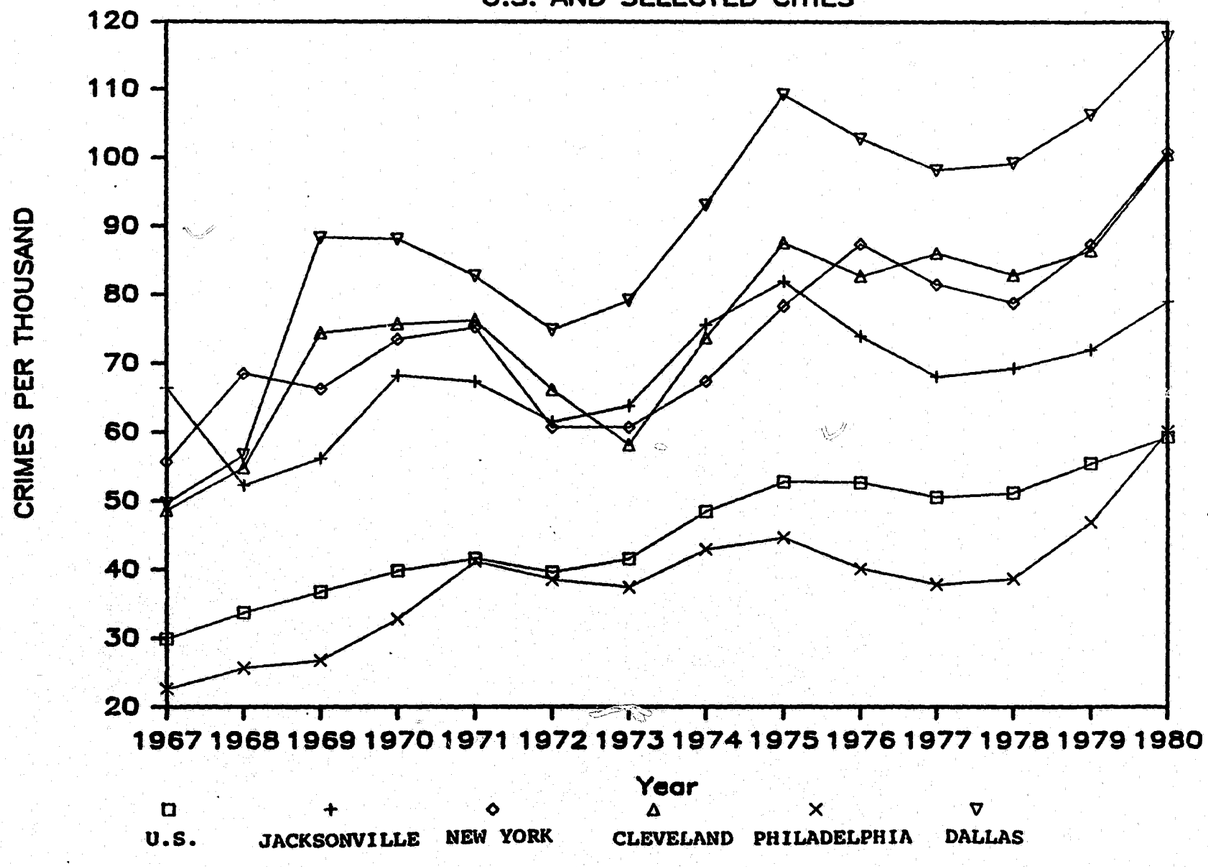
U.S. AND SELECTED STATES



GRAPH II-11

PART I CRIME RATES

U.S. AND SELECTED CITIES



graphs long enough leads one to suspect the figures when there is a deviation from the general trend. For instance, it seems strange that Jacksonville, Florida should experience a drop in its crime rate between 1967 and 1968, when cities in the rest of the country were experiencing a rise. In fact, that was the period when Jacksonville annexed all of Duval County, thus mixing some country calm with the urban jungle.

The preceding graphs suggest the existence of phenomena of more than trivial importance. They suggest the existence of forces which not only affect the nationwide crime rate but which simultaneously affect states and a variety of jurisdictions in very similar ways. They fairly demand a more systematic examination. Such an examination is attempted in subsequent chapters.

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placement and attempting to get representative cities. As it was, I decided which regions to illustrate on the basis of which were most distinguishable on the graph. I chose states to be geographically dispersed, and cities to be fairly large and geographically dispersed.

Chapter III
Variance Components

Whatever forces affect crime rates, they must operate on the national, state, or local levels or some combination of those levels. Even if the variables which constitute those forces cannot be pinpointed, their effects can be seen, and it may be possible to discover the magnitude of the forces coming from different levels through examination of the patterns of effects. This is, in fact, a problem that Donald Stokes addressed quite neatly over 20 years ago through use of a variance components model to examine voting patterns.[1]

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[1]Donald E. Stokes, "A Variance Components Model of Political Effects," in John M. Claunch, ed., Mathematical Applications in Political Science, Vol. I (Dallas, The Arnold Foundation, 1965). Stokes devoted his entire article to development of the model in a manner comprehensible to a non-statistician. That development will not be repeated here. However, for the benefit of technically minded readers, I repeat below the equations Stokes derived (and tucked in an appendix), which I have adopted. I have also shamelessly repeated prose explanations in his appendix.

Below are the formulas used to derive the national ("a"), state ("b") and local ("c") variance components. The index "i" varies over states with a maximum value "I", the index "j" varies over districts within states with a maximum value "J_i" for the "ith" state, and the index "k" varies over years with a maximum value "K." The equations for Var(b) and Var(c) contain terms to adjust for the fact that district forces, summed across a state, will be responsible for some of the variation of the state mean and district and state forces, summed across the nation, will be responsible for some of the variation of the national mean.

$$Var(a) = \frac{\Sigma_k a_k^2}{K-1} - \frac{\Sigma_i J_{ik} b_{ik}^2}{(\Sigma_i J_i)^2 (K-1)} - \frac{I}{I-1} \cdot \frac{\Sigma_i \frac{\Sigma_j \Sigma_k c_{ijk}^2}{J_i(K-1)}}{\Sigma_i J_i}$$

$$Var(b) = \frac{I}{I-1} \cdot \frac{i J_i \frac{\Sigma_k b_{ik}^2}{K-1}}{\Sigma_i J_i} - \frac{I}{I-1} \cdot \frac{\Sigma_i \frac{\Sigma_j \Sigma_k c_{ijk}}{J_i(K-1)}}{\Sigma_i J_i}$$

$$Var(c) = \frac{\Sigma_i \Sigma_j Var(c_{ij})}{\Sigma_i (J_i - 1)}$$

Aside from a difference in the units of analysis (Stokes examined Congressional Districts.), Stokes' examination of voting and turnout patterns precisely parallels the examination we wish to make of crime rates. In his analysis, Stokes was able to find, for instance, that in the decade stretching from 1952 to 1960, 32 percent of the variance components in the two-party vote were attributable to national-level forces, and 49 percent were attributable to local-level forces. In contrast 86 percent of the variance components in turnout in general elections was attributable to national forces while only 6 percent was attributable to local forces.[2] It will later become apparent that Stokes' methodology does not tell us all we would like to know about patterns in our data, but as an early cut at the problem, it is instructive to simply apply the same methodology to crime rates.

The initial sample subjected to variance components analysis and discussed here consisted of 581 jurisdictions selected in the following manner: From the population of jurisdictions upon which Uniform Crime Report (UCR) data gathered by the FBI was available over the period from 1967 to 1980, a sample of up to 20 jurisdictions with a population of 10,000 or over in 1967 was randomly selected from each state. If fewer than 20 jurisdictions met the qualifications in a given state, whatever number did meet the qualifications was accepted. There was one further condition--that no jurisdiction could be included unless some other jurisdiction in the same state also met the other conditions. The requirement of at least two jurisdictions from each state was necessitated by the form of the equations used in the analysis, which would result in division by zero if there were not at least two jurisdictions from each state.

It has become a tradition approaching the level of ritual for criminal justice researchers to lament the sorry state of crime data. While the desire for perfect data is understandable, such data are seldom available anywhere in the social sciences.

[2]Stokes, pp. 75-76.

In the case of the data used here, no ritual of lamentation is justified. William Bowers and Glenn Pierce, working in cooperation with the Inter-University Consortium for Social Research, have gathered UCR data on local jurisdictions into a single machine-readable dataset, from which most of the data used here have been drawn. The dataset does have limitations long noted as inherent in UCR data, and no one should have faith that reports from any single jurisdiction accurately reflect true crime rates to the third decimal place (or even the first). We are here looking, however, at aggregate data and aggregate trends which would not be altered appreciably even with quite a few changes in reports from individual jurisdictions.

It is necessary to emphasize that there are certain effects which must be expected to result from the fact that UCR data are only indices of true crime rates, and inevitably imperfect ones. Local definitions and coding practices change despite (and sometimes because of) the best efforts of the FBI to standardize practices, boundaries change, digits get mistyped, and sometimes reports reflect political or management decisions which result in heavier reporting of one crime or another. Within the analyses in this paper, in almost every case, the resulting inaccuracies can only have the effect of increasing the apparent amount of variance on the local level.

Local effects, then, should simply be understood to include such variations and reporting inaccuracies. Conceivably, state-level changes could result in reporting changes in jurisdictions throughout a given state, but, as we shall see, independent state effects are small enough to make such events seem unlikely to be of importance. A change in definition by the FBI should increase apparent national-level effects, but there are no sudden changes in trend lines which can reasonably be attributed to such a change. In short, most errors appear to be those which would result in an over-emphasis on local effects. Whatever national effects appear in the data (which are indices of crime

rates) are therefore, if anything, smaller than those really inherent in crime rates.[3]

An exception to this might occur if nationwide concern about a crime results in rises in reports of the offenses even though the crime itself may not be increasing. As noted, this paper will not attempt to discover causes of changes in the indices, but in such an instance the cause of change in the index would in itself be a very interesting subject of study rather than merely something which clouded analysis.

Obviously, the sample described above did not approach being a random sample which could be considered representative of every jurisdiction in the United States. Furthermore, it is entirely possible that jurisdictions which sent UCR reports in every month for 14 years differed in unknown but important respects from those which did not.

We can only measure with data which exists, and it is not necessary to be too discouraged about the sample. Jurisdictions which met criteria for inclusion in the sample contained about 38 percent of the population of the United States in 1967, so even if we can only claim the sample is representative of a portion of the United States, it is no negligible portion.*

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[3]In Forecasting Crime Data, James Fox also discusses why UCR data are good enough to be useful for his analysis. Because Fox used the data only to examine time series, he did not need to give cautions about the sources of local variance which I have given above. See James Alan Fox, Forecasting Crime Data (Lexington, MA, Lexington Books, 1978), pp. 7-8.

*Selection of a different set of years or even a slight relaxation of the requirement that all UCR reports be available could increase the proportion of jurisdictions represented, but such actions would decrease the (already too few) years available for analysis, and add doubts about the meaning of the data in the sample. They would be unlikely to affect results significantly. I also made no attempt to remove from the sample jurisdictions which were obviously outliers, either because of differences in reporting practices or unusual behavior patterns. This was partly an effort to leave the sample with as much integrity as possible, but there is no doubt that the local effects appear more important under this practice than they would after a little judicious pruning. Avoiding such pruning was consistent with the general approach in this paper of confining as many of the

The results of performing a variance components analysis on each of six Part I crimes and on all Part I crimes taken together are presented in Chart III-1.

Three broad observations can be made immediately:

1. The influence of national forces on rates of some crimes in most jurisdictions is appreciable.

2. The influence of state-level forces is not very large.

3. Different crimes show different patterns.

That is as much as can be said on the basis of what has been presented so far. The attern of results also serves to reveal some weaknesses in the method. The weaknesses severely limit the inferences which can be made, and consideration of them will have to be an integral part of subsequent discussion.

For purposes of this analysis, the absolute size of a variance component is of no interest. What is of interest is the relative size for a given crime of the national, state, and local components. It is the relative sizes which are given in Graph III-I. As can be seen burglary and larceny exhibit fairly similar patterns, and in each the influence of national forces appears to be about the same size as that of local forces. In contrast, the influence of local forces is clearly predominant in rape, robbery, and auto theft. Simple and clear as all this may seem, the graph masks a swamp of pitfalls and complications, and it cannot be negotiated without first making a journey through the dry landscape of methodological considerations.

If a crime is infrequent, the crime rate will always be near zero, even if the rate doubles or triples from one year to the next. Consequently, the absolute size of the variance in the crime rate will be small, even if the variance is large relative

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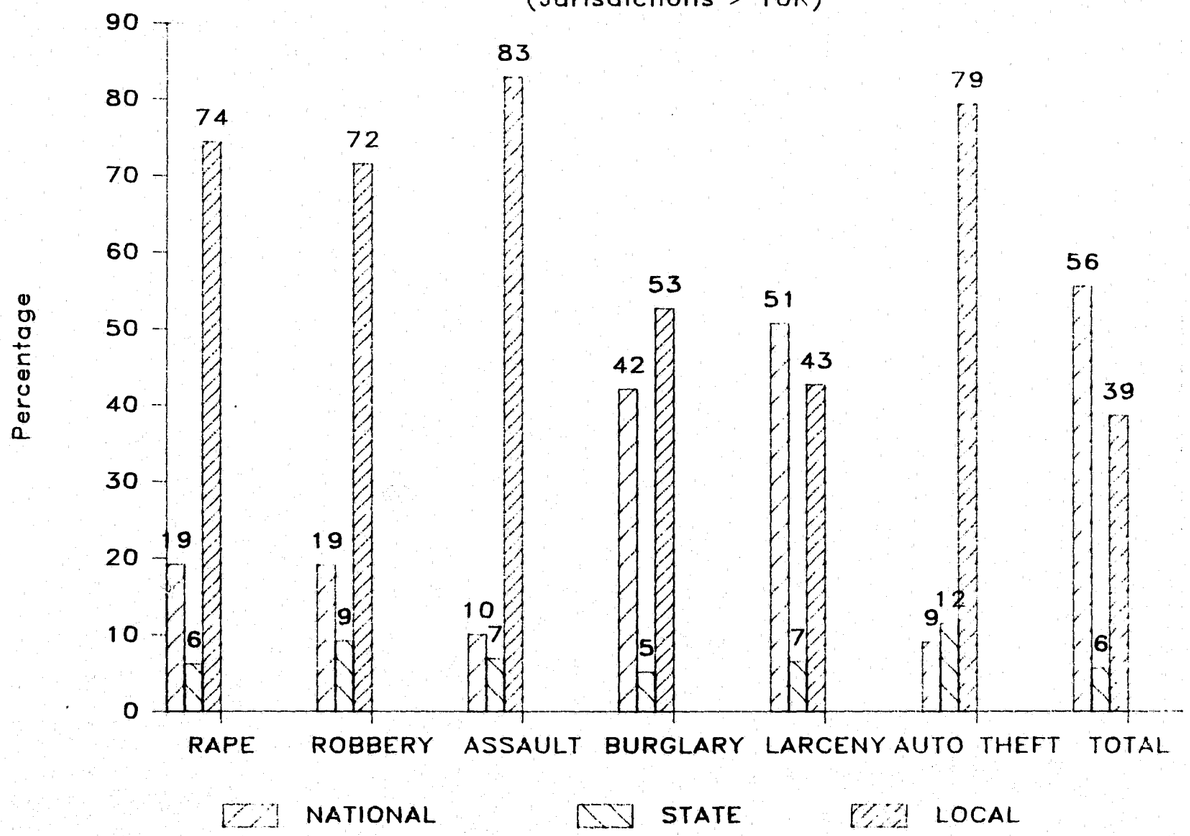
effects of sampling error as possible to the local level.

In general, later research refining what is done here will probably find more to gain from judgemental selections of jursidictions than from attempts to achieve more representativeness through random selection. An even more obvious gain will come from extension of analyses to years beyond 1980. Data on these years were not available when this study began, but Bowers and Pierce are extending their work, so such data should be available for later researchers.

GRAPH III-1

VARIANCE COMPONENTS (BY PERCENT)

(Jurisdictions > 10K)



to the rate. In contrast, the variance in a more frequent crime (say, larceny) will be absolutely high, since a change of a few percentage points in the rate will result in a large difference in the size of the rate. For example, if the rate of rapes is .15 per thousand one year and doubles the next, it becomes .3 per thousand--a very small variation. If the rate of larcenies is 15 per thousand and goes up ten percent, it goes up by 1.5 per thousand, or ten times as much as rape did. In the real world, the larceny rate is not going to double in a year, except in the tiniest of jurisdictions. We reduced the probability of that happening in any of the sampled jurisdictions selecting only jurisdictions with a population of at least 10,000. Similarly, the rate of rapes is not going to increase drastically at the national level from one year to the next. However, it would not be too rare to have the rate of rapes in a jurisdiction of 10,000 double. One rapist might cause that. In other words, rare crimes are likely to have variances across jurisdictions which are proportionately large although absolutely small.

In statistical terms, this means that the variance in the rate of rapes is likely to be large relative to the overall rate at the local level. In contrast, the variance in rape rates will not be unduly large at the national level and variance in larcenies is unlikely to be large relative to the rate at either the national or the local level. Since the variance components analysis used in this paper compares local and national variability, we can generalize to say that less frequent crimes will tend to be more variable relative to rates at the local level, and the apparent role of local forces will be greater in them than in the more frequent crimes.

None of this invalidates our results (which show effects), but it certainly does complicate our interpretation (which is about causes). From the standpoint of a single jurisdiction, it all looks rather reasonable. If a rapist or band of robbers goes on a rampage in a small town, the resultant jump in the crime rate will certainly appear to be the result of local forces, and our measures would seem to rightly reflect that. The apparent

reasonableness of all this is in fact too easily invoked. If a condition exists in some small jurisdiction which, when stimulated by some national policy or event, results in a crime, is the "cause" of the crime national or local? Obviously the combination was necessary. There is fuel for a great deal of philosophical discussion here, but this is the place to emphasize that we will be observing not causes, but effects.* Any inferences will be about causes (i.e., state, national, and local "forces"). It is making the inferences which contains the hazards.

We must, however, adopt some convention or definition concerning what we will consider to be a local, national, or state effect. If the local conditions are diverse in a way that makes jurisdictions respond differently to a given event or set of events, I have chosen to call that a local effect. If jurisdictions all over the country respond in the same way, that is a national effect. Clearly causes can simultaneously have national, state, and local effects.

Useful as the local perspective is for some purposes, this paper will be more prone to focus on the question of whether some national-level force or condition encourages rampages throughout the country. If it does, national rates will increase, increasing national-level variance and what we are calling national effects. However, if a crime is rare, the rampages are likely to appear in some small jurisdictions and not in others, thus increasing local effects. Consequently the relative size of local effects may increase in the case of a rare crime where it wouldn't have in a common crime.

This unsatisfying state of affairs is an inevitable consequence not just of the method we have used, but of our definitions of "national" and "local" effects. The dissatisfaction most people will feel with this should not be blamed solely on our definition and method, however. It is at root a dissatisfaction with the complexity of a universe which resists simple

*More properly speaking, we will be examining indices of variables in their role as effects.

descriptions. Again it must be emphasized that the results are not invalid; they just do not imply anything so simple as it would first appear. They also give an incomplete picture, to which we will attempt to add detail by looking at matters from another perspective in later chapters.

The above discussion provides an opportunity to point out a related paradox, this one most explicitly involving causes. In the case of both the common crime and the rare one, an increase in rates in any small town will almost always appear to be the result of local events. A local observer will always be able to point to a permissive judge, or an imprudent bail decision, or a Jesse James (who committed the crimes) as the important local factor. The local observer will consequently be tempted to scoff at people who come in with fancy theories to explain crime. If, however, some event or condition with a nationwide impact affected the nature of bail decisions or the actions of a lot of Jesse Jameses everywhere, the observer who looks at things from a national perspective will perceive a national effect and infer a national-level cause.

Neither the national nor the local perspective is necessarily wrong. It may be obviously beneficial to keep Jesse off the street no matter what kind of causal chain can be discerned, but if a state or national-level effect can be found, it may suggest an additional course of action which is not so obvious. If we are fortunate, that course will be more desirable and more cost-effective than waiting until a crime has occurred, then locking up Jesse.

Earlier discussion emphasized that lack of reliability in UCR reports as indices of crime rates would tend to increase the effects of local forces. It is now clear that small jurisdictions and rare crimes will do the same thing, thus placing limitations on our ability to specify sources of influence.*

*It would, of course, be possible to weight jurisdictions by population, mitigating the effects of small size. However, I wish to compare the behavior of jurisdictions, not make inferences about the behavior of individuals. Furthermore, the

What this means for interpretation in this paper is simply that, insofar as we make inferences about causes from our observations of effects, we must take the apparent influence of national forces as the lower limit of such influence, among jurisdictions with a population of more than 10,000. We cannot tell from these figures alone how much greater the influence of those national forces might be.

I have to this point steadfastly ignored an apparent paradox appearing on the far right of Graph III-1. The national effect for all Part I crimes taken together appears to be greater than the national effect for any one of the crimes taken separately. How can this be? The answer is actually contained in the previous discussion. That discussion emphasized the extent to which apparent local influences on infrequent crimes were exaggerated by the methodology being employed. The same kind of emphasis takes place among the more frequent crimes, albeit to a lesser degree. The more frequent the crime, the less the local emphasis. The frequency of all Part I crimes taken together is clearly greater than that of any one crime, so the influence of local jurisdictions is emphasized less. A probable second factor arises from recording errors. Local practice in one jurisdiction may result in a given crime being classified as a larceny, whereas another jurisdiction may classify it as burglary. The resulting differences will always tend to show up as local effects. However, both jurisdictions will probably record the crime as Part I, thus cancelling the local effect among the combined crimes.

Motor vehicle theft has thus far played no part in the discussion. It exhibits quite different characteristics than the other crimes. The apparent influence of national forces acting

discrepancies in sizes of jurisdictions are so great that the results would reflect primarily the behavior of a few large jurisdictions, and large jurisdictions may behave quite differently than others. Investigating that possibility is an obvious direction for further research to take, but I have not been able to do so here.

on motor vehicle theft is almost negligible, but motor vehicle theft is by no means the most infrequent of the crimes presented. This suggests that the forces acting on motor vehicle theft may be of a different nature than those acting on the other crimes. The next section will provide an opportunity to investigate that possibility, among others.

Results with a Sample of Larger Jurisdictions

The preceding section established not just that the infrequency of crimes played a role in increasing local effects (and thus the apparent impact of local forces), but that the smallness of jurisdictions also played a role. If that is true, a sample containing larger jurisdictions should show larger national effects than did the previous sample. I have consequently run the same equations on a sample similar to the previous one, except that all jurisdictions had a population of at least 50,000 in 1967.*

The results are displayed on Graph III-2. Graph III-3 has been provided to allow easy comparison of the national effects in the first sample and the second.

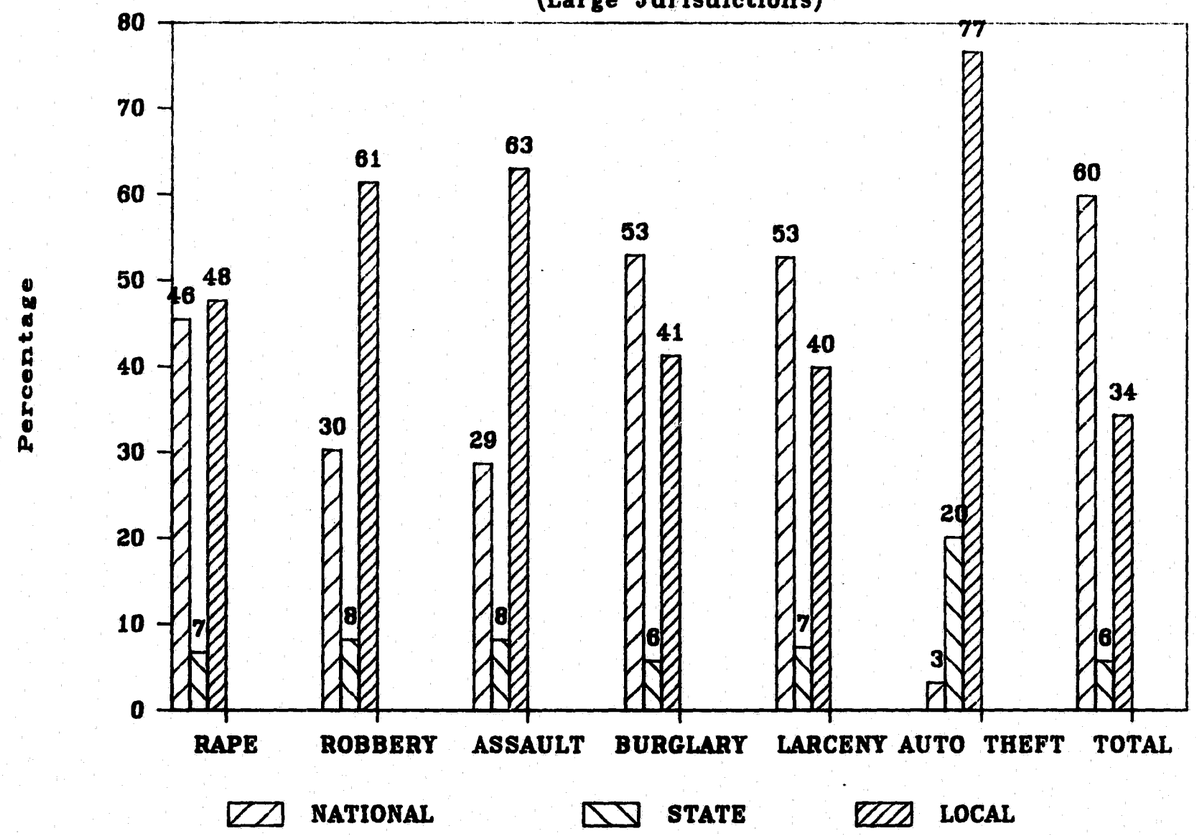
As can be seen, the size of the national influence is gratifyingly larger in the case of every crime but one. The one exception is motor vehicle theft, and it too fits the discussion in the previous paragraphs. Rather than increasing, the national

*The sample was drawn to include as many large jurisdictions as possible in the following manner: Within each state up to twenty jurisdicitons with a population of at least 50,000 was selected, with the larger jurisdictions selected first. In fact, as many as two such jurisdictions were available in only 37 states. A population of 50,000 hardly qualifies a city as a metropolis, and it might fairly be questioned as a cutting point if it was chosen primarily to exclude small jurisdictions. However, the main point was to include large jurisdictions while preventing the sample from being dominated by small jurisdictions. Needless to say, this sample is even further from being a random sample than the previous one. However jurisdictions in it contained about 27% of the population of the United States in 1967.

GRAPH III-2

VARIANCE COMPONENTS (BY PERCENT)

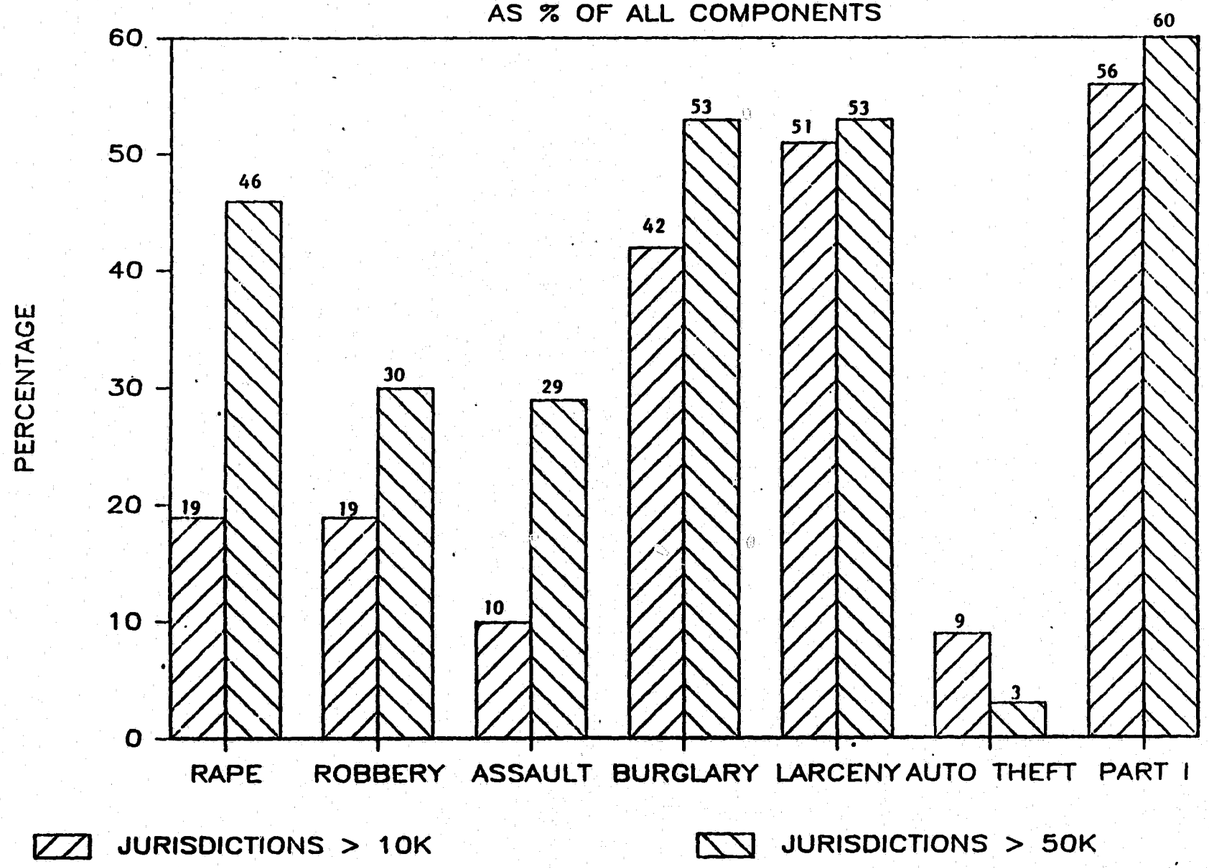
(Large Jurisdictions)



GRAPH III-3

NATIONAL VARIANCE COMPONENT

AS % OF ALL COMPONENTS



effects appear to have decreased in the case of motor vehicle thefts.

The results when using only jurisdictions with populations of more than 50,000 are not evidence that larger cities are significantly different than small ones, although they may in fact be different. The results, instead, serve to re-emphasize that variability due to sampling error and the limits of our measuring instruments tends to be thrown into the local component. The smaller the local jurisdicitons which serve as units of analysis, the more such variability there will be. Unfortunately, as the minimum size of jurisdictions allowed is increased, the size and representativeness of the sample decreases. Of course the sample which remains in this case is quite representative of jurisdictions with a population of over 50,000, even if it is not at all representative of smaller jurisdictions. In this case, we can probably feel justified in believing that national forces in general play a larger role than was apparent from looking at the sample including small jurisdictions, but it all leaves one with a very unsatisfactory feeling because the results of the two samples, although not inconsistent, are so different as to leave great doubt about their meaning.

It is all very well to note that observed national effects are representative of the minimum relative importance national forces could have, but it is unsatisfactory to have such a large interval available for that minimum. Variance components turn out to be very sensitive to jurisdiction size. It is time to turn to some methods of examining the data which are less so.

Chapter IV
Regression

Upon reflection, it is clear that the variance components examined in the previous chapter combine two rather disparate types of analysis and attempt to summarize both under a single set of figures. One is cross-sectional analysis, and the other is analysis of a time series. The sentences below do not describe the relationships with mathematical rigor, but what happens is roughly as follows: The variance across jurisdictions for each year is, in effect, measured and calculated. The average of these measurements becomes the variance attributable to the local level. It is, in other words, an average of cross-sectional variances. The mean crime rate of each year is measured, and the variance of those means over a period of years becomes the national effect. Means of each state are taken and their variances are averaged to become the state effect. Adjustments are then made to fully remove any statistical influences of local or state variances upon variance of crime rates at the next higher (state or national) level.

Purely cross-sectional variance is thus "local" and, under the model, local effects are "fixed." That is, the model takes no account of differences in local effects from one year to the next. Instead, the measured local variances are averaged to get a more accurate estimate of the "real" local effects. All of this has some utility, but as a practical matter, it is hazardous to assume local effects are fixed and observed differences in them from one year to the next are due to sampling error.

Lack of interpretablility provides another limitation on analysis of variance components. It is hard to say just what the absolute size of a variance component means. Consequently, we are limited to examining the sizes of variance components relative to each other. That is not the cause of too much distress in the case of this study, because relative sizes are exactly what the research was originally intended to examine. However, there is some ambiguity even in the meaning of the relative sizes. In a straightforward analysis of variance, each

"treatment" would have associated with it a variance which could be taken as a proportion of the total variance in the dataset. In the algorithm derived by Stokes, the components do not add up to the total variance so neatly. The variance components thus give us information we did not previously have, but they do not tell us everything we would like to know.

It is one function of statistics to summarize information so it can be understood. Unfortunately, to summarize we must throw away information, and if we summarize too succinctly we may confuse or mislead ourselves. For some purposes, variance components summarize too many concepts at the same time. It may be helpful to be less succinct.

We can extend and refine the analysis allowed by examination of variance components through the use of some simple multiple regression equations. If we treat local crime rates as dependent variables and state and national crime rates as independent variables, we can separately examine the variance in local crime rates over time, and the national and state contribution to them. This will neglect the cross-sectional analysis for the time being.

It is essential to emphasize that the national and state rates are not to be taken as causal variables in themselves, but as indices of other variables.[1] Furthermore, this analysis is somewhat unorthodox in that the variables the indices measure are unknown. Some combination of common sense and reason tells us that the real causal variables must exist, but what they are, or even how many significant ones there are, is a problem left for some other analyst. What the pattern of association between the local crime rates and the indices <u>can</u> tell us, however, is where, in general, the causal variables are to be found and how important they are.

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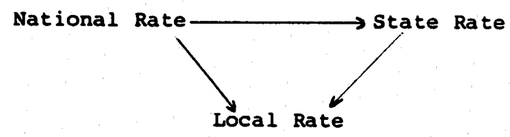
[1]Our situation is actually a bit messier than this statement implies. We are using reported rates, which are indices of real rates, which are in turn indices of other variables.

The simple model to be here examined actually consists of two equations:

(1) $StateRate = a_1 + b_{12}NationalRate$

(2) $LocalRate = a_3 + b_{32}NationalRate + b_{31}StateRate.$

The path of forces represented by the above equations is illustrated diagramatically below in illustration V-1 below.



This model assumes no influence of any level of government on any level above it. In reality there must be at least one small influence, if only in a statistical sense, in that each jurisdiction's totals make some contribution to state and national totals, and each state's totals make some contribution to national totals. However, this is a negligible influence, on average, and should not be expected to have any substantial impact.

The state crime rates and the national crime rate used here have a different meaning than they did in the section on variance components, where they meant the average of the rates of the sampled jurisdictions within the states or the nation respectively. They were therefore only estimates of state and national reporting rates, and it was important to take account of the effect of the lower level upon the upper level. It is, for instance, particularly obvious that if only two jurisdictions are measured in a state, the state estimate will be highly dependent on each. Stokes equations took account of this by calculating estimates of these contributions, but that sometimes can create such anomalies as negative estimates of variance. In this phase of the analysis, we are able to use independent estimates of the state and national rates, based on all the Uniform Crime Reports sent to the FBI, rather than just those from jurisdictions sampled for this study.

Each equation is bound to yield fairly unstable coeffients, because for each state and each local jurisdiction only the 14 measurements represented by the 14 years in the analysis have been taken. However, because there are 47 states in the analysis, and 581 local jurisdictions, the coefficients can be averaged to get stable average coefficients.

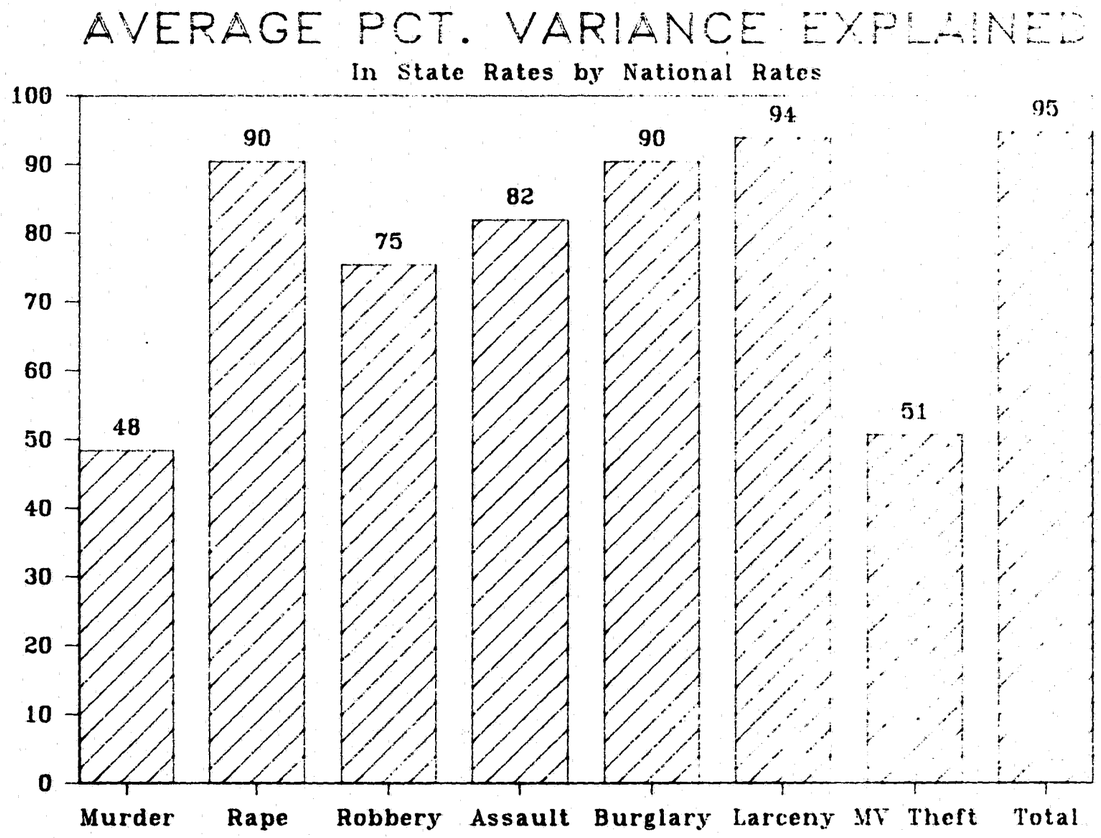
Regressing the state rates on the national rate produces correlation coefficients which are quite high. Correlation coefficients of the crimes other than murder average about .88.* The results for all crimes are given in Graph IV-1 below in terms of variance explained. High state correlations should, of course, have been expected after examination of Graph II-6, discussed in the second chapter. It should be noted that the variance explained in auto theft is significantly lower than in other crimes, thus continuing tendencies evident in the previous chapter. Unfortunately the generally high correlations of state and national rates are sure sources of later problems, since state rates and national rates are bound to be highly collinear in equation (2), making it impossible to tease out the relative sizes of the effects of state and national rates.

The amount of variance in state rates "explained" by national rates is in itself a matter of some interest. Political scientists have theorized and speculated a great deal about cultural differences between different states and regions of the United States, and the diverse patterns of behavior (including crime rates) those cultural differences spawn.[1] Nothing in the figures herein presented contradicts the findings of those studies. In fact, the regional differences visible in any cross-section (single year) which might be examined on Graph II-6

*Even in the case of murder (not shown) whose rarity tends to make its rate erratic, over 40% of the state variance is explained by national influences.

[1]Studies of political culture pervade large quantities of the literature of political science. For an explicit discussion of political culture, see Daniel J. Elazar, American Federalism: A View From the States, (New York, NY, Thomas Y. Crowell Company, 1966), Chapters Four and Five.

GRAPH IV-1


AVERAGE PCT. VARIANCE EXPLAINED
In State Rates by National Rates
100
90
80
70
60
50
40
30
20
10
0
48
90
75
82
90
94
51
95
Murder
Rape
Robbery
Assault
Burglary
Larceny
MV Theft
Total

are the very kinds of phenomena which have fueled such theories. However, the whole of Graph II-6, taken in conjunction with such results as those presented in Graph IV-1, serve to emphasize that cross-sections alone can only give us a part of the story (just as a time series alone can only give a part of the story). The forces which act upon state crime rates act in concert. To a surprising extent, they have very similar effects within each state.

The directions of the causal connections pictured in Illustration I (and implied by equations I and II) take some of the curse off the multicollinearity problem. Regression coefficients are bound to remain hopelessly entangled, but, because there are no appreciable state influences on national rates, the zero-order equations relating national and local rates while omitting state rates should come pretty close to providing the percentage of variance explained by national rates. (Let it be reemphasized that we are talking about the percentage of variance over time. Cross-sectional differences are here totally ignored.) Additional variance explained by taking account of state as well as national rates thus can be fairly compared with the variance explained by national rates alone.

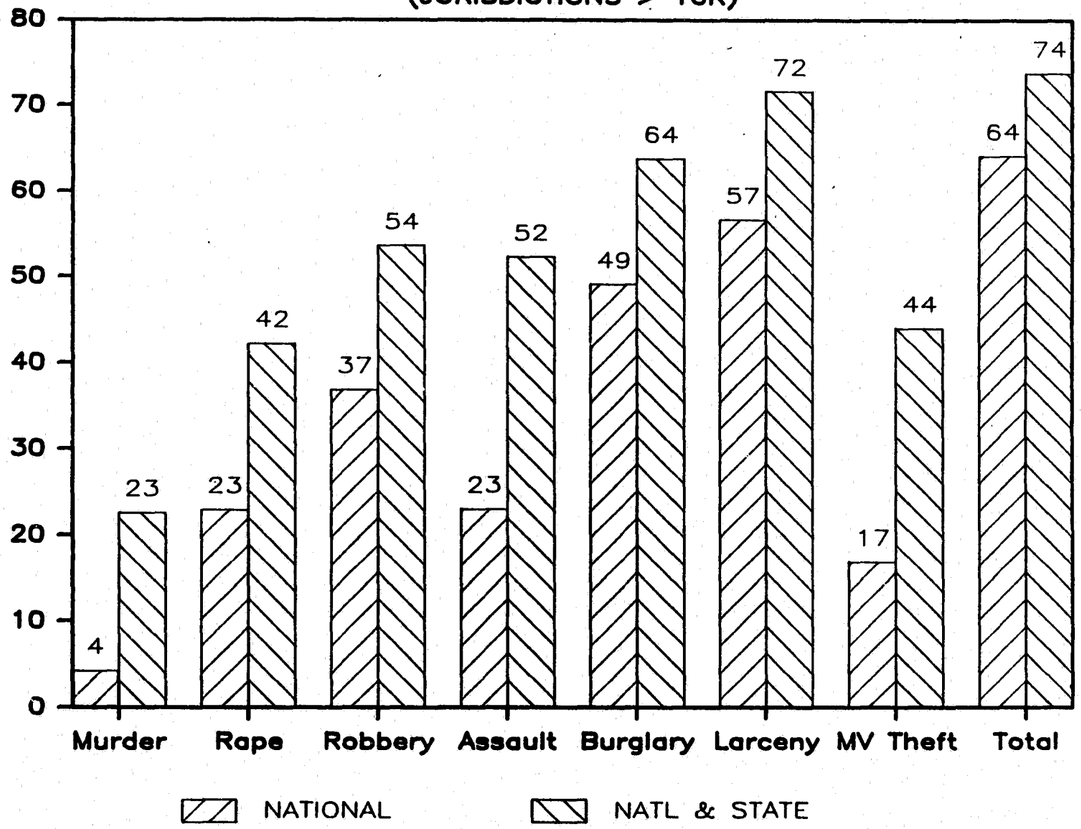
Movements of the crime rates in local jurisdictions cannot be expected to correlate as highly with national trends as the state trends do. After all, recorded rates in local jurisdictions are likely to be affected by multitudes of minor events (including changes in recording practices) which could have little effect on state and national patterns. Indeed, the correlations are not as high, but they are appreciable.

The percentage of variance in local rates explained by national effects alone and by national and state effects together is pictured in graph IV-2. As was the case when cross-sectional as well as over-time data were under analysis, national effects are in general larger than state effects. In fact, state effects in most crimes may not exist. Because we have a large number of small samples, any independent variable will appear to contribute something. The small percentage of the variance apparently

GRAPH IV-2

AVERAGE PCT. OF VARIANCE EXPLAINED

(JURISDICTIONS > 10K)



attributable to state-level influences could be a statistical artifact. Because of high multicollinearity, we cannot look at state correlations alone, and regression coefficients are too entangled to be of any help.

Any variance not explained by national and state effects can be attributed to local effects, but it must be reemphasized that those local effects include reporting differences and sampling error, just as they did when variance components were examined. Consequently, the estimates of the sizes of national and state forces should be taken as minima.

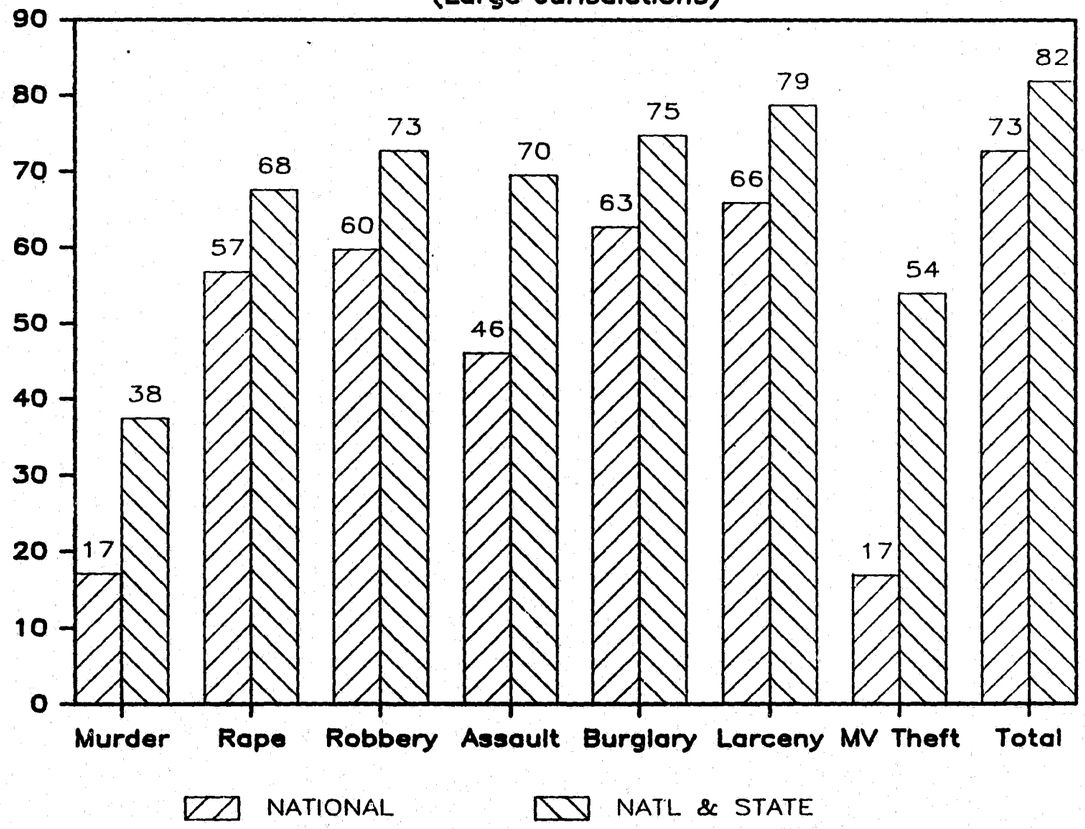
Graph IV-3 indicates that the larger jurisdictions contained in the second sample follow national trends more closely than those covered in Graph IV-2. However, the differences become quite small among the most frequent crimes--an indication that they are largely attributable to size-related statistical factors discussed in the previous chapter. Thus the sample of larger jurisdictions again tends to confirm what was learned from the smaller jurisdictions, while emphasizing that our data generally lead to an understatement of the importance of national influences.

There is a trap set by the data which is actually more likely to catch methodologically sophisticated social scientists or people experienced in trends analysis than the statistically naive. Every student has to be warned about the danger of correlating two trends over time and assuming the correlation indicates some causal connection. One cannot observe an increase in the incidence of cancer and growth in the Dow-Jones Industrial average over twenty years and conclude that one causes the other. Well-armed against committing such a fallacy, the social scientist is in danger of observing that this paper correlates two trends and conclude that it is committing the same fallacy. That is a trap. What is being observed here is the <u>same</u> thing (reported crime rates) at three different levels, and our interpretation is <u>not</u> that one causes the other, but that <u>something</u> is causing all of them. That is, we are looking for the mathematically spurious correlation social scientists usually

GRAPH IV-3

AVERAGE PCT. OF VARIANCE EXPLAINED

(Large Jurisdictions)



try to avoid. There is in fact nothing that guarantees the correlation must exist (as motor vehicle theft illustrates), but if it exists consistently enough our inference is that some (at this point unspecified) background variables must be there.

The analyses of the data in the last two chapters have produced some results which appear similar at first glance. This is not, however, because of the similarity of the mathematical model which underlies them.[2] The model has been used to examine different things. In the first case, we examined and compared cross-sectional variance and variance over time. In the second, we examined only change over time. In both cases, the inferred influence of national forces was surprisingly large, in spite of the fact that both analyses threw almost all measurement error into the local level. Consequently, the state and national effects derived had to be less than would be obtained for effects of social, economic, cultural, and policy variables operating at those levels if perfectly accurate measurements could be made.

The next chapter will be devoted to the examination of successive cross-sections. It will thus combine the examination of cross-sections and time series much as Chapter Three did. However, the mathematics are even simpler, and it will produce no single set of descriptive statistics which will attempt to summarize the relationships of all variables. As I suggested at the beginning of this chapter, that may be an advantage.

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[2]For a discussion of the model, see Jim Fennessy, "The General Linear Model: A New Perspective on Some Familiar Topics," American Journal of Sociology (Volume 74, July, 1968), pp 1-27.

Chapter V
"Nationalization"

A primary stimulus to work with variance components in voting studies has been a concern with "nationalization" of the party system. Variance components have seemed well suited to studying the question, because if national effects increased over time it could be taken as evidence that nationalization was occurring. It is a reasonable initial inference that application of the idea to the available UCR data would be unrewarding, primarily because that data covers a short span of time, and not much should be expected to occur. However, examination of the question of nationalization has yielded interesting perspectives on the data and models examined in previous chapters.

Those who have examined the question seriously discovered long ago that it is no easy task to define "nationalization" in a way satisfactory to everyone or sufficient to fit all the research with which the term has been burdened.[1] Two apparently (but only apparently) straightforward conceptions have been suggested which lend themselves to empirical research. The first would hold that nationalization occurs if different parts of the country (or states, or districts, or local jurisdictions) become increasingly responsive to events on the national level. This would be observed using variance components (other things remaining equal) if the relative size of the national component increased. Unfortunately, the relative size of the national component could increase either because national effects become greater or because state and local effects become weaker. Not everyone has to agree that both of those phenomena should be considered "nationalization," so the way is open to endless (and fruitless) semantic arguments.

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[1]Claggett, Flanigan, and Zingale, in "Nationalization of the American Electorate," give a fairly extensive discussion. The discussion which follows in this report will add a few complications to those they perceived. See Claggett et al, pp. 80 ff.

"Nationalization" might also be considered to occur if different parts of the country (or states, or districts, or local jurisdictions) exhibit increasingly similar characteristics--that is, begin to vote in the same way or, in our case, begin to have increasingly similar crime rates. At first blush, it would seem that this might be just one aspect of nationalization, with the first concept stated (increasing size of relative national effects) being another aspect, and everyone happy when one aspect or the other or both could be examined. Clagget, et al summarize this by saying "..the concept of nationalization has more than one dimension."[2] What no one seems to have noticed is that the two conceptions are actually contrary to each other in certain respects. If two jurisdictions with dissimilar crime rates are both responsive to national events in the same way, their crime rates will rise and fall together. Presumably, the more closely their movement is linked, the more "nationalized" they both are. However, if they are to move toward identical crime rates, they can no longer exhibit identical rises and falls in crime rates until they have attained identical rates. Differently stated, they cannot simultaneously move in parallel and toward each other.

"Nationalization" thus turns out to be a term more likely to produce confusion than enlightenment. However, the term at least raises interesting questions. It would be nice to know if jurisdictions were becoming more alike in certain respects, and, if so, in which respects--in their responsiveness to national events or in the levels of their crime rates, for instance. Even though it covers a span of only fourteen years, the data gathered for this project turn out to be quite useful for investigating whether or not crime rates are becoming more alike throughout the country.

If crime rates are becoming more alike, they should be clustering closer to a mean, so a straightforward measure of dispersion should be useful in measuring their similarity at

[2]Claggett, et al, p. 84.

different times. One can measure variance across jurisdictions in each of the fourteen years for which data is available. A plot of the variances will then nicely illustrate any trends.

Graph V-1 is such a plot, but it certainly disappoints any expectations of increasing similarity. Variances increase between 1967 and 1980. Moreover, they don't merely increase, they skyrocket dramatically. It would appear that crime rates are becoming ever more diverse.

What is happening here? Actually, the curve in Graph V-1 should look quite familiar. It has the same general shape as the graphs of national rates examined in Chapter II. It will be remembered that crime rates increased dramatically during the same period, and it turns out that the ways in which change can occur are more varied than envisioned by the conception with which we started this chapter. If the mean of a series of numbers increases and the variance is to stay the same, the set of numbers must change in a way equivalent to adding the same figure to each number in the set. In terms of the crime rates examined herein, that means that if variance were to stay the same, the same rate would have to be added to each existing rate.* For example, if Mayhem Central started with a robbery rate of 12 per thousand and rose to 24 per thousand by the end of the series, Peaceful Valley, starting with a rate of 2 per thousand, should be expected to rise to 14 per thousand. Stated in this way, that doesn't seem a very likely model for change. For future reference, call it Model I.**

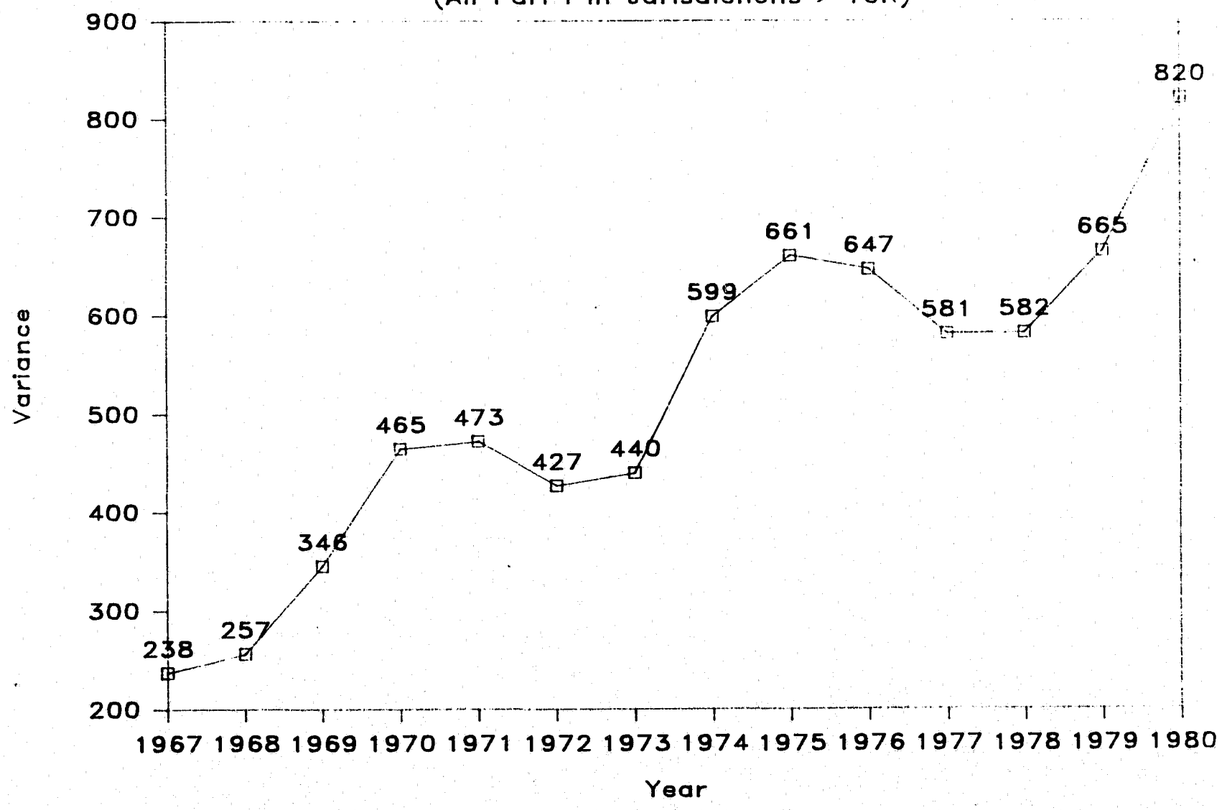
*A complex pattern of just the right increases in some jurisdictions and decreases or steadiness in others would produce the same effect, but no one would propose such a model.

**Methodological sophisticates will note that the yearly change in cross-sectional variances violates one of the assumptions underlying the analysis of variance techniques employed in Chapter Two. That is the requirement that the underlying variance under different treatments (in our case, years) be equal. That requirement exists in order to prevent the making of statements which seem to be about a single variance but are

GRAPH V-1

VARIANCE TRENDS

(All Part I in Jurisdictions > 10K)



A more intuitively appealing model--call it Model II--would have each rate expected to be multiplied by the same amount. Thus if Mayhem Central rose to 24, Peaceful Valley would only be expected to rise to 4. Note that under this model of change dispersion will increase. The two jurisdictions given as examples would start and end with a difference of 10 under Model I, but they would end with a difference of 20 under Model II. If change followed the pattern of Model II, that would explain why variance increased as it did. Under Model II, variance between two years would increase as the square of the ratio of the mean rates in those years.

We can certainly adjust for that. Graph V-2 presents a series of "adjusted" variances. Each is multiplied by the square of the inverse of the ratio of its mean to that of the first mean in the series. If change occurs as postulated by Model II, that should produce a relatively flat graph. Instead, the "adjusted variances" decline. The downward slope of graph V-2 seems as steep as the upward slope of graph V-1. However, the scaling of the graphs makes appearances deceptive in this case. Although the adjusted variances decline, they only do so by about 30 percent, whereas the ordinary variances shown in Graph V-1 increased over 300 percent. Model II, then, is much closer to what is really happening than Model I.

Is this then evidence that jurisdictions are becoming more alike? Few would be bold enough to say so. The reason is that we have lost any firm feeling for what the distribution "should" be. In any case, we have wandered a long way from the supposedly straightforward notion we started with. Graphs V-1 and V-2 are certainly not going to tell us much that is useful about such concepts as "nationalization," unless it is that the concepts are too imprecise to be useful. Until we can agree on a model, we

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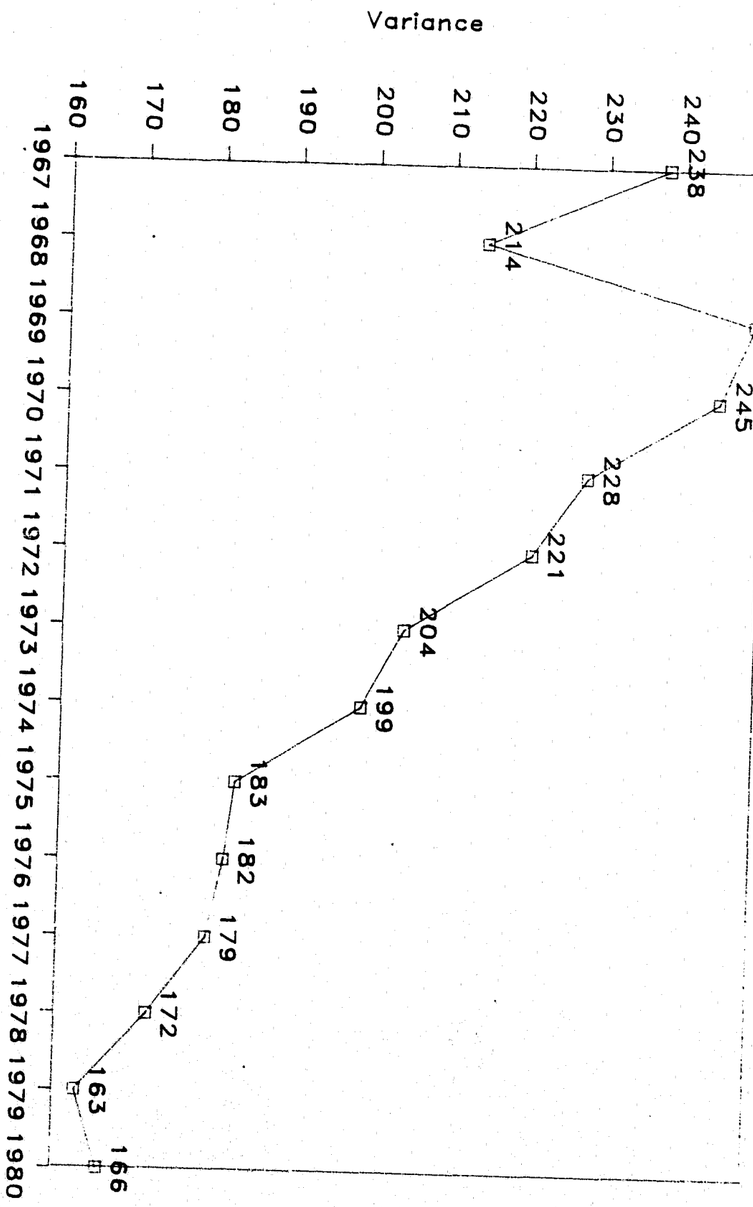
actually about a whole range of variances. However, part of the purpose of this chapter is to investigate what the national components (which are average variances) derived there are composed of. There is no need to fear that anything illicit took place as long as we recognize the limitations on what the results meant.

GRAPH V-2

ADJUSTED VARIANCE TRENDS

(All Parts of Part I in Jurisdictions > 10K)



will not even have a standard for deciding whether or not jurisdictions are becoming more alike.

A more appealing basis for comparison can be found in a Lorenz curve and accompanying Gini Index.[3] They provide a classic way of portraying and measuring inequality, but seldom find employment because they are only useful for comparisons. We have here circumstances which beg for their employment.

Graph V-3 portrays two Lorenz curves--one for the distribution of crime in 1967 and one for the same distribution in 1980. There is indeed a decline in inequality between the two years. However, what the eye discerns on this graph will not cause a flurry of letters home. This is a case, unfortunately, in which the eye is not as discerning as it might be. The Gini Indices for the 1967 and 1980 curves are .278 and .232 respectively. Inequality has declined, according to this measure by 16%, a socially significant figure for a 14-year period, but not one which appears dramatic as a difference between two Lorenz curves.*

The Lorenz Curve and Gini Index demonstrate the power of a

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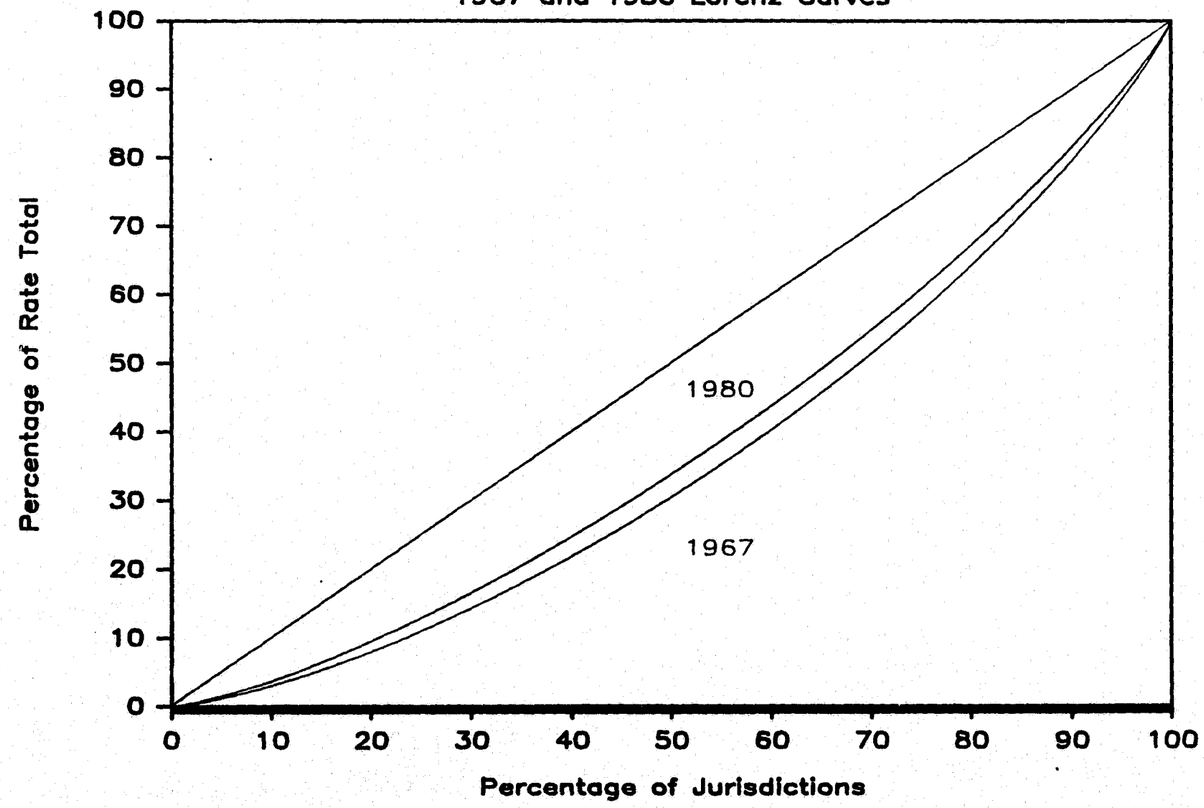
[3]For those who have encountered a Lorenz curve and retained only a vague memory of it (which seems to be just about everybody), a brief review follows. A Lorenz curve is designed to portray inequality. In its construction, data are ranked from the case possessing the least of a quality to the case possessing the most. In our study, that means from the jurisdiction with the lowest crime rate to the jurisdiction with the highest. Then the data are plotted, with the percentage of cases covered on the X axis and the cumulative percentage of the quality possessed by those cases on the Y axis. In our study, that means the percentage of jurisdictions on the X axis and the percentage of the total of crime rates on the Y axis. The curve will be further away from the diagonal as the distribution is more unequal. The Gini Index of Inequality is the percentage of the area under the diagonal which is taken up by the area between the curve and the diagonal. For a more complete discussion see Hayward R. Alker, Jr., Mathematics and Politics (New York, NY, The Macmillan Company, 1965), pp, 29-53.

*Lorenz curves comparing equality in the sample of larger jurisdictions are visually indistinguishable from the above and Gini Indices based on that sample show a decrease in inequality of about fourteen percent.

GRAPH V-3

CRIME RATE DISTRIBUTION

1967 and 1980 Lorenz Curves



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1 OF 2

model cast in intuitively appealing terms. Lorenz curves have a certain charm for those with particular kinds of tastes, but their apparent simplicity should not encourage the unwary to approach them naively. They reflect a certain notion of what change "should" be, and in fact operate in the same manner as Model II discussed above. That is, two Lorenz curves will coincide and two Gini Indices will be equal if, after the first curve is drawn, each number in the dataset on which it is based is multiplied by the same figure and a second curve based on the transformed dataset is then drawn.

As we have seen, "equality" of this kind means that there will be an increase in the absolute size of the difference between cases. Unfortunately, what satisfies the eye and the mind as equivalent may not have an equivalent social meaning. In the case of economics, it is easy to see that, even if society as a whole becomes richer, an increase in the absolute size of the gap between rich and poor is likely to bring with it a whole different (although not necessarily more severe) set of social problems. In the case of crime rates, an increasing gap between the most crime-prone and least crime-prone jurisdictions may bring differences in perception and social reaction which we have not yet even begun to understand.

In the instance portrayed, it is conceptually useful to accept Model II as the general model of change in crime rates that jurisdictions follow. However, the applicability of that model is limited by a tendency of jurisdictions to become more alike in their rates. The final meaning is that in an era of generally increasing crime rates the gap between the most crime-prone and the least crime-prone jurisdictions is increasing, but not so much as it might. None of this, of course, tells us anything about the social meaning of the change.

The second dimension of "nationalization"--increasing uniformity of response--turns out to be not easily accessible to examination with the data available for this study. Its investigation requires comparison of several time series, and

there are simply not enough sufficiently long time series within one fourteen-year span to be helpful.

This last limitation highlights the extent to which findings in this paper are time-bound. Paradoxically, the cross-sections encourage us to assume things about periods not covered in the span of years examined, because the cross-sectional differences remain fairly constant over a period of time. The time series, in contrast, contains only 14 data-points, and is not a reasonable sample of any other time series.

One consequence of all this is that it is impossible to generalize to any other time period about the relative size of national effects. That should not surprise anyone. Social scientists have always found it dangerous to generalize about one historical period on the basis of what has been learned about another. If the preceding analysis does not tell us much about what <u>will</u> be, however, it does give some information about what <u>can</u> be. It thus provides fuel for the discussion in the concluding chapter.

Chapter VI
Conclusion

The questions explored in this paper are not ones to make blood race in the veins. Moreover, the methodological explorations were necessarily pedestrian. Nevertheless, the research brings out some relationships in the sampled populations and years which were neither readily apparent nor expected before it was done: Over half the variance (both cross-sectional and temporal) in total Part I crime rates is attributable to forces emanating from the national level. Over sixty per cent of the variance in local total Part I crime rates over time is attributable to national-level forces. A search for policy-sensitive variables influencing crime rates may profitably explore variables operating at the national level. However, the pattern of changes in crime rates does not suggest a straightforward relationship with the kinds of economic variables which have often been the focus of attention in the past.

The above statements are carefully qualified. The fact that national-level forces have been important does not mean that they will always be important. Neither, however, would our inability to discern them necessarily mean that they did not exist. Data examined in this paper happened to be drawn from a period in which crime was increasing. That meant there was a significant amount of variance in the national mean, and we were able to discern that the national movements were followed on the local and state levels with a surprising degree of uniformity. We therefore learned that there <u>can</u> be large national effects. However, measurements taken in a period in which there was little change in the national crime rate would have revealed no national effects, and we would have had no way of measuring how large they could be, or perhaps were.*

*There is actually no way of being sure just how large social forces are. There is a natural tendency to assume that the absence of changes necessarily indicates an absence of forces. That assumption is false. Vast forces may be needed to maintain stasis. Unfortunately, such forces usually become visible (and measurable) only during change. Many a government has fallen as a result.

The reason it is important to understand how influential national-level forces <u>can</u> be is that, even in a period when effects of those forces are not apparent, we will have a better understanding of how things might change. In the fortunate case, we can learn how to stimulate or inhibit the change.

This study has made no attempt to discover what the national forces affecting crime rates might be. The true significance of the forces for policy-making, moreover, cannot be known until we learn what those forces are and whether they (or something else on the same causal chain) can be affected by public policy.* However, whatever they are, they are not causes we would think of as being far down the funnel of causality discussed in the first chapter. They are not so direct as the "attitude formation" Wilson faulted criminologists for dwelling upon and which he thought we have little hope of affecting (although they may indeed affect attitude formation). They are unlikely to be purely demographic, unless they involve demographic changes which are remarkably uniform throughout the United States and undergo interesting little two or three-year reversals.** They may not have what most people would think of as a "direct" effect on crime. Yet they may suggest public policy which would significantly affect crime.

Many people intuitively focus on local factors when thinking of policies which might affect crime. Such factors are often close to the tip of the funnel of causality, and they are likely to appear to be "direct" causes of crime. But as Wilson noted,

*Much of the causal analysis already done by criminologists inevitably already examines many variables whose effects are national in scope. It would be no mean task to integrate those studies with the perspective of this paper, however.

**Demographic forces which are national in scope, may, of course be influencing general trends, and their effects may from time to time be countered by other national-level forces. The point is, however, that whatever is going on is complex and interesting, and provides no justification for jumping to the conclusion that no causal connections found at that level could be amenable to policy direction.

they may be hard to regulate, or they may suggest or even stimulate action which is too expensive to be effective. Concentrating on the tip of the funnel may lead one to try to strengthen some individual family or provide counseling to some juvenile. That may be very effective for the individuals involved, and it may be an inherently good thing to do, but it may also be so expensive or hard to carry out on a wide scale that it is never implemented in a way that can have an effect on very many crimes.

The policy implications of the fact that national forces can be large may or may not be important--that depends on what the forces are. It is easy to think of nation-wide trends which might affect crime (e.g., media influences, inflation, growth of the juvenile-to-adult ratio), but hard to find variables or combinations of variables which could produce the kind of trend lines presented in Chapter II. However, it is essential that if a significant causal variable operating on the national level is found, policy makers not too easily declare it insignificant simply because it is hard to regulate. It may suggest some action other than direct national regulation.

Suppose, for instance, that the rise and dominance of a youth culture is found to be important. It would be easy to say such a variable is hard to regulate and declare the finding unimportant for policy. Such a factor would be affected by the number of adolescents, which is determined by birth rates, and those certainly cannot be regulated by criminal justice agencies. But a national youth culture is promulgated by mass media, and even if that can be little affected, counter-cultural moves can be made--perhaps most easily at the local level. Things as simple as alternative forms of recreation or recreational activities closely integrated with adult activities (in which adult norms predominate), might be found effective.* An important point of the illustration is that a national influence need not always be met with a national-level response.

*It should not be pretended that this is a practical suggestion. If practical suggestions could be dredged up so easily, causal analysis would not be necessary.

This paper more frequently raises questions than provides answers, and it is therefore certain to produce some frustration. Social science seeks explanations of phenomena, and no political scientist can be satisfied to end with the observation of effects. Nevertheless, it is necessary to start with the observation of effects, and this paper has been composed as a start. If the frustration stimulates some needed research and thus assists those who do the causal analysis upon which good policy must finally rest, it will have served its purpose.

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