

1986


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### Recommended Citation

David F. Greenberg, Ronald C. Kessler, Colin Loftin, Social Inequality and Crime Control, 76 J. Crim. L. & Criminology 684 (1985)

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## SOCIAL INEQUALITY AND CRIME CONTROL\*

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### I. INTRODUCTION

Almost all quantitative research on the determinants of variation in the allocation of public resources to crime control is done within the framework of either rational public choice theory or conflict theory. The rational public choice theory is rooted in notions of economic efficiency, social consensus, and relatively conflict-free democratic political processes. The conflict theory views conflicting interests, exploitation, and differences in power as the essence of politics. Rarely, however, has research tested the relative ability of the two theories to explain political outcomes. This study is an attempt to carry out such a test by considering the sources of variation in the size of urban police departments over time.

#### A. PREVIOUS WORK IN THE RATIONAL PUBLIC CHOICE TRADITION

Rational public choice theory assumes that communities allocate resources to law enforcement agencies (and other government activities) on the basis of majority rule and rational individual choice.<sup>1</sup> The theory envisions authorities making decisions accord-

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\* Part of this research was funded under Grant No. 80-IJ-CX-0062 from the National Institute of Justice. Points of view are those of the authors and do not necessarily reflect the position of the U.S. Department of Justice. We thank Sally K. Ward and Reynolds Farley for providing us with software and technical assistance used in calculating the measures of income inequality. We also are grateful to Brian Wiersema for assistance in other phases of the data collection and analysis. Authors' names are listed alphabetically.

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<sup>1</sup> See, J. M. BUCHANAN & G. TULLOCK, *THE CALCULUS OF CONSENT* (1962); A. DOWNES, *AN ECONOMIC THEORY OF DEMOCRACY* (1957); Bergstrom & Goodman, *Private*

ing to the "demand decisions" of the majority of voters as expressed in an open and unrestricted electoral process. For example, Borcharding and Deacon write that:

Citizens are assumed to be informed about the costs and benefits of government spending. The median voter, whose position is known definitively *ex post* and is speculated upon by political entrepreneurs *ex ante*, chooses the level of spending by voting for candidates who offer him the most efficient set of public services and taxes. This, in turn, implies that successful candidates are those who propose platforms that bring the median voter's marginal tax price in line with his marginal benefit.<sup>2</sup>

Sociologists have criticized rational choice theory for its unrealistic assumptions about the distribution of political power and the availability of information.<sup>3</sup> They also think the theory's assumption that self-interested individual decisions produce collectively rational outcomes is unrealistic. Despite these criticisms, rational choice theory has had considerable influence on empirical research on crime control. Many investigators have assumed that governments respond to increased crime by allocating additional resources to the police, thereby reducing each citizen's chance of becoming a victim.<sup>4</sup> Moreover, while some studies have failed to confirm that police budgets rise in response to increased crime,<sup>5</sup> a number of others have done so.<sup>6</sup> Yet in failing to account for all sociological variables, particularly those whose relevance is suggested by conflict theory, some of these studies raise questions about the possible spurious-

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*Demands for Public Goods*, 63 AM. ECON. REV. 280 (1973); Borcharding & Deacon, *The Demand for the Services of Non-Federal Governments*, 62 AM. ECON. REV. 891 (1972); Ehrlich, *Participation in Illegitimate Activities: A Theoretical and Empirical Investigation*, 81 J. POL. ECON. 521 (1973).

<sup>2</sup> Borcharding & Deacon, *supra* note 1, at 892.

<sup>3</sup> See, e.g., W. CHAMBLISS & R. SEIDMAN, *LAW, ORDER, AND POWER* (1985).

<sup>4</sup> Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169 (1968).

<sup>5</sup> Jones, *The Impact of Crime Rate Changes on Police Protection Expenditures in American Cities*, 11 CRIMINOLOGY 516 (1974); Loftin & McDowall, *The Police, Crime, and Economic Theory: An Assessment*, 47 AM. SOC. REV. 393 (1982); McDowall & Loftin, *Conflict, Crime and Budgetary Constraint: A Study of Police Strength in Detroit, 1927-1976*, in *THE POLITICS OF URBAN FISCAL POLICY: STABILITY AND CRISIS IN AMERICAN CITIES, 1860 TO THE PRESENT* (T. J. McDonald & S.K. Ward eds. 1984).

<sup>6</sup> Greenwood & Wadycki, *Crime Rates and Public Expenditures for Police Protection: Their Interaction*, 31 REV. SOC. ECON. 138 (1973); Land & Felson, *A General Framework for Building Dynamic Macro Social Indicator Models: Including an Analysis of Changes in Crime Rates and Police Expenditures*, 82 AM. J. SOC. 565 (1976); McPheters & Stronge, *Law Enforcement Expenditures and Urban Crime*, 27 NAT'L TAX J. 633 (1974); Swimmer, *Measurement of the Effectiveness of Urban Law Enforcement—A Simultaneous Approach*, 40 S. ECON. J. 618 (1974) [hereinafter cited as *Urban Law Enforcement*]; Swimmer, *The Relationship of Police and Crime: Some Methodological and Empirical Results*, 12 CRIMINOLOGY 293 (1974).

ness of their findings.<sup>7</sup>

The classical functionalist writings of Durkheim<sup>8</sup> and Mead<sup>9</sup> have had a much greater influence on sociological analyses of the allocation of public resources to crime control.<sup>10</sup> These theories, however, have also proved unsatisfactory. They give exaggerated emphasis to the expressive and symbolic aspects of reactions to deviance, an emphasis that implicitly neglects the instrumental dimension to this response. In assuming that a wide consensus of values prevails in modern societies, these writings, like those of the rational choice theorists, make unrealistic assumptions about the workings of the political process. Furthermore, these writings assume that deviance and social control form a self-regulating or homeostatic system largely uninfluenced by other social variables. These assumptions are naive, empirically unwarranted,<sup>11</sup> and unhelpful in explaining cross-sectional variation in social control among different jurisdictions or societies. Additionally, consensus theories have been interpreted as predicting that temporal variation in public social control will be cyclical.<sup>12</sup> Yet this pattern is only one of several seen in modern societies.<sup>13</sup>

#### B. PREVIOUS WORK IN THE CONFLICT TRADITION

Conflict theorists have also been concerned with the allocation of public resources to crime control,<sup>14</sup> but they make very different assumptions about the political processes through which these decisions are made. They differ particularly about the role of social differentiation and stratification in political decisions about crime control. Conflict theorists characterize society as normatively heterogeneous. Different groups have different moral standards and in-

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<sup>7</sup> Greenwood & Wadycki, *supra* note 6; Swimmer, *Urban Law Enforcement*, *supra* note 6.

<sup>8</sup> E. DURKHEIM, *THE DIVISION OF LABOR IN SOCIETY* (1964).

<sup>9</sup> Mead, *The Psychology of Punitive Justice*, 23 AM. J. SOC. 577 (1918).

<sup>10</sup> Blumstein, Cohen & Nagin, *The Dynamics of a Homeostatic Punishment Process*, 67 J. CRIM. L. & CRIMINOLOGY 317 (1976).

<sup>11</sup> Berk, Rauma, Messinger & Cooley, *A Test of the Stability of Punishment Hypothesis: The Case of California*, 46 AM. SOC. REV. 805 (1981); Greenberg, *The Dynamics of Oscillatory Punishment Processes*, 68 J. CRIM. L. & CRIMINOLOGY 643 (1977); Jankovic, *Labor Market and Imprisonment*, 8 CRIME & SOCIAL JUSTICE 17 (1977); Yeager, *Unemployment and Imprisonment*, 70 J. CRIM. L. CRIMINOLOGY 586 (1979).

<sup>12</sup> Blumstein, Cohen & Negrin, *supra* note 10, at 320.

<sup>13</sup> Greenberg, *Penal Sanctions in Poland: A Test of Alternative Models*, 28 SOC. PROBS. 194 (1980).

<sup>14</sup> W. CHAMBLISS & R. SEIDMAN, *supra* note 3; B. KRISBERG, *CRIME AND PRIVILEGE: TOWARD A NEW CRIMINOLOGY* (1975); R. QUINNEY, *THE SOCIAL REALITY OF CRIME* (1970); A. TURK, *CRIMINALITY AND LEGAL ORDER* (1969); Michałowski & Bohlander, *Repression and Criminal Justice in Capitalist America*, 46 SOC. INQ. 95 (1976).

terests. Those groups with greater power and resources tend to prevail in the political process. It is their definitions of crime that legislation reflects, and it is their interests and values that determine the size and policies of law enforcement agencies. Crime control is not assumed to be in the interests of the entire population equally, nor is it assumed to be the only function served by the criminal justice system. The conflict theorists have also given attention to its role in political repression.

Whatever its limitations, the conflict perspective is more realistic about the political processes involved in collective responses to crime than the rational choice approach. The few empirical studies that have drawn on this perspective, though, suffer from theoretical and methodological deficiencies.<sup>15</sup> The present study analyzes temporal variations in the size of urban police departments in recent decades while taking care to avoid these deficiencies. Additionally, the predictions of conflict theory and rational choice theory are compared.

One of the first quantitative studies to use conflict theory to analyze the size of urban police forces was carried out by Jacobs.<sup>16</sup> He conducted a cross-sectional analysis of data for police employment, economic inequality, and a set of control variables to test whether the size of metropolitan police forces is positively associated with the level of economic inequality in a metropolitan area. He proposed that these variables were positively related based on the assumption that politically influential elites prefer large police forces to discourage the poor from threatening their property. These threats are presumably greater when economic inequality is larger.

Jacobs tested this proposition with data for a sample of SMSAs (Standard Metropolitan Statistical Areas) for the years 1960 and 1970. He found some support for the proposition for 1960 (coefficients had the predicted sign in all specifications, but were statistically significant at the .05 level in only some of them) and stronger support in 1970 (all coefficients had the predicted sign and were statistically significant).<sup>17</sup> Jacobs also found that police forces were larger where the black population was a larger proportion of the total.<sup>18</sup> The coefficients, however, for this influence were smaller than those for inequality, and were significant only in 1970.

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<sup>15</sup> See *infra* notes 16-23 and accompanying text.

<sup>16</sup> Jacobs, *Inequality and Police Strength: Conflict and Coercive Control in Metropolitan Areas*, 44 AM. SOC. REV. 913 (1979).

<sup>17</sup> *Id.* at 920-21.

<sup>18</sup> *Id.*

Jackson and Carroll<sup>19</sup> studied the relationship between per capita police expenditures and the percentage of blacks in a city's population from a similar perspective. They based their analysis on a sample of 90 cities outside the South for which data on civil rights activity were available. They developed a simultaneous equation model for the joint dependence of per capita expenditures on police<sup>20</sup> in 1971, the per capita total index crime rate for the years 1968-1970, and the per capita city revenue for 1970-1971. The analysis disclosed a curvilinear relationship between police expenditures and the percentage of blacks: the relationship was positive when blacks were in the minority, and negative when in the majority.<sup>21</sup> This nonlinearity suggests that the perception of threats from blacks is positively associated with the size of the black population. When blacks become a majority, however, they are able to use their numbers politically to block the further increases that would ordinarily ensue from this perceived threat.

Jackson and Carroll also found that the relationship between police spending and the ratio of black to white median income was negative.<sup>22</sup> This suggests that the white response to blacks is influenced by racial differences in economic status. When the economic differentials between the races are especially large, whites see blacks as more threatening.

Liska, Lawrence and Benson<sup>23</sup> used a sample of 109 U.S. cities having a population of at least 50,000 in 1970 (with one exception) to study the relationship between the percentage of nonwhites<sup>24</sup> and police employment. In addition to carrying out five cross-sectional analyses for the years 1952, 1957, 1962, 1967, and 1972, they estimated two-wave panel models with various lags.<sup>25</sup> These two ap-

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<sup>19</sup> Jackson & Carroll, *Race and the War on Crime: The Sociopolitical Determinants of Municipal Police Expenditures in 90 Non-Southern U.S. Cities*, 46 AM. SOC. REV. 290 (1981).

<sup>20</sup> Jackson & Carroll, *supra* note 19, analyzes police budgets; Jacobs, *supra* note 16, and Liska, Lawrence & Benson, *Perspectives on the Legal Order: The Capacity for Social Control*, 87 AM. J. SOC. 413 (1981) analyze police employment. However, the bulk of police expenditure is for salaries, so that the findings of these studies can be compared directly. Feinberg, *Does Crime Control Pay? The Impact of Crime Control Resources on Crime Rates* (1980) (unpublished manuscript) found that the correlation between per capita and police employment in a sample of 495 U.S. cities was 0.93 in 1971.

<sup>21</sup> Jackson & Carroll, *supra* note 19, at 300.

<sup>22</sup> *Id.* at 299.

<sup>23</sup> Liska, Lawrence & Benson, *supra* note 20.

<sup>24</sup> Although percent nonwhite does not coincide exactly with percent black, the discrepancies are not large because Hispanics are classified as white in the U.S. census. In 1970, the correlation between the two indicators was 0.99 in the South and 0.98 in the non-South. *Id.* at 415.

<sup>25</sup> Their models were estimated with various lags, but they do not indicate whether the results were similar when different lags were employed. The results presented in

proaches consistently showed that the percentage of nonwhites began to have an appreciable effect on police size in the South in 1972 and outside the South in 1967.<sup>26</sup> They also presented indirect evidence suggesting that these effects were almost entirely generated by the fear of crime.<sup>27</sup> In other words, a high percentage of nonwhites is associated with greater fear of crime, which leads to higher levels of police employment. Since the analysis controlled property crime and personal crime rates, the association between fear and percentage of nonwhites is not entirely due to higher crime rates among nonwhites. In this sense there is an irrational component to the fear of crime.

Although each of these three studies finds partial support for a conflict perspective, each also raises questions about the interpretation of its findings. One question concerns the theoretical coherence of that perspective. Beirne, for example, has pointed out that some versions of the conflict perspective are predicated on elite preferences for repressing social subordinates.<sup>28</sup> Few have explained the existence or utility of these preferences. The explanations that have been offered tend to be unconvincing. Jacobs' assertion that propertied interests are more threatened as inequality increases is not backed up with reasons to expect this to be so.<sup>29</sup> Jacobs' assumption that marginal changes in police employment improve police ability to protect upper class interests is also untested.<sup>30</sup> Furthermore, he does not present any evidence that moneyed elites in the cities of his sample want more police, or that they are instrumental in persuading the city government to hire more. Since it has not always been true that local capitalist elites have favored expanding the size of police forces,<sup>31</sup> Jacob's point

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one of their tables used a seven-year lag: the five years between contiguous data collections plus a two-year lag built into each cross-section. *Id.* at 422.

<sup>26</sup> *Id.* at 422.

<sup>27</sup> *Id.* at 423-24.

<sup>28</sup> Beirne, *Empiricism and the Critique of Marxism on Law and Crime*, 26 *SOC. PROBS.* 373 (1979).

<sup>29</sup> There was little reason to expect a relationship between inequality and threat to property prior to Jacobs' analysis. The evidence developed by Spilerman is especially important in this respect. See Spilerman, *Structural Characteristics of Cities and the Severity of Racial Disorders*, 41 *AM. SOC. REV.* 771 (1976); Spilerman, *The Causes of Racial Disturbances: Tests of an Explanation*, 36 *AM. SOC. REV.* 427 (1971); Spilerman, *The Causes of Racial Disturbances: A Comparison of Alternative Explanations*, 35 *AM. SOC. REV.* 627 (1970). He found the occurrence and severity of racial disorders in American cities to be essentially unrelated to the relative deprivation of the local black population.

<sup>30</sup> See Jacobs, *supra* note 16, at 916.

<sup>31</sup> Local business leaders of late nineteenth century cities in the industrial northeast often opposed expansion of police forces because they did not want to pay higher taxes. They typically changed their minds only in the aftermath of major strikes or riots. See S.

bears closer examination.

Jackson and Carroll's conclusion that police spending is influenced by a perceived racial threat is plausible, as police departments often put down urban rebellions and riots during the mid-1960's.<sup>32</sup> Yet conflict theorists have failed to show that urban black populations are strongly opposed to the police. Evidence of such opposition would strengthen a conflict interpretation of the relationship between race and police force strength.

A second question raised by these studies concerns the specification and estimation of equations used in them. By using conventional multiple regression techniques, Jacobs implicitly assumes that all of his explanatory variables, including crime and income inequality, are exogenous to police employment. Yet if police employment reduces crime (e.g., through general deterrence), his estimates for the influence of these variables on police strength are biased.<sup>33</sup>

Jacobs' treatment of income inequality as exogenously determined is especially problematic. He holds that under conflict theory, economic elites prefer relatively high levels of police strength because the police insure that "asymmetrical exchange relationships will not be disturbed."<sup>34</sup> It follows that such exchange relationships will be more difficult to maintain where police strength is relatively weak. Failure to take this into account could also lead to simultaneous equation bias.

Jackson and Carroll are more sensitive to the possibility of simultaneous equation bias. Their model incorporates the joint dependence of crime, police expenditures, and city budget.<sup>35</sup> Because their analysis is cross-sectional, they are forced to employ two instrumental variables to achieve identification.<sup>36</sup> To estimate their police spending equation, they utilize the Household Activity Ratio

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HARRING, *POLICING A CLASS SOCIETY: THE EXPERIENCE OF AMERICAN CITIES, 1865-1915* (1983); Harring, *Policing a Class Society: The Expansion of Urban Police in the Late Nineteenth and Twentieth Centuries*, in *CRIME AND CAPITALISM: READINGS IN MARXIST CRIMINOLOGY* 292-313 (D. F. Greenberg ed. 1981).

<sup>32</sup> Jackson & Carroll, *supra* note 19.

<sup>33</sup> In particular, if inequality raises the crime rate but has no effect on police employment, and if crime rates influence police employment positively (as is suggested by the moderate positive values reported by Jacobs for the relationship between crime rates and police employment, Jacobs, *supra* note 16), failure to take simultaneity into account in the estimate will result in a positive estimate for the partial regression coefficient representing the effect of inequality on police strength even where the true value for this parameter is zero.

<sup>34</sup> Jacobs, *supra* note 16, at 923.

<sup>35</sup> Jackson & Carroll, *supra* note 19.

<sup>36</sup> *Id.* at 296.



as an instrument for the crime rate,<sup>37</sup> and region of the United States (Northeast versus Other) as an instrument for city revenues. They then assume that these instruments have no effect on police spending. The assumption that the Household Activity Ratio has no effect on police spending is reasonable, but the assumption that region has no effect on police spending is more questionable.

Jackson and Carroll argue that region is a suitable instrument for city revenues because there are historical differences between regions in attitudes toward the appropriate scope of government services and the size of governmental spending.<sup>38</sup> Even if this is so, there could be comparable regional differences in attitudes toward police spending. Ethnic and class differences in city populations and police forces, as well as differences between cities in earlier experiences with police, could make the size of police budgets vary directly by region. Regions also differ in the nature of traffic supervision tasks and in police provision of social services.

An additional problem in Jackson and Carroll's work is that the crime rate may influence the percentage of nonwhite residents in a community. The higher a city's crime rate, the more undesirable it becomes as a place for most residents to live. White city residents have greater flexibility in choosing a different residence because their greater financial assets give them a wider range of choices in the housing market, and racial discrimination limits the housing choices of nonwhites. If these processes are at work, failure to take them into account could lead to a complicated form of simultaneous equation bias in the estimation of the effect of the percentage of nonwhites police spending.

Furthermore, several other aspects of Jackson and Carroll's model specification raise questions. First, their model includes no measure of overall income inequality (although it includes the ratio of black to white median income).<sup>39</sup> This makes it impossible to distinguish between the effects of race and class, as Jacobs attempted to

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<sup>37</sup> The Household Activity Ratio, originally introduced by Cohen & Felson in *Social Change and Crime Rate Trends: A Routine Activity Approach*, 44 AM. SOC. REV. 588 (1979), is defined as the ratio of the sum of the number of married, female labor-force participants whose husband is present, to the total number of households. This is a measure of the extent to which the dispersion of household occupants enhances risk of personal and property victimization and is thus expected to be related to crime rates. Cohen and Felson provide evidence to support this expectation. Jackson and Carroll indicate that their results were similar when the Gini coefficient for income was used as an instrument for the crime rate. Jackson & Carroll, *supra* note 19, at 296. The theoretical considerations raised by Jacobs, however, clearly make this an inappropriate instrument. Jacobs, *supra* note 16.

<sup>38</sup> Jackson & Carroll, *supra* note 19, at 296.

<sup>39</sup> *Id.* at 299.

do in his earlier analysis.<sup>40</sup> Second, Jackson and Carroll do not include a measure of the average level of income in each city, despite the fact that Jacobs found this variable to be significantly related to police strength.<sup>41</sup> This omission could very well lead to omitted variable bias. Finally, by estimating a cross-sectional model, Jackson and Carroll implicitly assume that the system under study is at or close to equilibrium. Liska, Lawrence, and Benson showed this assumption to be untrue in their data by comparing cross-sectional estimates with dynamic estimates.<sup>42</sup> They found that estimates for the influence of the percentage of nonwhites on police size were larger in the cross-sectional than in the dynamic models.<sup>43</sup>

Liska, Lawrence and Benson improve on Jacobs' work by taking into account the possible simultaneity of the relationship between crime and police strength.<sup>44</sup> Other specification problems in earlier works, however, are also present in their analysis. For example, they employ no measure of the overall level of income or of income inequality, without demonstrating that these omitted variables are unimportant.<sup>45</sup>

## II. DATA AND METHODS OF THE PRESENT STUDY

This study of the relationship between race, income, inequality, and police strength seeks to overcome the limitations of the earlier studies. It incorporates measures of income inequality, the racial composition of the community, and mean income into its models. In addition, we introduce per capita city revenue into the equations as a control variable. Cities with more money to spend should logically be able to spend more on police. Since city revenues may be related to the percentage of whites and to our income variables, it is necessary to include this variable in the model to avoid omitted variable bias. We introduce two indicators of the crime rate so that we can test the rational choice theory prediction that budgets respond to changes in crime rates. We take into account the possibility that some of the variables treated as exogenous in the earlier studies are determined within the model. Additionally, we estimate our models separately for the South and non-South to see whether the effects of race and income inequality vary with region.<sup>46</sup> Race relations have

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<sup>40</sup> See Jacobs, *supra* note 16.

<sup>41</sup> Jackson & Carroll, *supra* note 19, at 299.

<sup>42</sup> Liska, Lawrence & Benson, *supra* note 20, at 418-423.

<sup>43</sup> *Id.* at 419-22.

<sup>44</sup> *Id.*

<sup>45</sup> *Id.*

<sup>46</sup> We used the definition of the South adopted by the U.S. Bureau of the Census,

been sufficiently distinctive in the South to warrant separate analyses of any phenomenon involving racial conflict.

#### A. DATA

To determine the effect of a community's racial composition and distribution of income on the strength of its police force, we analyze data for these variables and for crime rates for the years 1950, 1960, 1970, and 1980. The sample consists of all cities in the United States with a population of at least 50,000 in 1960 ( $N = 310$ ), as well as those cities that reached this size between 1960 and 1970 ( $N = 80$ ). Because of missing data, there are only 259 communities in 1950 and 1960; only 260 in 1970; and only 252 in 1980.<sup>47</sup>

Our measure of police strength is the number of full-time police employees per 100,000 residents. Since communities may respond differently to property crime and to personal crime (crimes of actual or potential violence), we distinguish between rates of personal crime (per capita rates of non-negligent homicide, aggravated assault, and robbery)<sup>48</sup> and rates of property crime (per capita rates of burglary, grand larceny, and motor vehicle theft). Other variables included in our model are the percent of the population that is nonwhite, the mean family income, and the total city revenue per capita. The analysis uses two measures of family income inequality, the standard deviation of the family income distribution and the Gini index.<sup>49</sup> Sources for these data are given in Appendix A.

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which classifies the following states as Southern: Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. U.S. BUREAU OF THE CENSUS, STATISTICAL ABSTRACTS OF THE UNITED STATES: 1976, 11 (1976).

<sup>47</sup> The omission of Lake Charles, La. from the analysis accounts for the difference in sample size between the 1950-1960 panel and the 1960-1970 panel. We excluded Lake Charles because it reported total revenue of zero in 1950, obviously a mistake. The only 1980 variable we used is police force size. Eight other cities failed to report police employee data for that year, reducing the sample from 260 to 252 for this time period. Although the population of Washington, D.C. exceeded 100,000 during the years of our panel, we also omitted it from the sample. As the nation's capital, it has unique needs for police—for tourism, federal buildings, and foreign embassies. In addition, its budget during the years of our study was determined by Congress rather than by local government. The process by which the District of Columbia's police budget was set was therefore very different from the processes envisioned by Jacobs, or the processes in other U.S. cities.

<sup>48</sup> We exclude rape from our personal crime index because it was not reported in 1950. Excluding this offense should help to improve the reliability of our measure.

<sup>49</sup> Calculations for each city were done following procedures similar to those used by the U.S. Bureau of the Census. The mean of the upper open-end interval was estimated by fitting a Pareto curve to the cumulative income distribution in each city. A default value was assigned where the frequencies in the open-end interval equalled or exceeded those in the adjacent interval, and where the fitting procedure produced an extreme

**TABLE 1**  
**DETERMINANTS OF POLICE STRENGTH**  
**PARTIAL REGRESSION COEFFICIENTS[A]**

VARIABLES	1950-1960		1960-1970		1970-1980	
	SOUTH (N=73)	NON-SOUTH (N=186)	SOUTH (N=74)	NON-SOUTH (N=186)	SOUTH (N=73)	NON-SOUTH (N=179)
CONSTANT	-187.86	520.79*	258.22	270.49	-20.26	333.71
POLICE STRENGTH (LAGGED)	1.011* (.773)†	.783* (.664)	.645* (.628)	.875* (.670)	.736* (.627)	.887* (.849)
VIOLENT CRIME RATE	-.647* (-.214)	-.159 (-.020)	-.220 (-.066)	.693** (.115)	.160 (.077)	.062 (.027)
PROPERTY CRIME RATE	.037 (.029)	-.041 (-.024)	.013 (.015)	-.035 (-.032)	.010 (.019)	.0008 (.002)
POPULATION	.00009 (.0223)	.0003* (.177)	.00005 (.016)	.0002* (.101)	-.00009 (-.030)	-.00008 (-.040)
CITY REVENUE PER CAPITA	1.606 (.069)	2.938* (.169)	1.000 (.080)	1.403* (.104)	.132 (.023)	.329 (-.057)
MEAN INCOME	-13.693 (-.015)	-64.715 (-.086)	.266 (.0004)	8.447 (.013)	6.534 (.012)	26.233 (.055)
INEQUALITY	45.091 (.059)	4.009 (.006)	40.384 (.094)	-5.978 (-.011)	83.062 (.130)	-19.783 (-.029)
PERCENT NONWHITE	41.102* (1.020)	27.261* (.242)	37.261* (.855)	15.388** (.172)	2.527 (.051)	4.805 (.078)
PERCENT NONWHITE SQUARE	-.898* (-1.021)	-.946** (-.162)	-.615* (-.652)	.0154 (.005)	.218 (.214)	-.113 (-.095)
R-SQUARE	.690	.797	.589	.857	.789	.762

\*Coefficients are statistically significant in a two-tailed test at the .05 confidence level.

\*\*Coefficients are statistically significant in the one-tailed test at the .05 confidence level.

†Coefficients in parentheses are standardized; those not in parentheses are unstandardized.

## B. METHOD

For each pair of waves (1950-1960, 1960-1970, 1970-1980), we

value (greater than \$40,000 in 1960, and \$75,000 in 1970). The default values were \$20,000 for 1950, \$40,000 in 1960, and \$50,000 in 1970. The extreme value rule was not applied in 1950 because there were no obvious outliers. For details of the Bureau of Census procedures, see M. F. HENSON, *TRENDS IN THE INCOME OF FAMILIES AND PERSONS IN THE UNITED STATES, 1947-1964*, U.S. BUREAU OF THE CENSUS, Technical Paper 17 (1967); H. S. SHRYOCK, J. S. SIEGEL & ASSOCIATES, *THE METHODS AND MATERIALS OF DEMOGRAPHY 365-66* (1975); U.S. BUREAU OF THE CENSUS, *U.S. CENSUS OF POPULATION: 1970 Vol. I, CHARACTERISTICS OF THE POPULATION*, Appendices 29-30 (1973).

estimated linear panel models with lagged endogenous variables, with either lagged or contemporaneous causal cross-effects among the variables of the model. The models with lagged effects are recursive, and assume that all time-one variables influence each of the variables at time-two. The cross-contemporaneous models are nonrecursive, and assume that reciprocal cross-sectional relationships are present among all the time-two variables. These non-recursive models are identified by using the time-one variables as instruments. We estimate the models under the assumption that there are no correlations among the time-two error terms. Violation of this assumption, however, will not bias our estimates.

All our models are identified, and each parameter in the models is just-identified as well.<sup>50</sup> Therefore, each model perfectly reproduces the observed correlations among the variables. As in conventional multiple regression, we are unable to test for omitted variable bias. Serial correlation of error terms, a common consequence of omitted variables, will bias our estimates. But because we estimate two-wave rather than multi-wave models, we are unable to test for its existence. Inclusion of the lagged endogenous variable does provide some assurance of reliability, since it reduces serial correlation by controlling for much of the contribution from omitted variables.

The parameter estimates for the recursive and non-recursive specifications were very similar, so we report only the estimates for the cross-lagged, recursive models. We also found that the signs and magnitudes of the essential parameters were insensitive to the choice of an inequality measure (Gini coefficient or standard deviation of income), so we only report the models in which standard deviations measure inequality.

### III. FINDINGS

Table 1 shows that the coefficient for the lagged effect of police strength is large, reflecting the high stability of this variable. The stability correlations for police strength (the correlation between police strength at times 1 and 2), which are not shown in the table, are .839 for 1950-1960, .845 between 1960 and 1970, and .857 between 1970 and 1980. With police strength this stable, there is not

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<sup>50</sup> For a discussion of the identification and estimation of these models, see R. KESSLER & D. GREENBERG, *LINEAR PANEL ANALYSIS: MODELS OF QUANTITATIVE CHANGE* (1981); Greenberg & Kessler, *Panel Models in Criminology*, in *METHODS IN QUANTITATIVE CRIMINOLOGY* 1-17 (J. A. Fox ed. 1981).

a great deal of unexplained change in police strength from one decade to the next for the other variables of the model to explain.

The evidence of Table 1 provides little support for the proposition that police strength rises in response to crime. The effects of violent crime and property crime on police strength are inconsistent in sign and, at best, moderate in magnitude. Some commentators have argued that formal legal control and informal social control are inversely related.<sup>51</sup> Since the anonymity of residents of larger cities is believed to reduce informal social control, the coefficients for population are expected to be positive. Our estimates show, however, that a city's population has no substantial and consistent effect on its level of police employment.

As expected, cities with larger revenues per capita employ more police, but this effect is smaller in more recent decades than in earlier ones. Once city revenues are controlled, mean income per capita has essentially no effect on police strength.

The parameters of greatest interest to conflict theory are those representing the effects of income and percent nonwhite. Income inequality has essentially no impact on police strength in any of the models (the largest standardized coefficient is .146 for the South in the 1970-1980 decade, with a t-statistic of only 1.17), contrary to the findings reported by Jacobs.<sup>52</sup>

Our findings for the effect of percent nonwhite on police employment differ across decades. For the 1950-1960 decade, the effect of nonwhites is curvilinear. As percent nonwhite increases, police strength increases up to a point, but then begins to decline. For the 1950-1960 decade, police strength in the South reaches a maximum<sup>53</sup> when the percentage nonwhite reaches 22.9%. However, the presence of multicollinearity between the linear and quadratic term in percent nonwhite forces us to interpret this finding with caution.<sup>54</sup> Outside the South, police strength is highest when percent nonwhite is 14.4%. For the 1960-1970 decade, the South reaches maximum police strength when percent nonwhite is 30.3%.

<sup>51</sup> D. BLACK, *THE BEHAVIOR OF LAW* 107-11 (1976).

<sup>52</sup> Jacobs, *supra* note 16.

<sup>53</sup> To find the relative extrema (relative minima or maxima) of the quadratic form  $ax^2 + bx + c$ , we note that the form can be rewritten as  $a(x + b/2a)^2 + (c - b^2/4a)$ . As the square of a real number is non-negative, this expression reaches its largest (or smallest) value when  $x = -b/2a$ . In our problem,  $x$  is a percentage, so meaningful solutions are restricted to values of  $x$  lying between 0 and 100%. If there are no relative extrema within this range, then absolute minima and maxima will be found at  $x = 0\%$  and  $x = 100\%$ .

<sup>54</sup> When the quadratic term was deleted, the linear term in percent nonwhite was negligible and not statistically significant.

Outside the South, police strength does not reach a maximum (linear and quadratic terms are both positive). For the 1970-1980 decade, none of the nonwhite terms is statistically significant. Outside the South, maximum police strength occurs when percent nonwhite is 21.3%; there is no maximum in the South.

Jackson and Carroll found statistically significant cubic terms in percent black in their cross-sectional analysis of data for a sample of non-Southern cities in 1970.<sup>55</sup> When we reestimated our panel models with a cubic term in percent nonwhite, however, the cubic term proved to be negligible and statistically insignificant at the .05 level. The discrepancy between our findings and those of Jackson and Carroll on the presence of cubic terms and the relative magnitude of linear and quadratic terms suggests that the polynomial terms in percent nonwhite might be sensitive to the sample. The distribution of nonwhites among cities is highly skewed. For example, only six of the 260 cities in our sample had a percentage of nonwhites higher than 40% in 1950. All these cities were in the South. Only one city outside the South had a percentage of nonwhites as high as 25%. As late as 1970, only four non-Southern cities had a percentage higher than 50%. Jackson and Carroll's analysis of 90 non-Southern cities must have involved few cities with a substantial nonwhite population. Since observations at extreme ends of the distribution of independent variables have a disproportionate influence on least squares estimates, there is a danger that only a few observations determine both ours and Jackson and Carroll's sets of estimates for the effects of percent nonwhite.

We investigated this possibility by examining scatter plots and introducing dummy variables in cases where a high value for percent nonwhite and police force size per capita suggested the possible presence of outliers from a linear dependence on percent nonwhite. This was done for Gary, Indiana in the 1950-1970 non-South model; for Atlanta, Georgia in the 1970-1980 Southern model; and for Newark, New Jersey in the 1970-1980 period.

In each case, our conclusions about the effects of income inequality and the other variables in the model, with the exception of percent nonwhite, remained unchanged. However, some of the estimates for the effect of percent nonwhite did change. The estimate for the linear term in the model for non-Southern cities, 1950-1960, was reduced in magnitude and was no longer statistically significant at the .05 level, even in a one-tailed test. The quadratic term became negligible. Thus, the evidence for a linear dependence on

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<sup>55</sup> Jackson & Carroll, *supra* note 19, at 300.

percent nonwhite in this model is weak, and there is essentially no evidence for an appreciable quadratic term. In the 1970-1980 models the estimates for the linear and quadratic terms remained small. As in Table 1, none of the estimates proved statistically significant at the .05 level.

We can summarize our findings about the effects of percent nonwhite on police spending as follows: in the South, percent nonwhite has significant linear and quadratic effects in the decades 1950-1960 and 1960-1970. However, multicollinearity reduces our confidence in the 1950-1960 findings. In the decade between 1970 and 1980, percent nonwhite has no appreciable effect. Outside the South, percent nonwhite has small linear and quadratic effects between 1950 and 1960, modest linear effects between 1960 and 1970, and negligible effects between 1970 and 1980.

#### IV. DISCUSSION

By itself, the finding that percent black or nonwhite has a positive linear effect on police strength is susceptible of more than one interpretation. It is clearly consistent with a conflict theory interpretation in which whites perceive nonwhites as a threat regardless of their involvement in crime, and respond to that threat by strengthening the local police force. But it is also consistent with several other possibilities. One is that nonwhites want more police. The more nonwhites there are in a city, the more successful they are in getting what they want. Another is that nonwhites need more social services than whites, and these services are often supplied by the police. Police quiet noisy neighbors, intervene in family quarrels, and deal with many other problems. Therefore, the effect of the percentage of nonwhites on the strength of the police force could result from the demands on police services rather than from a perceived racial threat.

Seemingly, it would be difficult to distinguish among these interpretations using highly aggregated statistical data that contain no direct indicators of social conflict. However, the pattern of geographical and temporal variation in the effect of the percentage of nonwhites can distinguish these interpretations. The strongest effect of percent nonwhite on police force strength occurs in the South during the years 1950-1970. It is difficult to imagine that Southern blacks favored more police during this period, since all-white Southern police enforced segregation laws during much of this time.

A recent referendum in Oakland, California also casts doubt on



the "social services" interpretation. A referendum to increase the size of the police force passed in predominantly white districts, but was defeated in predominantly black districts.<sup>56</sup> The negative quadratic terms in our models for Southern cities during the 1950-1970 time periods also weigh against the interpretation that nonwhites favor police force expansion. If nonwhites favor larger police forces, then a positive relationship between percent nonwhite and increases in police strength should prevail at all levels of percent nonwhite, not just when this variable is small.

Furthermore, if the influence of nonwhites on police strength is a result of the increased demand that nonwhites make on police services, then this effect should disappear when socio-economic indicators of demand are introduced into the model. Liska, Lawrence and Benson attempted to do that by controlling for the percentage of families below the poverty line.<sup>57</sup> Their results did not change after controlling for this factor.<sup>58</sup> Our models partially control for demands on services by controlling for the mean level of income and the inequality of income. It is conceivable that non-whites demand more services from the police for cultural reasons that are not fully controlled by our income variables. Yet this explanation is also incompatible with a negative quadratic term in percent nonwhite. Additionally, it is not plausible that nonwhites in the South most readily called on the police during the period when the police were enforcers of segregation laws.

We have suggested that the Jackson and Carroll finding—that per capita expenditures on police reached a maximum when percent black was close to 50%—may reflect the presence of one or two outliers in their data, and does not accurately portray the relationship between percent nonwhite and police force strength in non-Southern cities. In our data, the curvilinear dependence of police strength on percent nonwhite is restricted to the pre-1970 South. An interpretation of this pattern in terms of political power suggests that an interest group need not achieve a majority to influence public choices. Operating as a voting bloc, it can sway the balance with less than 50% of the votes. Yet there are reasons for rejecting a voting bloc interpretation of our findings. Black voting strength was insignificant in the South during the decade from 1950 to 1960. In the 1970's, Southern black voting strength had increased greatly,

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<sup>56</sup> *Oakland Rejects Tax Increase Despite Rising Crime*, N.Y. Times, Apr. 26, 1981, at 31.

<sup>57</sup> Liska, Lawrence & Benson, *supra* note 23.

<sup>58</sup> *Id.* at 420.

but the higher percentages of nonwhites failed to reduce police force increases.

Research by Liska and his collaborators suggests still another interpretation. Analyzing survey data on the fear of crime for 26 large cities included in the National Crime Survey for 1972 and 1973, Liska, Lawrence and Benson found that the percentage of nonwhites influences fear of crime even when crime rates are controlled.<sup>59</sup> This influence is partly direct and partly generated by the proportion of crime that is interracial. In a further analysis of the survey data, Liska, Lawrence and Sanchirico found that *nonwhite* fear of crime is influenced by percentage nonwhites in the same way as is white fear of crime.<sup>60</sup>

These findings suggest that the racial composition of a community influences fear of crime. This fear is shared by whites and nonwhites alike. Both populations evidently hold stereotypes linking nonwhites with criminality, and are consequently more afraid of crime when more nonwhites are present. The association between nonwhites and fear of crime persists even when crime rates are held constant. It follows that the observed association between growth in police strength and the presence of nonwhites could be the consequence of a concern with protection from crime, rather than the repression of nonwhites. Police force growth in response to the presence of nonwhites, even when crime rates are controlled, does not refute this interpretation. The fear of crime is determined by not only the reported crime rate, but also the percentage of nonwhites.

Unfortunately, Liska, Lawrence and Benson did not verify whether the fear of crime explained the relationship between police force strength and percent nonwhite in the 26 cities for which survey data were available.<sup>61</sup> Consequently, their interpretation remains speculative. Our own data, however, do not support their interpretation. In our study, the relationship between race and police force strength is strongest in the pre-1970 South. The relationship essentially disappears in the South after 1970. Yet crime did not become a major public issue until the mid to late 1960's. On the other hand, race relations were an extremely salient issue in the South between 1950 and 1970. It is more plausible that the relationship in this period reflects efforts by Southern whites to preserve their privileged position in the face of a challenge from the civil

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<sup>59</sup> *Id.*

<sup>60</sup> Liska, Lawrence & Sanchirico, *Fear of Crime as a Social Fact*, 60 SOC. FORCES 760, 765 (1982).

<sup>61</sup> Liska, Lawrence & Benson, *supra* note 23.

rights movement, than it reflects a fear of crime. Once Southern whites had reconciled themselves to the legal equality of the races, the relationship between race and police force strength disappeared.

The survey data analyzed by Liska, Lawrence and Sanchirico<sup>62</sup> show a curvilinear relationship between percentage nonwhite and fear of crime similar to the observed pattern in this study for police force strength. A plausible explanation for both patterns is that the perception of a threat depends on exposure. In communities where the nonwhite population is small, exposure is directly proportional to the relative size of nonwhite and white populations. Once the nonwhite population reaches a critical level, it is able to support businesses and cultural institutions that serve the nonwhite population almost exclusively, reducing the frequency of interaction between whites and nonwhites. Consistent with this reasoning, Liska, Lawrence and Sanchirico find that percentage nonwhite is positively related to racial segregation in housing.<sup>63</sup>

In contrast to the pattern in the South, the relationship between race and police force strength outside the South is weak. The linear term is statistically significant (in a one-tailed test) only for the decade 1960-1970, and it is quite modest in magnitude. In the 1960's, the police and National Guard were called upon to contain racial rebellions and riots in many non-Southern cities. It is therefore not surprising to find that percentage nonwhite had some effect on police force growth in this period. What is more striking is that the effect was so small.

## V. CONCLUSION

Our analysis finds no evidence that police force strength is related to the degree of inequality in the distribution of a city's income. This finding does not support the assertions of conflict theory. Our finding should come as no surprise to those familiar with the history of social conflict in twentieth-century America. Outside the South and Southwest, the police have not regularly contained nonracially-related attempts to alter the distribution of income since the union organizing drives of the 1930's. Since then, a combination of market forces, welfare subsidies, and taxation has regulated the distribution of income, with the role of police primarily limited to the control of theft. This is the state of affairs predicted by Karl Marx, a non-Weberian conflict theorist:

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<sup>62</sup> Liska, Lawrence & Sanchirico, *supra* note 60, at 769.

<sup>63</sup> *Id.* at 766.

The advance of capitalist production develops a working-class, which by education, tradition, habit, looks upon the conditions of that mode of production as self-evident laws of Nature. The organization of the capitalist process of production, once fully developed, breaks down all resistance. . . . Direct force, outside economic conditions, is of course still used, but only exceptionally. In the ordinary run of things, the labourer can be left to the "natural laws of production," i.e. to his dependence on capital. . . .<sup>64</sup>

As to race, our analysis confirms the existence of a moderately strong relationship between race and police force strength, but only in the South before 1970. This relationship probably reflects the instrumental use of the police by politically dominant whites to perpetuate the subordination of blacks. Outside the South, the relationship between race and police force strength was weak except between 1960 and 1970. The availability of the National Guard and Army for intervention in urban disorders may have made it possible for non-Southern cities to avoid drastic increases in police forces during that decade.

Our findings for the effect of percentage nonwhite in the pre-1970 South could be taken as a confirmation of the conflict theory position that dominant or advantaged groups in society will use law enforcement to preserve their privileged position. Our findings for non-Southern cities between 1960 and 1970 also support this claim, though the strength of the predicted relationship is at best moderate. The remaining three models, however, are not consistent with a racial-domination interpretation.

Despite these negative findings, we do not suggest that conflict perspectives are irrelevant to an understanding of urban policing. The size of the modern police force may not be its most important characteristic. The allocation of officers within the city and by function, as well as police enforcement practices (use of weapons, stop-and-search procedures, etc.), may be more controversial than the size of the police force.<sup>65</sup>

If our data only support conflict theory weakly, they fail to support rational choice theory at all. Neither violent crime nor property crime is a very strong predictor of increases in police strength.<sup>66</sup> Police strength may be more responsive to mass media

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<sup>64</sup> K. MARX, *CAPITAL, VOL. I: A CRITICAL ANALYSIS OF CAPITALIST PRODUCTION* 737 (1967).

<sup>65</sup> Sheppard, *Tension Rises in Milwaukee Over Police Conduct*, N. Y. Times, Dec. 30, 1981.

<sup>66</sup> Table 1 shows that violent crime did have a modest effect on increases in police strength during the 1960-1970 decade. Our further analyses for 1970-1980 (treating Atlanta and Newark as dummy variables) also found modest but statistically insignificant effects for the 1970-1980 decade. The unstandardized and standardized coefficients for the South in this decade were .169 and .124 respectively. Outside the South they were

coverage of crime-related events than to local crime conditions. Television and film coverage give national publicity to crimes committed in specific localities all over the country. Under these circumstances, anxiety about crime may not be strongly related to local crime patterns. Regardless, this anxiety does not help to explain differences between cities in police force strength. Likewise city revenues, which influenced police strength before 1970, had little effect later. In other words, local conditions that influenced the size of police forces before 1970 were no longer doing so afterwards, in a period of mounting national concern about crime. The weak relationship between race and police strength observed outside the South between 1960 and 1970 may similarly reflect a process by which concerns about riots were mediated by mass media, and therefore were influenced by local conditions rather than by national events.

The "democratic" picture of resource allocation drawn by rational choice theorists has little resemblance to the situation in the South before the passage of the 1964 Voting Rights Act. Blacks who were denied an effective vote by police, courts, and white supremacist groups could not influence allocation decisions, no matter how well informed they were about the costs and benefits of government spending. When allocations perpetuate the domination of one group by another, they can hardly serve the subordinate population efficiently.

High levels of dissatisfaction with the police have persisted among blacks even after racially discriminatory legislation has been repealed. This suggests that formal legal equality alone is not sufficient to guarantee the efficient provision of government services for minority populations. Even under conditions expected to be most favorable to public choice theory, group differences in political power and influence can result in outcomes discrepant from those predicted by the theory.

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.247 and .089. See Loftin & McDowall, *supra* note 5, for a finding that crime rates did not have a strong effect on the size of the Detroit police force in a time-series analysis covering the years 1926-1977.

## APPENDIX A. SOURCES OF DATA

VARIABLE	SOURCE
Crime, 1950	FEDERAL BUREAU OF INVESTIGATION, UNIFORM CRIME REPORTS FOR THE UNITED STATES AND ITS POSSESSIONS, Vol. XXI, Nos. 1 and 2, Annual Bulletin 1950, Table 35 (1951).
Crime, 1960	FEDERAL BUREAU OF INVESTIGATION, UNIFORM CRIME REPORTS FOR THE UNITED STATES—1960, Table 38 (1961).
Crime, 1970	FEDERAL BUREAU OF INVESTIGATION, UNIFORM CRIME REPORTS FOR THE UNITED STATES—1970, Table 60 (1971).
Full-time Police Employees, 1950	FEDERAL BUREAU OF INVESTIGATION, UNIFORM CRIME REPORTS FOR THE UNITED STATES AND ITS POSSESSIONS, Vol. XXI, Nos. 1 and 2, Annual Bulletin 1950, Table 12 (1951).
Full-time Police Employees, 1960	FEDERAL BUREAU OF INVESTIGATION, UNIFORM CRIME REPORTS FOR THE UNITED STATES—1960, Tables 36, 37 (1961).
Full-time Police Employees, 1970	Federal Bureau of Investigation, UNIFORM CRIME REPORTS FOR THE UNITED STATES—1970, Tables 57, 58 (1971).
Full-time Police Employees, 1980	Federal Bureau of Investigation, UNIFORM CRIME REPORTS FOR THE UNITED STATES—1980, Table 71 (1981).
Population, 1950 and 1960	U.S. Bureau of the Census, COUNTY AND CITY DATA BOOK, 1962, Table A-2 (1962).
Population, 1970	U.S. BUREAU OF THE CENSUS, COUNTY AND CITY DATA BOOK, 1972, Table 6 (1973).
Population, 1980	FEDERAL BUREAU OF INVESTIGATION, UNIFORM CRIME REPORTS FOR THE UNITED STATES—1980, Table 6 (1981).
Percent Nonwhite, 1950 and 1960	U.S. BUREAU OF THE CENSUS, COUNTY AND CITY DATA BOOK, 1962, Table 6 (1962).
Percent Nonwhite, 1970	U.S. BUREAU OF THE CENSUS, COUNTY AND CITY DATA BOOK, 1972, Table 6 (1973).
Family Income, 1950	U.S. BUREAU OF THE CENSUS, U.S. CENSUS OF THE POPULATION: 1950. Vol. 11, CHARACTERISTICS OF THE POPULATION, Table 37 (1952).
Family Income, 1960	U.S. BUREAU OF THE CENSUS, U.S. CENSUS OF THE POPULATION: 1960. Vol. 1, CHARACTERISTICS OF THE POPULATION, Table 76 (1963).
Family Income, 1970	U.S. BUREAU OF THE CENSUS, COUNTY AND CITY DATA BOOK, 1972, Table 39 (1973).