The Changing Relationship between Income and Crime Victimization

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I. Introduction

This paper explores changes in the relationship between race, income, and criminal victimization over time. Interest in this question is motivated by the widening income distribution of the last two decades. Between 1980 and 1994, the share of income earned by the top 5 percent of American families increased from 15.3 percent to 20.1 percent. Families in the bottom quintile saw their share of income fall from 5.1 percent to 4.2 percent.

Existing theories have sharply divergent predictions about how rising income inequality will affect the distribution of crime across victims.[1] The simplest version of the economic model of crime (Becker 1968) would suggest that the rich become increasingly attractive targets as the income distribution widens, leading to rising victimization of the rich relative to the poor. However, if the rich are able to engage in behavior that reduces their victimization, such as investments in security, victimization of the rich may rise or fall depending in part on the income elasticity of crime avoidance. Finally, in models such as Wilson (1987) in which the rich provide positive externalities to the poor, increased income inequality along with greater segregation by income can lead to concentrations of poverty. In this scenario, criminal victimization of the poor is likely to rise relative to the rich.

I analyze two data sets in testing these competing theories. The first of these is the National Crime Victimization Survey (NCVS), which provides summary statistics on criminal victimization based on a nationally representative sample for a wide range of crimes. The shortcomings of the NCVS are that geographically desegregated data are unavailable, and that homicide—the crime with the greatest social cost—is not included. The second data set is neighborhood-level homicide data for the city of Chicago over the last three decades. These unique data on Chicago homicides are linked to the 1970, 1980, and 1990 decennial censuses to examine the changing patterns of homicide victimization over time.

The main results of the paper are as follows: Information in the NCVS suggests that property crime victimization has become increasingly concentrated on the poor. For instance, in the mid-1970s households with incomes below $25,000 (in 1994 dollars) were actually burglarized slightly less than households with incomes greater than $50,000. By 1994, the poor households were 60 percent more likely to be burglarized than the rich households. For violent crime, however, a different pattern is observed. In

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the Chicago homicide data, homicide rates at a point in time are generally inversely related to median family income in the community. However, this relationship has substantially weakened over time for blacks and has disappeared completely for whites by 1990. This finding is particularly striking because cross-neighborhood income inequality increased substantially over the time period examined. In other words, the income gap between the richest and poorest communities grew substantially, but the murder gap shrunk. Overall, the results of this paper are consistent with predictions of the simple economic model of crime and possibly with an economic model incorporating victim precaution, but not with the Wilson (1987) study.

Before proceeding, it is worth pausing to acknowledge that the estimates presented in this paper, while perhaps interesting in their own right, are unlikely to be of direct relevance to policymaking. Given the results of this paper, the natural tendency is to calculate the extra burden borne by the poor as a result of higher crime victimization. Such a calculation, however, would ignore the fact that individuals distort their behavior in costly ways (for example, by moving to the suburbs, investing in security systems, or not going out after dark). Any measure of the burden of crime should incorporate not only the costs of those victimized, but also the investment made to avoid victimization. For example, if crime avoidance is a positive function of income (Cullen and Levitt forthcoming), then ignoring costs of avoidance will understate the true crime-related burden felt by the rich. A second possible calculation one might want to make based on the results of this paper is the distribution of income that yields the lowest level of societal crime. Because victim precaution is a function of the crime rate, this type of partial equilibrium analysis is misleading.[2]

The remainder of the paper is organized as follows: Section II provides a review of the existing empirical literature on the relationship between crime, poverty, and income inequality. Section III presents the results from the National Crime Victimization Survey. Section IV analyzes Chicago neighborhood-level homicide data. Section V offers a conclusion.

II. Literature Review

The empirical literature addressing the relationship between crime and various measures of economic deprivation (such as income inequality, poverty, and unemployment) is extensive. The brief literature review that follows does not attempt to be exhaustive, but rather, highlights various approaches to the issue. Land et al. (1990), Kovandzic et al. (1998), and Patterson (1991) provide more systematic reviews of the literature. It is important to note that the question that I pose in this paper (namely, what are the relative victimization rates of the rich and the poor and how has this changed over time?) differs in its thrust from most of the existing literature. Most of the papers discussed below focus primarily on the relationship between economic deprivation and the amount of crime in an area, without specific concern for whether the victims are poor or rich.

Broadly speaking, the existing empirical research on the topic has generally adopted one of three estimation strategies. The most common approach has been cross-sectional analyses of American cities, metropolitan areas, counties, or states. Examples of this approach are Bailey (1984), Blau and Blau (1982), Glaeser et al. (1996), Kovandzic et al. (1998), Kposowa et al. (1995), Land et al. (1990), Messner (1982), Simpson (1985), and Williams (1984). Results vary widely across these studies. In some cases, greater income inequality (Blau and Blau 1982; Kposowa et al. 1995; Sampson 1985; Simpson 1985) or increased poverty rates (Bailey 1984; Jackson 1984; Williams 1984; Land et al. 1990) are associated with higher crime rates. A number of other papers find statistically insignificant coefficients on either income inequality (Bailey 1984; Messner 1982; Williams 1984) or poverty (Blau and Blau 1982; Simpson 1985). In a few cases, the sign on poverty (Kposowa et al. 1995; Messner 1982) is reversed.

There are a number of important limitations to studies of this kind. First, they rely on officially reported crime data. Differences in police recording procedures make cross-jurisdiction comparisons troublesome (see, for example, O'Brien [1985]).[3] A second limitation of such studies is the difficulty of adequately controlling for unobserved characteristics of jurisdictions that are correlated both with income variables and with crime rates. Both of these concerns can be at least partially addressed through the use of

panel data, although this strategy has been relatively rare (one exception is Glaeser et al. [1996]). These demographic variables, however, tend to change slowly over time, so there is typically relatively little within-jurisdiction variation available to exploit.

There are two final concerns that are not alleviated through the use of panel data. One is the high degree of correlation between various measures of income and other socioeconomic variables. As an example, Table 1 presents raw correlations across Chicago neighborhoods (part of the data set analyzed in Section IV) for a range of variables using the 1990 census. The correlation between either median family income or poverty rates and other variables such as fraction of female-headed households, the local unemployment rate, percentage black, or percentage owner-occupied housing is in every instance greater than .50 in absolute value and in many cases greater than .80. Consequently, empirical estimates are likely to be sensitive to the precise set of controls used in an analysis and it is difficult to interpret the coefficients of those variables that are included. It is thus not surprising that many studies that include both measures of poverty and income inequality often find one or both of these variables statistically insignificant.

A final concern, as it relates to the particular question that I address in this paper, is that using data at the city, metropolitan statistical area, or state level, one cannot directly determine who is victimized. So, if one goal of the analysis is to identify victimization rates of rich versus poor, these analyses provide little guidance.[4] Cross-sectional studies using geographic areas such as neighborhoods and communities (Messner and Tardiff 1986; Patterson 1991) circumvent this last problem to a substantial degree. Messner and Tardiff, and Patterson, find higher poverty rates associated with greater crime rates. The use of individual-level data is another escape from this problem; Sampson (1985), using NCVS data for the years 1973-75, reports that neighborhood poverty and inequality have only a small direct impact on crime victimization.[5]

A second empirical approach relies on cross-country crime comparisons. Using official reported crime data, Fajnzylber et al. (1998) find a strong positive correlation between crime and high levels of GDP per capita and greater income inequality. All of the criticisms of cross-sectional analyses are equally applicable to international crime data, which are of poor quality, particularly in developing countries. Particularly troubling is the strong positive correlation between GDP and the propensity for victimizations to be officially recorded. Soares (1999) demonstrates that the sign on income per capita reverses when victimization data from crime surveys replace official crime reports. Notably, however, the coefficient on income inequality is not greatly affected when officially reported data are replaced by victimization survey data.

A third strategy that is sometimes adopted is the use of national-level time series variation (for example, see Allen [1996]). This paper finds that higher poverty and greater income inequality are both associated with *decreased* crime. This research approach is problematic because there

Table 1
CORRELATION ACROSS VARIABLES IN CHICAGO COMMUNITY-LEVEL DATA, 1990

Variable	Median Family Income	Poverty Rate	Female-Headed Households	Unemployment Rate	Percentage Black	Percentage Owner-Occupied	Homicide Rate
Median family income	1.00	—	—	—	—	—	
Poverty rate	-.85	1.00	—	—	—	—	
Female-headed households	-.74	.89	1.00	—	—	—	—
Unemployment rate	-.82	.91	.88	1.00	—	—	—
Percentage black	-.56	.64	.87	.78	1.00	—	—
Percentage owner-occupied	.65	.76	-.66	-.55	-.34	1.00	—
Homicide rate	-.76	.88	.87	.90	.75	-.57	1.00

Sources: All data are drawn from the 1990 census except the homicide rate, which is a ten-year average of homicides based on data compiled in Block et al. (1998).

Notes: Values in the table are cross-neighborhood correlations for Chicago neighborhoods in 1990. The standard Chicago seventy-seven neighborhood classification is used, except that the central business district is excluded.

are very few degrees of freedom available for estimation and the lack of a reasonable comparison group makes it difficult to interpret the coefficients obtained in anything approaching a causal manner.

In summary, much but not all of the existing empirical evidence is consistent with the conclusion that poverty and income inequality are associated with higher crime rates. Most of the existing literature, however, focuses on the amount of crime perpetrated rather than on how crime victimization is distributed across the poor and the rich. None of the existing literature that I am aware of has considered the way in which the link between poverty and crime victimization may have changed over time. In the following two sections, I explore these issues empirically using the NCVS and neighborhood-level data from Chicago over the 1966-95 period.

III. Evidence from the National Crime Victimization Survey

The NCVS has been conducted annually in the United States since 1973. Roughly 60,000 households are interviewed each year. Unfortunately, no geographic identifiers are available in the data, so analysis of these data is limited to national analyses.

Table 2 presents victimization rates by household income level and race for four different crimes: auto theft, burglary, aggravated assault, and robbery. The first two categories comprise serious property crimes; the latter two categories are the only violent crimes for which the NCVS generates reliable results.[6] Data are presented for the 1974-75 and 1993-94 periods. These years were chosen both because they represent (roughly) the earliest and most recent data available and because the income categories available are comparable in real terms. Survey respondents do not report actual income, but rather are only classified within relatively broad bands. For the years used, it happens to be the case that respondents can be categorized as having real household incomes of less than roughly $25,000 in 1994 dollars, between $25,000 and $50,000, and more than $50,000.[7] In the table, only low- and high-income households are reported. In virtually every case, victimization rates of middle-income households fall between victimization rates of the low- and high-income counterparts. The ratio of low-income to high-income victimizations is also reported.

Table 2
Victimization by Income Level in the National Crime Victimization Survey

		White		Black	
Crime	Income Group	1974-75	1993-94	1974-75	1993-94
Auto theft	Under $25,000	13.4	14.4	14.8	23.9
	Above $50,000	22.2	19.9	59.2	49.1
	Ratio (poor:rich)	.60	.72	.25	.49
Burglary	Under $25,000	93.7	71.3	134.9	88.6
	Above $50,000	98.6	44.9	137.4	53.0
	Ratio (poor:rich)	.95	1.59	.98	1.67
Aggravated assault	Under $25,000	13.2	16.3	16.2	20.7
	Above $50,000	7.2	7.9	7.3	16.2
	Ratio (poor:rich)	1.82	2.06	2.22	1.28
Robbery	Under $25,000	7.9	6.0	10.6	14.1
	Above $50,000	4.7	4.0	8.9	12.5
	Ratio (poor:rich)	1.68	1.50	1.19	1.12

Source: National Crime Victimization Survey (1974, 1975, 1993, 1994).

Notes: All dollar values are in (approximate) 1994 dollars. Only categorical income data are available in the survey. The income cutoff for the 1974-75 low-income category is $7,000 in nominal dollars and the cutoff for the high-income category is $15,000 in nominal dollars. The consumer price index somewhat more than tripled between 1974 and 1994.

A few key facts emerge from Table 2. First, for all crimes reported in both time periods, blacks of a given income were more frequently victimized than whites. The biggest discrepancies were for robbery and for auto theft among the rich. Blacks were roughly twice as likely to be victims of robbery, holding income constant, and rich blacks were more than twice as likely to have a vehicle stolen as rich whites. Second, at any given point in time, the poor were more likely to suffer violent victimizations, but the evidence on property crime is mixed. The higher rate of violent crime is consistent with an increased opportunity for victimization of the poor, as most criminals are themselves poor and thus will tend to live in poor neighborhoods. While there are also greater opportunities to commit property

crimes against the poor, the lower incidence of property crime in this group is consistent with the economic model of crime's prediction that (all else constant) criminals will seek out more lucrative targets.

An interesting pattern emerges with respect to victimization by income over time for property crime. For both races, property crime becomes more concentrated among the poor over time. For instance, in the 1970s high-income households (both white and black) were slightly more likely to be burglarized than low-income households, but by the 1990s low-income households were 60 percent more likely to be victims of burglary. High-income black households went from being four times as likely to have a vehicle stolen to about twice as likely between the 1970s and the 1990s. There are two plausible explanations for this pattern: (1) increased spatial segregation by income, especially for high-income blacks (Wilson 1987) and (2) increased investment in home security and automotive antitheft devices, which is concentrated among rich households. There has been substantial technological advance in victim precaution devices, fueling a dramatic expansion in the size of this industry. The home security industry has grown at an annual rate of 10 percent over the last decade and is now a $14 billion a year business. In a recent survey, 19 percent of households report having a burglar alarm. Houses valued at over $300,000 have a home security system installed 39 percent of the time, compared with only 9 percent for houses valued at less than $100,000.

The temporal patterns of robbery and aggravated assault suggest that the second of these two explanations may be the more important. In contrast to property crime, the rich are not successful in systematically reducing their relative aggravated assault or robbery victimization (nor murder, in the analysis presented below using Chicago data). If spatial isolation were the key factor in reducing property victimization, one would expect to observe a similar pattern for violent crime. However, the differential pattern in violent and property offenses can be explained by the fact that there is no parallel expenditure on victim precaution that the rich can make to reduce the likelihood of violent crime in the way that burglary and auto theft can be prevented.[8] This argument is, of course, highly conjectural and in need of further testing.

IV. Neighborhood-Level Homicide Victimization in Chicago

The preceding section examined nationally representative survey data. For reasons of confidentiality, no local socioeconomic characteristics are included in NCVS. Consequently, while victimization can be stratified by income and race, no other coverages are available. In this section, neighborhood-level data for the city of Chicago are used to examine the correlates of crime at the local level.

The city of Chicago is divided into seventy-seven neighborhoods (sometimes referred to as communities). Neighborhood borders, which have remained unchanged, were initially chosen so as to capture distinct community characteristics roughly fifty years ago, although the distinctiveness of the neighborhoods has blurred somewhat over time. Nonetheless, neighborhood identities (such as those of Hyde Park, Lincoln Park, Austin, Woodlawn, and Grand Boulevard) remain strong. Neighborhood populations range from roughly 5,000 to over 100,000 and cover between one and twenty-five census tracts. In the analysis that follows, I use all of the neighborhoods except the central business district (the Loop), which has very few residents but a large commuter population.[9]

Block et al. (1998) have assembled a unique data set on Chicago homicides with information paralleling the Federal Bureau of Investigation's Supplementary Homicide Report, but also adding detailed geographic identifiers. In this paper, I use data from 1965-95, aggregated up to the neighborhood level. Because the number of homicides per neighborhood each year is relatively small, I also aggregate homicide data over ten-year periods centered around decennial census years (that is, 1966-75, 1976-85, 1986-95). The homicide data are merged with neighborhood information from the 1970, 1980, and 1990 Censuses of Population and Housing. Summary statistics across neighborhoods are reported in Table 3 for each of the census years. Within time periods, there are enormous differences in homicide rates across neighborhoods. For instance, a substantial fraction of neighborhoods did not experience a single homicide between 1966 and 1975 (reported in the 1970 entry in the table), whereas other neighborhoods had homicide rates of more than 70 per 100,000 annually, roughly ten times the national average.

Mean homicide rates rose from 22.3 per 100,000 in the early part of the sample to 29.2 per 100,000 by the end. For the 1986-95 period, no neighborhood was completely free of homicides, and the worst neighborhood had more than 100 homicides per 100,000 residents annually.

Median family income, on average, was relatively stable across the three censuses at approximately $30,000 in 1990 dollars. Note, however, that the standard deviation in this variable across communities rose substantially, from $7,650 in 1970 to $12,964 in 1990, signifying increased spatial sorting by income over time at the neighborhood level.[10] This pattern was even more apparent in the minimum and maximum median family incomes by community. In 1970, the range was $16,435 to $56,821. In 1990, the span was $5,909 to $75,113. The poorest neighborhoods became much poorer, whereas the richest neighborhoods were substantially wealthier.

Table 3
COMMUNITY-LEVEL SUMMARY STATISTICS

Variable and Time Period	Mean	Standard Deviation	Minimum	Maximum
1970				
Annual homicide rate per 100,000	22.3	21.5	0	71.2
Median family income (1990 dollars)	33,930	7,650	16,435	56,821
Percentage black	32.6	38.8	0	99.3
Percentage Hispanic	7.3	10.7	0	54.9
Percentage owner-occupied	35.2	24.1	0.6	90.1
Percentage female-headed households	18.5	9.2	7.8	48.3
Percentage foreign born	11.1	7.7	0.1	25.6
1980				
Annual homicide rate per 100,000	25.9	20.3	0	81.5
Median family income (1990 dollars)	29,168	8,812	8,811	50,554
Percentage black	39.9	41.7	0	99.4
Percentage Hispanic	14.1	19.5	0.5	77.6
Percentage owner-occupied	38.3	22.2	0.5	90.6
Percentage female-headed households	33.2	17.8	7.9	78.5
Percentage foreign born	14.4	12.1	0.1	44.7
1990				
Annual homicide rate per 100,000	29.2	25.4	0.9	106.6
Median family income (1990 dollars)	31,131	12,964	5,909	75,113
Percentage black	38.4	40.6	0	99.5
Percentage Hispanic	19.1	23.1	0.1	87.8
Percentage owner-occupied	42.0	21.8	2.0	91.0
Percentage female-headed households	34.4	20.4	7.2	84.5
Percentage foreign born	16.8	14.2	0.2	49.1

Sources: All data except homicide rates are drawn from neighborhood-level census data for seventy-six Chicago neighborhoods (only the central business district is excluded). Homicide data are an average of annual homicide rates per 100,000 in the ten-year period centered around the census year (for example, 1976-85), based on data compiled in Block et al. (1998).

Note: Reported values are weighted by neighborhood population.

A few other facts are worth noting in the summary statistics. First, blacks represent 30-40 percent of the Chicago population overall, but there is a great deal of racial segregation. In 1990, almost half of the city's population (48 percent) lived in communities in which one race made up at least 85 percent of residents; in 1970, that figure was 57 percent. Second, the fraction of the population denoted Hispanic increased dramatically over time, from 7.3 percent to 19.1 percent. Because of changing census definitions of Hispanic, however, it is difficult to determine how much of this increase is real and what fraction is an artifact of data recording. Thus, for most of the paper, I will concentrate solely on the categories non-Hispanic white (simply denoted white) and black. A final point of interest is the fact that the proportion of female-headed households roughly doubled over the sample period. By 1990, more than one in three households with children had an absent father.

Table 4 presents the distribution of annual homicide rates across Chicago neighborhoods for three time periods. Because of the stark differences in homicide rates for whites and blacks, the results are presented separately by race.[11] The homicide rates are population-weighted, so that the numbers reported in the table correspond to the individual-level distribution of homicide risk if all white residents of a community have an equal chance of being victimized and similarly for blacks. Put another way, neighborhoods with few whites (blacks) get little weight in the columns for whites (blacks).

The most striking feature of Table 4 are the enormous differences between whites and blacks. Twenty-five percent of whites in all time periods lived in neighborhoods where not a single white homicide victimization occurred over the course of a decade. Even the most dangerous neighborhoods for whites experienced homicide rates of only about 10 per 100,000, about one-fourth the median homicide rate

Table 4
DISTRIBUTION OF HOMICIDE RATES PER 100,000 RESIDENTS ACROSS RACE AND TIME

Homicide Percentile	White			Black		
	1966-75	1976-85	1986-95	1966-75	1976-85	1986-95
0-10	0.0	0.0	0.0	1.0	1.4	0.8
10-25	0.0	0.0	0.0	6.1	9.4	9.6
25-50	0.9	1.5	1.2	21.5	23.8	31.2
50-75	3.1	3.6	2.9	53.5	41.4	46.3
75-90	5.8	5.6	4.5	65.9	57.8	71.2
90+	11.9	9.2	7.6	85.8	93.7	109.9
Median	1.8	2.4	2.0	32.5	29.4	42.5
Mean	3.1	3.2	2.5	39.7	37.0	43.8

Sources: See Table 3.

Notes: Values in the table are annual homicide rates per 100,000 residents. Homicide percentiles are obtained by rank ordering homicide rates by race across communities and taking a weighted average, with weights based on the white (or in columns 4-6, black) population in a community.

among blacks. Black residents in the highest risk neighborhoods were murdered at rates about ten times greater than whites in the most dangerous white neighborhoods.

A second fact worth noting is that there are substantial differences across neighborhoods within race. Homicide rates for whites in the most dangerous neighborhoods were more than six times greater than the median white in 1970 and three to four times higher in 1980 and 1990. The black residents most at risk faced homicide rates two to three times greater than the median black and almost one hundred times greater than the safest black residents. Homicide rates rose about 25 percent in Chicago over the time period examined, but a substantial part of this increase was due to an increase in the black population, rather than changes in per-capita victimization rates within race.

Table 5 documents the large differences in income across Chicago neighborhoods and how the income distribution widened, particularly between 1980 and 1990. The numbers reported are neighborhood median family incomes by race. For instance, the entries in the top row of the table for whites represent the average median family income for the neighborhoods in which the poorest decile of whites reside.[12] In 1970, the poorest 10 percent of whites lived in neighborhoods with an average median family income of $26,834 (in 1990 dollars). The corresponding number for the richest 10 percent of whites in

Table 5
DISTRIBUTION OF NEIGHBORHOOD MEDIAN FAMILY INCOME BY RACE

Median Family Income Percentile	White			Black		
	1969	1979	1989	1969	1979	1989
0-10	26,834	21,127	18,638	18,475	10,592	8,232
10-25	32,284	27,821	26,137	20,938	14,109	13,332
25-50	35,542	32,141	32,794	23,589	20,002	21,363
50-75	38,519	36,579	39,863	30,490	27,131	27,156
75-90	41,512	39,770	46,163	36,559	32,919	31,789
90+	47,790	44,675	66,341	40,465	38,567	44,540

Sources: See Table 3.

Notes: Values in the table are neighborhood median family incomes in U.S. dollars. Percentiles are obtained by rank ordering median family income across communities and taking a weighted average, with weights based on the white (or in columns 4-6, black) population in a community. Note that median family income is available only at the community level, not broken down by race within a community. To the extent that white and black residents of the same neighborhoods have different incomes, the values in the table will not reflect actual median family incomes of white or black residents of the community, but only of all community residents.

1970 was $47,790. By 1990, income for the poorest white neighborhoods had fallen about 30 percent, whereas for the richest whites there was a 40 percent increase. Among blacks, incomes fell more than 50 percent in the poorest neighborhoods between 1970 and 1990, and increased 10 percent in the richest neighborhoods.

Table 6 presents homicide rates across neighborhoods ranked by median family income. Each figure in Table 6 corresponds to the same figure in Table 5, except

Table 6
DISTRIBUTION OF HOMICIDE RATES BY MEDIAN FAMILY INCOME BY COMMUNITY AND RACE

Median Family Income Percentile	White			Black		
	1966-75	1976-85	1986-95	1966-75	1976-85	1986-95
0-10	8.4	5.5	0.4	86.1	91.5	117.0
10-25	4.2	3.6	3.5	48.1	62.5	63.9
25-50	3.6	4.0	2.9	65.2	42.5	39.8
50-75	2.1	2.6	2.1	24.7	21.5	32.6
75-90	1.5	2.1	2.0	8.8	19.8	37.0
90+	0.8	1.9	2.9	4.7	11.2	10.0

Sources: See Table 3.

Notes: This table parallels Table 5, except that homicide rates per 100,000 are reported in place of median family income. Thus, the percentiles in this table are based on median family income in a community, *not* homicide rates (in contrast to Table 4).

that the homicide rate for these same neighborhoods is reported in place of the median family income. There is a strong correspondence between median family income and homicide rates in the early part of the sample. The poorest white neighborhoods experienced murder rates ten times greater than the richest white neighborhoods; for blacks, the corresponding ratio was almost twenty to one. It is striking, however, that the link between income and homicide weakened substantially over time. For whites, homicide rates were unrelated to income in the 1986-95 period. In fact, the very lowest homicide rates were reported in the poorest white neighborhoods. For blacks, the pattern was less pronounced. The worst black neighborhoods experienced higher homicide rates in later years, but the rise in homicides in these neighborhoods was much smaller than the proportionate increase in the richer black neighborhoods. Murder rates in the 75th to 90th income percentile more than quadrupled for blacks; rates for the highest 10 percent of blacks more than doubled.

What makes the narrowing of the murder gap between the rich and poor so remarkable is that it occurred at a time when the neighborhood incomes were diverging. In other words, not only is it true that rich white neighborhoods have gone from having one-tenth the number of homicides as poor white neighborhoods to having similar rates, but that the richest neighborhoods have gotten substantially richer relative to the poor neighborhoods.

Tables 7 and 8 further investigate the link between neighborhood income and crime in a regression framework. Table 7 aggregates all community residents, regardless of race. Two specifications are shown for each decade, along with a panel-data regression including community-fixed effects. When only median family income and race dummies are included (columns 1, 3, and 5), the impact of income is greater than when a fuller set of covariates are allowed. Without covariates, an extra $1,000 of family income reduces the homicide rate by 1.5 per 100,000 in 1970. A one-standard-deviation change in

Table 7
CORRELATES OF COMMUNITY HOMICIDE RATES

Variable	1970		1980		1990		1970-90	
Median family income (x1000)	-1.5 (0.3)	-0.7 (0.4)	-1.7 (0.2)	-0.8 (0.2)	-0.7 (0.2)	-0.5 (0.2)	-0.7 (0.1)	-0.4 (0.2)
Percentage black	0.28 (0.05)	0.16 (0.06)	0.14 (0.03)	-0.01 (0.04)	0.41 (0.06)	0.07 (0.07)	0.24 (0.06)	0.14 (0.07)
Percentage Hispanic	-0.01 (0.10)	0.17 (0.10)	0.02 (0.05)	0.15 (0.05)	0.08 (0.09)	0.18 (0.09)	0.02 (0.08)	0.23 (0.10)
Percentage owner-occupied	—	-0.07 (0.07)	—	0.16 (0.09)	—	0.01 (0.10)	—	-0.35 (0.24)
Percentage female-headed households	—	0.82 (0.52)	—	0.94 (0.18)	—	0.76 (0.18)	—	0.35 (0.09)
Percentage foreign born	—	-0.40 (0.21)	—	0.13 (0.14)	—	-0.30 (0.17)	—	-0.31 (0.20)
Constant	63.8 (11.3)	30.8 (22.5)	68.8 (7.9)	9.3 (10.7)	34.8 (12.3)	17.3 (13.6)	—	—
Year=1980	—	—	—	—	—	—	-0.6 (1.3)	-3.3 (1.4)
Year=1990	—	—	—	—	—	—	5.1 (1.7)	2.0 (1.7)
R^2	.89	.91	.84	.91	.78	.87	.94	.95
Number of observations	76	76	76	76	76	76	228	228
Community dummies included?	No	No	No	No	No	No	Yes	Yes

Sources: See Table 3.

Notes: The dependent variable is the homicide rate per 100,000. The first six columns are cross-sectional, neighborhood-level regressions using the standard Chicago neighborhood classification, excluding the central business district. The final two columns are fixed-effect panel-data regressions using the three sets of years included in the first six columns. All regressions are estimated using weighted least squares with weights proportional to neighborhood population.

median family income ($7,650), evaluated at the sample mean, raises the homicide rate by about 50 percent. When other covariates are included, the impact of family income is roughly halved and loses statistical significance. A 5 percent increase in the percentage of residents that are black (holding income constant) has approximately the same impact on homicide rates as a $1,000 increase in family income. The coefficient on female-headed households is economically quite large (a one-standard-deviation change increases homicide rates by one-third), but is not statistically significant. An increase in owner-occupied housing and in foreign-born residents, holding all else constant, is associated with lower crime rates. These latter estimates, however, are also not statistically significant at the .05 level. Results for 1980 are for the most part similar to those from 1970, but are more precisely estimated. The coefficient on median family income shrinks in 1990, but remains statistically significant. Because the cross-community dispersion in incomes is greater in 1990, a one-standard-deviation decline in family income still leads to roughly a 30 percent increase in homicide victimization. The concentration of female-headed households also changes dramatically between 1970 and 1990 (the standard deviation on this variable more than doubles), so that even though the coefficients are similar across years, the importance of this variable in explaining differences in crime increases over time.

The last two columns of Table 7 present panel-data estimates. The estimates on family income are smaller than in any of the cross-sections, but nonetheless statistically significant. The coefficient on female-headed households also falls but is still highly significant. Owner-occupied housing reduces crime, but it is not statistically significant at the .05 level.

Table 8 presents results separately for whites and blacks. Only the coefficients on the median family income variable are presented; complete regression results are available from the author. Each entry in the table represents the coefficient from a different regression. It is important to note that the census data on communities are not broken down by race, so the race-specific regressions assume that blacks and whites in a given neighborhood have the same characteristics. As would be expected given the results in Table 6, there are enormous differences across races, with the coefficient on median family income an order of magnitude that is greater for blacks. Among whites, the link between income and homicide victimization goes from negative and statistically significant to zero between 1970 and 1990. The relationship between income and homicide also falls sharply for blacks over time, but remains statistically significant in all instances except in the panel regression with a full set of controls.

Table 8
MEDIAN FAMILY INCOME AND HOMICIDE RATES BY RACE
Coefficient on median family income from various specifications

Regression Specification	White	Black
Simple regression, no covariates		
1970	-0.29	-3.4
	(0.14)	(0.4)
1980	-0.12	-2.5
	(0.06)	(0.4)
1990	0.00	-2.0
	(0.03)	(0.3)
Panel 1970-90	0.03	-1.1
	(0.06)	(0.4)
Full set of controls included		
1970	-0.22	-3.5
	(0.17)	(0.8)
1980	0.07	-1.8
	(0.08)	(0.4)
1990	0.03	-1.3
	(0.03)	(0.3)
Panel 1970-90	0.04	-0.5
	(0.08)	(0.5)

Sources: See Table 3.

Notes: Values in the table are the coefficients on the median family income variable from regressions paralleling those in Table 7, except that the dependent variable is the homicide rate per 100,000 within a racial group in a community. Each entry in the table reflects a different regression.

V. CONCLUDING REMARKS

This paper presents a set of empirical results on the relationship between income and crime victimization and how that pattern has changed over time. National victimization data suggest that property crime victimizations have become increasingly concentrated among the poor over the last twenty years. The poor are more likely to be victims of robbery and aggravated assault, and this relationship has remained true over time. Income inequality across Chicago neighborhoods has increased sharply over the last twenty years. Interestingly, however, the link

between neighborhood income and homicide rates has substantially weakened over the same time period. In fact, for whites, there is no relationship between median family income in the neighborhood and homicide rates in the 1990s.

The contrasts in the pattern for property crime and homicide raise intriguing questions about the relationship between income and crime. One explanation for decreased property crime victimization of the rich is the increased reliance on victim precaution expenditures by the rich to protect their homes and cars—protection that is less likely to reduce violent crime and homicide. The results with respect to Chicago homicide—namely, that the rich have been less able to insulate themselves from homicide in recent years—clearly warrant further explanation. Examining the circumstances of homicide and the relationship between victim and offender is a logical first step toward understanding this result better. If the finding proves robust, it reflects an important and previously unrecognized trend in crime victimization. Among other things, this result may provide an explanation for the puzzle whereby fear of crime has risen steadily among the typical American, even at times when crime is steady or declining.

ENDNOTES

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1. Various theories also have predictions about how changes in income inequality might affect the level of crime, but I do not focus on this question in the paper. Strain theory, for instance, argues that an increased gap between rich and poor promulgates frustration on the part of the poor, leading them to react violently against the inequity in society, although their rage may be directed either toward the rich or the poor (Cloward and Ohlin 1960). It is also possible that higher crime can lead to greater income inequality. For example, as inner-city crime rises, a firm producing in this area must offer higher wages to attract workers. These rising production costs lead the firm to relocate into lower crime neighborhoods. The spatial mismatch between the location of poor inner-city residents and jobs may further worsen the residents' economic plight (for example, see Wilson [1996]).

2. Capitalization of the costs of crime into property values further complicates welfare calculations. If the costs of crime are fully capitalized, then exogenous increases in crime hurt property owners, but after one takes into account lower rents, they would not reduce the utility of the marginal renter.

3. Furthermore, there is evidence that the propensity to report crime to the police is a function of a victim's income. For instance, in the 1992 NCVS, households with income below $10,000 say that they reported roughly 50 percent of all completed burglaries to the police, whereas households with income over $30,000 report more than 60 percent.

4. Nonlinearity in the mapping from income to victimization further complicates the issue.

5. Unfortunately, the NCVS stopped reporting neighborhood-level characteristics in the late 1970s due to concerns about anonymity. So the approach Sampson (1985) used is not available for more recent data.

6. Homicide is not included in the NCVS. The incidence of rape is too low to generate results when stratified by income and race.

7. According to the consumer price index, prices somewhat more than tripled between 1974 and 1994. The cutoffs in nominal terms in 1974 and 1975 for the low-income and high-income classification are $7,000 and $15,000.

8. One possible exception to the inability to protect oneself from violent crime is residence in a gated community. I thank Derek Neal for this observation.

9. This creates a problem because homicides are classified by place of occurrence rather than by place of residence of the victim.

10. The years 1970 and 1990 refer to when the census was conducted. The income data actually correspond to the previous year in each case.

11. Attempts to calculate results for Hispanics yield homicide rates between those of non-Hispanic whites and blacks. As noted above, generating reliable results for Hispanics is complicated by changing definitions of Hispanic across censuses as well as by the fact that the Chicago Police Department's definition of Hispanic need not correspond to that used in the census.

12. Note that the numbers reported do not necessarily correspond to income numbers for whites only in these neighborhoods, but rather to all neighborhood residents. To the extent that income systematically differs by race within a neighborhood, these numbers will not be completely accurate. Given the available data, however, the breakdown provided is the best that can be offered.

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