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ABSTRACT

In the 1960s numerous cities in the United States experienced violent, race-related civil disturbances. Although social scientists have long studied the causes of the riots, the consequences have received much less attention. This paper examines census data from 1950 to 1980 to measure the riots' impact on the value of central-city residential property, and especially on black-owned property. Both ordinary least squares and two-stage least squares estimates indicate that the riots depressed the median value of black-owned property between 1960 and 1970, with little or no rebound in the 1970s. Analysis of household-level data suggests that the racial gap in the value of property widened in riot-afflicted cities during the 1970s.

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I. Introduction

The course of racial politics in the United States changed abruptly between the passage of the Civil Rights Act of 1964 and the Fair Housing Act of 1968. In August 1965, the torching and looting of Watts, a predominantly black area of Los Angeles, ushered in an unusually violent period in American urban history.[1] In subsequent years, scores of riots broke out in urban black neighborhoods. As a group, and particularly following the death of Martin Luther King in April of 1968, the riots signaled the end of the carefully orchestrated, non-violent component of the Civil Rights Movement.

Social scientists have long tried to identify city-level factors associated with the incidence and severity of riots. This line of investigation started with Lieberson and Silverman (1965), Wanderer (1969), and Spilerman (1970, 1971, 1976), and it has continued in more recent work by Olzak et al. (1996), DiPasquale and Glaeser (1997), and Myers (1997, 2000).[2] In contrast to the literature on the riots' causes, there are comparatively few papers that study the riots' effects (Frey 1970, Kelly and Snyder 1980, Collins and Margo 2004). Consequently, the riots' economic significance, if any, remains largely undocumented. After briefly characterizing the riots in section II, this paper marshals an array of evidence to measure the riots' effect on residential property values between 1960 and 1980. Our fundamental question is straightforward: Did the riots have sizable, long-lasting effects on the cities and neighborhoods in which they occurred?

Our investigation is closely connected to a much larger body of work on the history and economic implications of urban residential segregation, and especially the concentration of poverty in predominantly black central-city neighborhoods.[3] Different authors have emphasized different aspects of the story, but the overarching theme features the interplay of four factors. First, discriminatory norms and public policies, along with large racial gaps in income and wealth, led to high levels of racial residential segregation. Second,

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[1] During the Watts riot, 34 people were killed, more than 1,000 people were injured, and more than 3,000 instances of arson were recorded. The riot erupted after police arrested a young black man for allegedly driving while intoxicated. Elsewhere, there had been much smaller riots prior to the explosion in Watts, including Philadelphia and New York City in 1964.

[2] Other notable contributions include Downes (1968), Lieske (1978), and Carter (1986).

[3] See, inter alia, Weaver 1948, Kain 1968, Wilson 1987, Galster 1991, Massey and Denton 1993, Sugrue 1996, Cutler and Glaeser 1997, Collins and Margo 2000, and Yinger 2001.

postwar macroeconomic and technological trends lowered the relative demand for unskilled labor which disproportionately affected black workers. Third, as a larger black middle and professional class emerged, relatively high-income blacks began leaving central-city neighborhoods for the suburbs. Fourth, and potentially endogenous to the first three factors, central-city neighborhoods experienced rising rates of crime and unemployment.

Our analysis should be seen generally in the context of this literature, and specifically, as an investigation of the potential spillover effects from adverse shocks emphasized by Massey and Denton (1993). The hypothesis under consideration is that riots in the 1960s imparted negative impulses that contributed to the economic decline of some central cities in the short run (the 1960s) and that persisted through the 1970s.[4] It is entirely plausible, however, that the riots' effects were small and short-lived; indeed, under certain conditions, the effects might even have been positive.

We concentrate on the riots' potential impact on property values for two reasons. First, it is well-established in the urban economics literature that housing values reflect a broad range of neighborhood characteristics. Therefore, if the riots contributed to a relative decline in neighborhood quality, we should be able to detect a relative decline in property values. Second, Collins and Margo (2003) found that the racial gap in housing values widened in central cities in the 1970s and suggested that the widening might be associated with the occurrence of riots. That suggestion, however, stopped far short of a causal interpretation. This paper provides a much more direct test of the hypothesis that the riots were causally linked to changes in property values.

Using both city-level and household-level data, we find negative, persistent, and economically significant correlations between riot severity and black-owned property values. Because our research design relies on differences across cities in housing value trends, these estimates might understate the riots' true impact. For example, riots in some cities might have influenced perceptions about the economic prospects

[4] That is, severe riots may have been shocks that were propagated into "bad ghettos", in the sense of Cutler and Glaeser (1997). In 1990 data, Cutler and Glaeser find a strong adverse correlation between segregation levels and young blacks' socioeconomic status. Collins and Margo (2000) find that this correlation is much weaker before the 1970s.

of all cities (or about black areas of all cities). Such inter-city spillovers would tend to diminish the magnitude of the riot coefficients in our basic econometric framework. Alternatively, it is possible, though contrary to much of the sociology literature, that omitted variables drove both the variation in riot severity and the variation in observed housing market trends, leading to misstatements of the riots' true impact. We attempt to defuse this problem by controlling for a series of relevant city characteristics, including pre-existing trends in housing values and pre-riot measures of city size, black population size, manufacturing employment, residential segregation, crime, and region. We also pursue an instrumental variable approach to estimating the riots' effects, relying on variation in weather around the time of Martin Luther King's assassination and differences in city government structures to isolate exogenous variation in riot severity. From each perspective, the riots appear to have had a strong negative impact on property values.

II. The Riots and Their Measure

The United States has a long history of violent, race-related civil disturbances (Gilje 1996). In most cases of collective violence prior to the 1940s, the riots were instigated by white civilians and directed against black civilians and property, as in the infamous 1863 draft riot in New York City and the 1921 Tulsa riot. In 1943, there was an outbreak of riots that in character (if not in number) bear a closer resemblance to those that occurred in the 1960s. As in the 1960s, some of the 1943 events included violent clashes between blacks and police, the looting of retail establishments, and several instances of arson, often centered in predominantly black neighborhoods. Since the 1960s, the U.S. has not been immune to large-scale, destructive riots, as outbreaks in Miami (1980) and Los Angeles (1992) vividly demonstrated. Nonetheless, the 1960s riots were historically unusual. They were widespread geographically and tightly clustered in time, with hundreds of riots and several severe riots (by historical standards) occurring within just a few years.

Sociologists have carefully documented the location, timing, and severity of race-related civil disturbances in the 1960s and early 1970s. The main sources of information about the riots are the Congressional Quarterly's *Civil Disorder Chronology* (1967), the Kerner Commission Report (1968), an

index prepared by the *New York Times*, and the "Riot Data Review" compiled by the Lemberg Center for the Study of Violence at Brandeis University. Each primary source used somewhat different definitions of a riot, collected different dimensions of data, and covered different time frames. But with a reasonable margin of error, the combination of information provides a detailed picture of riot activity during the 1960s.

The standard operational definition of a race-related riot, established explicitly in Spilerman's early work (1970, 1971), required a spontaneous event with at least 30 participants, some of whom were black, that resulted in property damage, looting, or other "aggressive behavior". Disturbances that were directly associated with organized protests, or that occurred in school settings were excluded. Carter (1986) extended Spilerman's original data to 1971. He also verified the original data by checking alternative sources (when available), and in general, refined the database for subsequent studies. Carter's dataset covers 1964 to 1971 and includes the dates and locations of more than 700 civil disturbances, as well as the associated number of arrests, injuries, occurrences of arson, and deaths. We rely on Carter's data to measure variation in riot severity across cities.

We combine five characteristics of each riot in an index of severity. Specifically, we assign each riot (indexed by j) a value $S_j = \sum_i (X_{ij} / X_{iT})$ where X_{ij} is a component of severity (deaths, injuries, arrests, arsons, and days of rioting) and X_{iT} is the sum of component X_{ij} across all riots. S_j is the proportion of all riot deaths that occurred during riot j, plus the proportion of all riot injuries that occurred during riot j, plus the proportion of all arrests, and so on. Summed over all riots, there are five total index points, reflecting the five components that enter the index. We add the index values for each riot within a city to form a cumulative city-level riot severity measure.[5]

The index has potential shortcomings. Counts of destructive events do not necessarily correspond closely to economic damage, nor to people's perceptions of the event's severity and implications. Thus, it is possible that potentially important components are missing from the index, or that given the existing

[5] Our measure of riot severity is "absolute" in the sense that we do not scale severity by population. However, our city-level regressions control for population directly and the household-level regressions include area fixed effects and allow for differential trends by city size (see below).

components, some should weigh more heavily than others to capture the "true" severity of the event.[6] Nonetheless, we believe that the index is a useful measure. The individual components of the index are strongly positively correlated, and so in practice it matters little if we re-weight the various components.[7]

Table 1 summarizes the riot data by component, year, and census region. Clearly, riot activity was highly concentrated in 1967 and 1968, which together account for 3.3 out of the 5.0 total index points. When the index numbers are arrayed by census region, there appears to be a comparatively even geographic spread of riot activity.[8] While major riots did occur in every region, the impression is misleading because the "severity" was heavily concentrated in a relatively small number of events and cities, not spread evenly over them. For example, no deaths occurred in 91 percent of the 752 riots underlying table 1, and 90 percent of the riots have severity index values of less than 0.01. By far, the deadliest riots were in Detroit in July 1967 (43 deaths), Los Angeles in August 1965 (34 deaths), and Newark in July 1967 (24 deaths). Using the index as a broader severity measure, the riot in Washington DC following Martin Luther King's assassination (S = 0.34) joins Los Angeles in 1965 (0.48), Detroit in 1967 (0.44), and Newark in 1967 (0.23) as the most severe events on record.

III. Riots' Potential Influence on Property Values

The economic aftermath of a riot is theoretically ambiguous. Through the political process, a riot could elicit a large flow of outside resources to affected areas (or to people living in those areas), thereby improving the economic quality of life and perhaps even attracting new residents and businesses.[9]

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[6] Consistent value-based measures of property damage do not exist for most riots.

[7] The correlations among deaths, arsons, arrests, and injuries across riots are high: at least 0.64 (deaths and injuries) and as high as 0.87 (deaths and arsons). Correlations of these variables with days of riots are somewhat lower, ranging from 0.32 to 0.48. All correlations are statistically significant at the one percent level.

[8] Washington DC and Baltimore, which had sizable riots, are counted in the census South.

[9] Along these lines, the Kerner Commission Report concluded with a chapter of "Recommendations for National Action" aimed at improving the economic lot of African Americans in central cities (Kerner 1968). Post-riot surveys in some cities found that a substantial fraction of blacks thought that the riot would have positive effects (Welch 1975). Ex post, the extent to which policy truly responded to the riots is unclear (Hahn 1970, Welch 1975). In a more general framework, Acemoglu and Robinson (2000) describe how the threat of social disorder might lead a governing elite to redistribute economic benefits and political

Alternatively, a riot could be seen as a purely temporary disturbance with few long-run implications, thereby generating no significant alteration in the economic decisions affecting the area. Or, a riot could set in motion a dynamic process of deteriorating economic outcomes, as mobile residents and businesses seek to relocate to more secure environs, as the quality of public goods and amenities erodes, and as properties in riot areas are allowed to depreciate.

A key feature of the "adverse-impact" view is that the occurrence of a riot might shift perceptions regarding the future costs and benefits associated with residing in, doing business in, or even traveling through a particular city (or parts of the city). Property values should reflect the discounted stream of net benefits associated with a particular location, where "net benefits" include a wide range of amenities, disamenitites, revenues, and taxes. Therefore, if a riot imparts a significant negative shock to the expected stream of net benefits associated with central city properties, it would lead to an immediate decline in property values. This effect could work through any number of the channels that feed into the net benefits stream: personal and property risk might seem higher; insurance premiums might rise; taxes for redistribution or more police and fire protection might increase, and municipal bonds may be more difficult to place; retail outlets might close; businesses and employment opportunities might relocate; friends or family might move away; burned out buildings might be an eyesore; and so on.[10] In turn, given rising costs of maintenance coupled with the decline in values, properties may be allowed to deteriorate physically over time, which might further depress neighborhood property values.

The implications for the city's population size and composition are complex. Given a highly durable residential building stock, supply adjusts slowly to negative demand shocks, as documented by Glaeser and Gyourko (2001). In the period shortly after a riot, if prices adjust to clear the housing market, the city's

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power.

[10] For example, Aldrich and Reiss (1970) and Bean (2000) argue that small businesses were especially hard hit by the riots and by subsequent increases in insurance and security costs. Both the Kerner Commission and the California Governor's Commission recommended costly interventions to improve the quality of life of ghetto residents. Welch (1975) documents differential increases in city spending on police and fire protection between 1965 and 1969 in riot cities compared to non-riot cities. The *New York Times* reported on investors' negative views of the bonds of cities that had riots (Allan, August 13, 1967; November 15, 1967). In some cities, buildings burned in the riots remained partly standing but unrepaired for years; in others, vacant lots remained where the buildings once stood.

population level might not decline relative to others. That is, as long as there are housing units available, people will live in them even though they might not be the same people who lived in them prior to the riots. Over a longer period, if properties fall into complete disrepair and are not replaced, the population should decline correspondingly.

IV. Empirical Strategy and Results

Because the existing microdata sample of the 1960 census does not include city codes, it is impossible to use household-level data to explore city-specific changes in economic conditions during the 1960s.[11] Moreover, because the 1950 microdata sample does not include housing characteristics, it is impossible to control for pre-existing trends with the household-level data. Instead, we rely primarily on data from the published volumes of the 1950, 1960, 1970, and 1980 censuses which report an array of relevant city-level information, including median property values for black (or nonwhite) households, and for the total population.[12] Then, to supplement the investigation, we explore the 1970 and 1980 microdata samples of black and white households, including information on the observable quality of the housing stock.

The existing literature on the cross-city distribution of riot severity suggests that after accounting for each city's black population size and region, comparatively little variation in severity is accounted for by standard measures of African Americans' economic status (in either absolute terms, or relative to whites). Thus, Spilerman concludes that "the severity of a disturbance, as well as its location, appears not to have been contingent upon Negro living conditions or their social or economic status in a community" (1976, p. 789). If so, then straightforward OLS techniques may provide reliable estimates of the riots' economic

[11] See www.ipums.umn.edu for details on variables available in the various public use samples (Ruggles and Sobek 2003).

[12] In 1960 the census reports median property values for nonwhite households, rather than black households specifically. In the vast majority of cities in 1960, the nonwhite population is nearly entirely black. The cross-city correlation between the proportion of the population that is black and the proportion that is nonwhite is 0.995. The average difference between proportion nonwhite and proportion black is 0.0065 (or 0.65 percentage points). The paper's results are not sensitive to excluding cities with relatively large differences.

effects.

We are concerned, however, that unmeasured factors might be associated with both property values and riots. Therefore, we add several control variables in the empirics that follow, and we also pursue instrumental variable estimates of the riot effects using the city-level data. The instrumental variable approach should provide consistent estimates of the riot effects in the presence of omitted variables and should also mitigate attenuation bias associated with measurement error in riot severity.

IV.A. City-Level Data and Results

We begin by estimating the following basic specification by OLS over the 1960-1970 or 1960-1980 period, where *i* indexes a particular city, and *DV* is the log change in median residential property value for black home owners or for all home owners (separate values for whites are not reported in the census volumes).

$$\Delta V_i = \alpha + \beta_1 X_i + \beta_2 \text{Region}_i + \beta_3 \text{Riot}_i + e_i$$

In every specification, the vector of X-characteristics includes the city's total population (1960), the black proportion of the city's population (1960), and a series of dummy variables for census regions. In subsequent specifications, we add control variables for the proportion of employment in manufacturing industries (1960), the level of SMSA residential segregation (1960), the crime rate per 100,000 population (1962), and changes in property values over the 1950 to 1960 period (to control for pre-existing trends).[13]

The value of residential property is a combination of both land and house value. In the years we study, the variable is a self-reported estimate of current value. While there may be errors in such estimates, it is likely that the errors average out over large numbers of home owners, and to the extent that there is bias, we have no reason to think that the bias changed over time.[14] The median black central-city home

[13] The segregation data are from Cutler, Glaeser, and Vigdor (1999). The crime rate figure for 1962 is calculated from the Federal Bureau of Investigation's annual publication of Uniform Crime Statistics.

[14] Kain and Quigley (1972) argue that the self-appraisals are reliable. Ihlanfeldt and Martinez-Vazquez (1986) claim that whites tend to overestimate value relative to blacks (in Atlanta), but the bias is small. We have no knowledge of whether the degree of mismeasurement changed over time.

owner might not be located at the epicenter of the riots, and therefore β_3 might not capture changes in value in the area of the city most directly affected by riot activity.

The *Riot* variable is based on the index values described above and entered as a series of dummy variables: one for "medium severity", one for "high severity".[15] The distribution of the riot index across cities is highly skewed, with a large number of relatively minor riots and a small number of quite severe ones. Therefore, the low-severity category includes all cities below the 50th percentile in the index; the medium-severity category includes the 50th to the 88th percentile; and the high-severity category includes cities above the 88th percentile.[16] Although the high-severity category is relatively small, the cities in it account for about 70 percent of all riot activity in the sample (as measured by the severity index).

Table 2 presents summary statistics by severity group for the cities that enter subsequent regressions (some smaller cities do not report race-specific property values and therefore are omitted). The average log increase in black-owned property values from 1960 to 1970 was approximately 0.07 higher in low-severity cities than in medium severity cities, and 0.11 higher in low-severity cities than in high-severity cities. The differences in log changes are larger over the 1960 to 1980 period; black property values in low-severity cities increased by 0.16 more than in medium-severity cities and by 0.31 more than in high-severity cities. Of course, by themselves these raw differences cannot be interpreted as reliable estimates of the riots' effect because the city-groups differed along a number of other dimensions as well, including region and size. Rather, we estimate the riots' effect conditional on a variety of observable city characteristics.

The identifying assumption in the OLS regressions is that conditional on the X variables and the regional indicators, variation in riot severity is uncorrelated with the error term. That is, controlling for X and region, we begin by assuming that there are not contemporaneous shocks to property values that are

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[15] We have also estimated regressions with the index and index-squared which are omitted to save space. Results indicate a significant negative riot effect. The squared term's coefficient is positive implying some upward curvature starting at index values well beyond the average index value of the high severity group. Few cities have index values in that range. A specification similar to that in column 1 of table 3A, but with index and index-squared rather than severity group dummies, implies approximately a -0.04 effect at the average index value for the medium-severity group and -0.21 at the average index value for the high severity group.

[16] Cities around the 90th percentile had very close index values, so we used a break at the 88th percentile instead.

correlated with the severity of riots. In light of the existing sociology literature, discussed above, and in light of official descriptions of how particular riot events unfolded, such an assumption is defensible. In many (perhaps most) cases of sizable riots, there were identifiable, idiosyncratic "sparks" that, through a series of unforeseen complications, turned a minor altercation into a full-blown riot. In Watts, the arrest of an intoxicated black motorist led to a wider altercation with neighborhood residents. In Detroit, a raid on a "blind pig" (an after-hours drinking establishment) escalated into the decade's deadliest riot. In Newark, rioting commenced after the arrest (and rumored beating) of a taxi driver. In Washington, DC (and many other cities), the assassination of Martin Luther King set off a large-scale riot. The point is not that the 1960s riots had nothing to do with blacks' economic status in the United States, but rather that the variation in riot severity across places was highly idiosyncratic.

Table 3A reports OLS results for the 1960 to 1970 period, and table 3B reports results for the 1960 to 1980 period. During the 1960s, black property values fell by about 7 log points in medium-severity and 14 log points in high-severity riot cities relative to low-severity riot cities (the omitted category). Column 2's specification includes the manufacturing proportion of employment to capture property value trends driven by post-1960 de-industrialization (Sugrue 1996). Column 3 adds the 1950 to 1960 trend in values, and column 4 adds metropolitan area segregation (measured as a dissimilarity index). Ceteris paribus, cities with comparatively strong housing value growth from 1950 to 1960 continued to have relatively strong growth in the 1960s (at least among blacks), and cities with relatively high levels of segregation in 1960 subsequently experienced relative declines in black property values. Column 5 adds the crime rate in 1962, which appear to have had no influence on subsequent property value trends. Importantly, the negative and significant coefficients on the riot variables are not undermined in any of these specifications.[17]

Given our reliance on census data, it is very difficult to rule out unobserved factors operating between 1960 and 1965 that could have influenced housing markets. Although it is a rough gauge of changes in local economic conditions just prior to the riots, we can include controls for changes in state-level

[17] These coefficients could be biased toward zero if the "filtering" process (in which blacks buy formerly white-owned housing of relatively high quality) was accelerated in cities with severe riots. That is, the changing stock of "black-owned housing" could confound observed changes in the median value.

personal income per capita compiled by the Bureau of Economic Analysis (results not shown in table).[18] Doing so has little effect on the riot coefficients the base specifications of tables 3A and 3B.

Columns 6 to 10 of table 3A indicate that median property values for samples of *all* owner-occupied housing fell by about 4 log points in the medium-severity cities and 10 log points in the high-severity cities relative to low-severity cities. Although the point estimates are somewhat smaller than those for black-owned property, these estimated effects are economically large, and especially for the high-severity coefficients, statistically significant.[19] Given the potential for intra-city accommodation of the demand shock to riot-afflicted neighborhoods and our reliance on city-level median values, these coefficients may underestimate the riots' effects on the neighborhoods they actually occurred in. That is, a negative demand shift in riot areas could be accompanied by a positive demand shift in non-riot areas within the same city, tending to mitigate the downward movement of the city-wide median value.

There is no evidence in table 3B that property values in riot-torn cities bounced back relative to others during the 1970s. If anything, the point-estimates for the 1960-80 period are somewhat larger in magnitude than for the 1960-70 period. In the medium-severity cities, on average, black property values fell by 8 to 10 log points relative to the omitted category between 1960 and 1980. The point estimates for the average decline in the high-severity cities range from 14 to 20 log points. Although the high-severity coefficients for the "all properties" regressions (columns 6 to 10) are less precisely estimated than those for black-owned properties, the coefficients for both medium and high-severity variables remain economically large.

We have tested the robustness of the OLS estimates in several ways. Quantile regressions (at the

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[18] Personal income per capita data are from the Bureau of Economic Analysis's website: www.bea.doc.gov. We also used the IPUMS to calculate a labor demand shift index for the 1960s which combines information on national-level shifts in three-digit industrial employment and metropolitan area industrial employment structures (in 1970). This variable's inclusion does not undermine the OLS riot coefficients.

[19] We cannot use the "all races, owner occupied property values" to form a legitimate difference-in-difference-in-difference estimator. But it is worth noting that after entering the change in the value of all owner-occupied housing as a control variable in the base specification of table 3A (with the change in black-owned property value as the dependent variable), the riot coefficients remain economically significant: -0.04 (t-stat= 1.7) for medium severity and -0.08 (t-stat = 2.4) for high severity.

median) with the base specifications yield riot coefficient estimates that are similar to the OLS results. Excluding cities with relatively small black populations (less than 10,000 in 1960) or relatively large black populations (more than 500,000) has little impact on the OLS riot coefficients.[20] Omitting any one of the high severity cities has little impact on the riot coefficients. Finally, splitting the full sample into northern and southern segments dramatically reduces the sample sizes but does not undermine the significant negative relationship between riots and changes in black property values.

The regressions' inclusion of several city-specific variables should mitigate the possibility that unobserved factors correlated with riot severity had an independent influence on property values. Alternatively, we can pursue an instrumental variable approach that isolates plausibly exogenous variation in riot severity to measure the riot effect. In this case, a viable instrument should influence the severity of riots but should not have an independent influence on long-run trends in property values.

Our first instrumental variable is rainfall in the month of April 1968. Martin Luther King was assassinated on April 4, 1968, and subsequently more than 100 riots erupted. Thus, a specific, identifiable event greatly increased the likelihood of rioting during the month.[21] There is considerable anecdotal evidence that people are less likely to engage in collective violence when it rains. Sidney Fine (1989) refers to an event in Detroit in 1966 as "the riot that didn't happen", because rainfall helped defuse an emerging riot. The *New York Times* reported that on August 10, 1968, after two days of riots in Miami, heavy rains kept the streets empty. Dade County's sheriff referred to the rainfall as "beautiful" and joked that all off-duty police had been assigned to pray for more rain (Waldron 1968). In August 1969, the *New York Times* cited a Washington community activist who claimed that rainfall had "nipped one riot in the bud" (Herbers 1969). More recently, after riots in Benton Harbor, Michigan in the summer of 2003, a CNN.com headline read "Rain, curfew help bring quiet night to Benton Harbor."[22] Finally, the U.S. Army's field manual for

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[20] There is a dip in the severe-riot coefficient from 1960-1980 when the three cities with more than 500,000 black residents are omitted. The coefficient is -0.14 (t-stat = 1.9) rather than -0.20 (t-stat = 3.2).

[21] Although many of the riots erupted soon after the announcement of King's death, it appears that the likelihood of riots was higher throughout the month in comparison with previous Aprils. So, we use the entire month. Results are similar if we only use rainfall from the 10 days after King's death. Cross-city variation in temperature is a poor predictor of riot severity.

[22] http://www.cnn.com/2003/US/Midwest/06/18/michigan.unrest/

civil disturbances (FM 19-15) suggests that spraying water may be highly effective as "a high-trajectory weapon, like rainfall" especially in cool weather.[23]

Our second instrumental variable relates to the organizational form of each city's government, and in particular, whether or not the city was administered by a city manager (rather than a mayor). We believe that this feature of city government did not have a direct effect on changes in property values, and that therefore, it is a legitimate instrumental variable. It certainly appears to be a poor predictor of property value trends in the 1950s: a regression of change in property values from 1950 to 1960 on the city manager variable, region dummies, population, black proportion of the population, and manufacturing proportion of employment yields a small and statistically insignificant coefficient on the city manager dummy variable (-0.0039, t-stat = 0.17). At the same time, it is plausible that city managers, who were supposed to apply professional administrative skills to government operations (Sommers 1958), defused the racial tensions underlying riots more effectively than mayors did in this period.[24] We admit that while this interpretation is consistent with the data, it is also speculative.

The OLS results in tables 3A and 3B suggest that the riots' effects were nearly linear in "severity group" – that is, the high severity coefficient is nearly twice the size of the medium severity coefficient (and both are expressed relative to the low severity group). For the 2SLS estimates, we assign the low riot intensity cities a severity value of 0, medium intensity riot cities a severity value of 1, and high intensity riot cities a severity value of 2, and then we instrument for severity-group using the rainfall variable and the city manager dummy. We also check results using the raw severity index as the key independent variable.

The first stage results indicate that rainfall in April 1968 and the presence of a city manager are useful predictors of variation in riot severity. In the base specification, severity-group is regressed on region dummies, city size, black proportion of population (in 1960), rainfall in April 1968, and the city-manager

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[23] http://www.adtdl.army.mil/cgi-bin/atdl.dll/fm/19-15/CH9.htm

[24] Although some political scientists and sociologists argue that mayors may be more responsive to minority needs than managers, the evidence for the 1960s does not suggest that mayors were associated with fewer riots (ceteris paribus). Spilerman (1976) finds a positive correlation between mayors and riot severity. Eisinger (1973) finds a positive correlation between mayors and black protest activity. And we find a negative correlation between city managers and riot severity after controlling for city size, region, and black proportion of population.

dummy. The rainfall coefficient is -0.109 (t-stat = 3.24) and the city-manager coefficient is -0.229 (t-stat = 1.64); the F-statistic for their joint significance is 4.5. Using rainfall in the 10 days after King's assassination (rather than all of April) returns similar first-stage results. Average annual rainfall is a weak predictor of riot severity compared to the April 1968 variable, implying that the rainfall instrument is not merely picking up a coincidental correlation between rainy-ness and riot proneness.[25] Furthermore, a regression that substitutes the actual severity index for the "severity group" measure returns a coefficient on April rainfall of -0.0140 (t-stat = 2.60) and on city manager of -0.0250 (t-stat = 1.75).

The 2SLS results are reported in columns 2, 3, 5, and 6 of table 4 for black housing values, along with comparable OLS specifications in columns 1 and 4. The first column is estimated by OLS and is very similar in specification and results to the first column of table 3A, suggesting that the replacement of the severity dummies (of table 3A) with the severity group variable (of table 4) is a reasonable simplification. In general, the 2SLS coefficients and their standard errors are larger in magnitude than in the OLS analogues. The 2SLS coefficients are uniformly negative, economically large, and remain near conventional levels of statistical significance. Given the relatively large standard errors, it is not surprising that Durbin-Wu-Hausman tests cannot decisively reject the exogeneity of the severity variable, but the test statistics are large enough (p-values of 0.14 for 1960-70 and 0.27 for 1960-80) that we are reluctant to ignore the 2SLS suggestion that the true effects are larger than the OLS estimates.

In regressions similar to those in columns 2 and 5, relying solely on the precipitation variable as an instrument yields somewhat larger coefficients (in magnitude) on the severity-group variable: β_3 = -0.26 (t-stat = 1.84) for 1960-70; β_3 = -0.40 (t-stat = 1.71) for 1960-80. We have also run 2SLS regressions using the raw index of riot severity as the key independent variable (ranging from 0 to 0.5, with mean at 0.04). Again, the results suggest a negative effect on black property values: β_3 = -1.60 (t-stat = 1.93) for 1960-70;

[25] Adding average annual rainfall to the basic first-stage regression yields the following: the coefficient on rain in April 1968 is -0.110 (t-stat = 3.13), the coefficient on average annual rainfall is 0.0016 (t-stat = 0.21). In a reduced form regression of change in black property value (1960-70) on rainfall in April 1968, average annual rainfall, and region indicators, the April 1968 rain coefficient is 0.022 (t-stat = 2.06). For 1960-80, the coefficient is 0.028 (t-stat = 1.70). That is, conditional on region and average annual rainfall, cities with more rain in April 1968 had larger gains in black property values.

β_3 = -2.06 (t-stat = 1.62) for 1960-80. Thus, from every empirical point of view (simple summary statistics, OLS estimates, and 2SLS estimates), the riots are associated with relative declines in central-city property values, especially for black-owned property.

IV.B. Household-Level Data

The main advantage of the household-level data over the city-level data is that one can control for a variety of housing and household characteristics. One can also compare black with white housing values (white-specific figures are not available in the published census volumes). The main drawbacks are that the 1950 household sample has no housing data (and therefore trends are not observed), and the 1960 household sample has no city codes (so it is impossible to match people to city-level riot measures).[26]

In this section we use household-level census data to examine the relationship between riot severity and metropolitan area property values in 1970 and 1980.[27] Because our initial year post-dates the most intense period of rioting, the analysis in this section should be seen as a check on the reliability of our "long run" (1960-80) estimates based on city-level data. In particular, the city-level analysis suggested that black-owned property values in riot-afflicted cities did not rebound in the 1970s. We also use the household-level data to examine changes in the racial gap in property values, an analysis that is not feasible with the city-level data.

With a sample of all black household heads residing in owner-occupied housing (and therefore reporting housing values), we estimate the following difference-in-differences (DD) OLS regression:

$$\ln V = \alpha + \gamma_j + \beta_1 X + \beta_2 \text{ Year} + \beta_3 (\text{Medium Severity}_j \times \text{Year}) + \beta_4 (\text{High Severity}_j \times \text{Year})$$

[26] Very rough estimates can be made with IPUMS data based on state identifications in the 1960 and 1970 samples (assigning "high severity" to states containing high severity cities). With state fixed effects and allowing differential trends by region, the estimated riot effect on black-owned property value is -0.04 (t-stat = 2.06). Adding a variable to allow differential value trends depending on the degree of manufacturing specialization yields a riot effect estimate of -0.07 (t-stat = 3.57). We view these as highly imperfect estimates, but they are certainly consistent with all other evidence in the text.

[27] Unfortunately, it is not possible to limit the sample to central-city residents. Therefore, a large number of suburban residents will be included in this analysis. The sets of medium and high severity metropolitan areas are very similar to the sets for the city-level analysis. We exclude metropolitan areas in 1980 that did not exist in the 1970 data set.

where g_j is a set of metro area fixed effects, *Medium* and *High Severity* are indicator variables, and the *Year* indicator equals one in 1980 (and zero in 1970). Given the inclusion of metro-area fixed effects, coefficients are not identified for any time-invariant city characteristics (such as the level of riot severity), but β_3 and β_4 measure the extent to which black-owned property values trended differently across areas depending on the severity of riots that occurred. β_2 captures city-invariant trends in black property values. The list of X variables includes allowances for differential property value trends across regions, differential trends depending on metro-area population size (in 1970), and differential trends depending on the proportion of employment in manufacturing (in 1970). In several specifications, we also control for a list of housing characteristics, including the number of rooms, number of bathrooms, the age of the building, whether it is air-conditioned, and how it is heated.

Column 1 of table 5 shows that during the 1970s the log value of black-owned housing declined by about 0.16 in high-severity riot areas and 0.04 in medium-severity cities compared to other cities. But allowing for differential regional trends (column 2), halves the high-severity coefficient's point estimate and greatly reduces the size and significance of the medium-severity coefficient. Allowing for differential trends by city size and the proportion of manufacturing employment, both of which are negatively correlated with property value changes in the 1970s, leaves small and statistically weak riot coefficients.[28] This is not too surprising given that the city-level data (tables 3A and 3B) revealed small differences in the coefficient estimates for the 1960-70 period and the 1960-80 period. Black property values in riots-afflicted cities did not bounce back relative to blacks elsewhere in the 1970s, but they did not lose much more ground either.

Adding controls for observable housing characteristics in column 4 reduces the high-severity riot coefficient even before allowing differential trends by region, city size, and manufacturing employment. This suggests that during the 1970s, the physical quality of black-owned housing in high-severity riot cities declined relative to the physical quality of black-owned housing elsewhere.

Table 6 expands the analysis to include white household heads in a difference-in-differences-in-

[28] SMSA size, manufacturing employment, and housing characteristics may be endogenous to the prior occurrence of a riot. If so, the treatment effect is best captured by the regression in column 2.

differences (DDD) framework. Using whites as an additional comparison group could, in principle, difference out unobserved city-specific shocks to housing values that are correlated with riot severity (and therefore likely to bias the measure of riot effects in the difference-in-differences approach pursued above). But we caution readers that whites may not be a truly effective control group to the extent that they too were affected by or responded to the occurrence of riots. We provide the estimates in table 6 primarily to shed light on how the racial gap in property values *within* cities was influenced by riots.

It is clear that during the 1970s, the racial gap in property values widened substantially in cities that had severe riots compared to cities that did not. In the first three columns of table 6, where there are no controls for house characteristics, the estimates of the relative decline are between 0.11 and 0.16 for the high severity cities, but much smaller for the medium severity cities. Adding numerous controls for building characteristics (in columns 4 to 6) reduces the DDD point estimates somewhat, but they remain economically substantial (between 5 and 8 log points) and statistically significant. This finding supports the aforementioned suggestion in Collins and Margo (2003) that racial gaps in property values in central cities were influenced by the riots.

V. Conclusion

In the 1960s numerous cities in the United States experienced violent, race-related civil disturbances. Although social scientists have long studied the causes of the riots, the consequences have received much less attention. This paper uses census data to examine the impact of the riots on the value of residential property, with an emphasis on black-owned property. Precisely measuring the riots' economic effects is difficult because the existing data are imperfect and because the riots may have been endogenous. But we believe that the potential econometric problems are not overwhelming, and all of the evidence we have uncovered points in the same direction.

We find that the occurrence of a riot significantly depressed the value of black-owned property between 1960 and 1970, and that there was little or no rebound during the 1970s. Smaller, but non-trivial, riot-induced declines are also evident for all owner-occupied property. Even when instrumented using

plausibly exogenous variation in weather and city-government structures, the riots appear to have had strong negative effects on black property values. Furthermore, analysis of household-level data from the IPUMS samples suggests that the racial gap in housing values widened in riot-afflicted cities during the 1970s. Along with recent work on the riots' labor market effects (Collins and Margo 2004), this paper's findings suggest that the riots were adverse shocks with long-lasting and potentially self-propagating effects, as described more generally by Massey and Denton (1993).

Although the data analyzed in this paper are sufficient to reveal the existence of riot effects on property values, they are too coarse to reveal the precise location and timing of the declines. Additional geographic detail can be gained by examining the impact of the riots at the census tract-level, and we have made some progress on this front for Washington, Los Angeles, Detroit, and Newark (cities for which maps of riot activity can be matched to maps of census tracts). It appears that riot-torn tracts lost substantial amounts of population relative to non-riot tracts, which is consistent with a decline in the demand for housing in response to a decline in perceived neighborhood quality. More detailed case studies may add considerable depth to the emerging portrait of the riots' adverse effects.

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Table 1: The Riots of the 1960s, Frequency and Severity

	1964	1965	1966	1967	1968	1969	1970	1971	Total
Riots	11	11	53	158	289	124	68	38	752
Days of Riots	34	20	109	408	739	284	126	82	1,802
Killed	2	35	11	83	66	13	13	5	228
Injured	996	1,132	525	2,801	5,302	861	710	414	12,741
Arrested	2,917	4,219	5,107	17,011	31,680	4,730	2,027	1,408	69,099
Occurrences of Arson	238	3,006	812	4,627	6,041	369	283	459	15,835
Index Value	0.163	0.504	0.275	1.349	1.956	0.374	0.230	0.149	5.000
Northeast	0.145	0.003	0.027	0.419	0.288	0.125	0.078	0.023	1.107
Midwest	0.008	0.011	0.180	0.750	0.501	0.079	0.042	0.004	1.574
South	0.010	0.001	0.019	0.107	1.055	0.115	0.104	0.121	1.532
West	0.000	0.489	0.050	0.073	0.112	0.056	0.006	0.001	0.786

Notes: See text for definition of a riot. Each riot (j) is assigned a value $S_j = \sum_i (X_{ij} / X_{iT})$ where X_{ij} is a component of severity (days of rioting, injuries, arrests, deaths, and arsons) and X_{iT} is the sum of X_{ij} across all riots. Summed over all riots in the dataset, there are five total index points (a reflection of the five components that enter the index).

Source: The data underlie Carter (1986) and were received through personal communication.

Table 2: Summary Statistics, City-Level Data, by Severity Group

	Low Severity	Medium Severity	High Severity
Mean Severity Index	0.003 (0.003)	0.021 (0.014)	0.195 (0.155)
Mean Log Change in Median Black Property Value, 1960-70	0.384 (0.144)	0.318 (0.128)	0.270 (0.097)
Mean Log Change in Median Black Property Value, 1960-80	1.327 (0.207)	1.166 (0.280)	1.021 (0.278)
Mean Log Change in Median All Races Property Value, 1960-70	0.303 (0.117)	0.264 (0.112)	0.251 (0.115)
Mean Log Change in Median All Races Property Value, 1960-80	1.303 (0.201)	1.152 (0.273)	1.101 (0.344)
Mean Log Change in Median All Races Property Value, 1950-1960	0.344 (0.108)	0.346 (0.095)	0.314 (0.136)
Black Proportion of Population	0.153 (0.112)	0.196 (0.117)	0.231 (0.128)
Total Population	216772 (137059)	313494 (201211)	1549190 (1966480)
Northeast	0.14	0.17	0.40
Midwest	0.19	0.35	0.27
South	0.51	0.35	0.20
West	0.16	0.13	0.13
N	43	46	15

Notes: Sample for summary statistics is same as that in city-level regressions. The sample excludes cities with missing values for any of the variables. Standard deviations are in parentheses.
Sources: See table 3A.

Table 3A: Riots and Property Values, City-Level Data, 1960-1970

	1: Black	2: Black	3: Black	4: Black	5: Black	6: All	7: All	8: All	9: All	10: All
High Riot Severity	-0.148	-0.150	-0.136	-0.135	-0.114	-0.0978	-0.100	-0.0955	-0.101	-0.0976
	(3.70)	(3.79)	(3.91)	(4.00)	(3.19)	(2.78)	(2.79)	(2.60)	(2.78)	(2.58)
Medium Riot Severity	-0.0669	-0.0698	-0.0669	-0.0659	-0.0630	-0.0405	-0.0438	-0.0428	-0.0459	-0.0396
	(2.59)	(2.78)	(2.72)	(2.70)	(2.79)	(1.79)	(1.88)	(1.86)	(1.90)	(1.65)
Total Population	2.62e-09	3.43 e-09	-4.98 e-10	-3.32 e-10	2.25 e-09	1.99 e-08	2.08 e-08	1.95 e-08	1.90 e-08	1.82 e-08
	(0.36)	(0.44)	(0.07)	(0.05)	(0.37)	(2.91)	(2.92)	(2.66)	(2.69)	(2.71)
Percent Black	0.274	0.258	0.235	0.246	0.107	0.167	0.149	0.141	0.108	0.0874
	(2.05)	(1.86)	(1.75)	(1.69)	(0.73)	(1.43)	(1.25)	(1.16)	(0.80)	(0.63)
Prop. Manu. 1960	-----	0.000915	0.000272	0.000269	0.00148	-----	0.00103	0.000810	0.000820	0.000786
		(0.47)	(0.15)	(0.14)	(0.75)		(0.90)	(0.70)	(0.71)	(0.58)
Value Trend 1950-60	-----	-----	0.319	0.313	0.242	-----	-----	0.109	0.128	0.108
			(3.66)	(3.36)	(2.62)			(1.34)	(1.45)	(1.15)
Crime Rate	-----	-----	-----	-0.223	0.487	-----	-----	-----	0.704	0.808
				(0.23)	(0.52)				(0.80)	(0.88)
Residential Segregation	-----	-----	-----	-----	-0.639	-----	-----	-----	-----	-0.140
					(3.11)					(0.89)
Northeast	0.0612	0.0459	0.0728	0.0754	0.0276	0.0470	0.0298	0.0389	0.0305	0.0297
	(1.25)	(0.69)	(1.11)	(1.07)	(0.38)	(1.30)	(0.69)	(0.89)	(0.72)	(0.61)
Midwest	-0.0694	-0.0839	-0.0763	-0.0746	-0.0766	-0.0342	-0.0505	-0.0479	-0.0532	-0.0547
	(2.07)	(1.87)	(1.78)	(1.69)	(1.73)	(1.24)	(1.53)	(1.46)	(1.62)	(1.53)
West	0.0401	0.0366	0.0351	0.0396	0.0238	0.116	0.112	0.111	0.0974	0.0908
	(0.87)	(0.80)	(0.79)	(0.78)	(0.48)	(3.43)	(3.27)	(3.27)	(2.72)	(2.25)
Constant	0.339	0.327	0.231	0.239	0.735	0.254	0.241	0.208	0.181	0.301
	(7.56)	(5.93)	(3.66)	(2.95)	(4.31)	(7.52)	(6.50)	(4.70)	(3.13)	(2.13)
N	104	104	104	104	101	104	104	104	104	101
R^2	0.25	0.25	0.31	0.31	0.42	0.21	0.22	0.23	0.23	0.26
Mean Dep. Var.	0.338	0.338	0.338	0.338	0.340	0.278	0.278	0.278	0.278	0.283

Notes: The property value trends for 1950 to 1960 are for all owner-occupied properties in the city (even for the "black value" regressions). Black-specific trends cannot be discerned for many cities for 1950 to 1960 due to incomplete reporting in the 1950 census volumes. Samples in the last five columns are restricted to include the same cities as the first three columns. The residential segregation variable is a dissimilarity index from the Cutler, Glaeser, and Vigdor (1999) dataset. Regional assignment follows census convention.

Sources: Property values are from the published volumes of the federal censuses of population and housing. Manufacturing and population variables

for 1960 are based on census data and taken from issues of the U.S. Department of Commerce, County and City Data Book (tabulated in ICPSR 7735 and checked against data compiled by Michael Haines). Riot severity measures are based on data underlying Carter (1986). The crime rate data for 1962 are from the Federal Bureau of Investigation's Uniform Crime Reports. The Cutler, Glaeser, and Vigdor (1999) segregation data are available at www.nber.org.

Table 3B: Riots and Property Values, City-Level Data, 1960-1980

	1: Black	2: Black	3: Black	4: Black	5: Black	6: All	7: All	8: All	9: All	10: All
High Riot Severity	-0.202	-0.193	-0.181	-0.174	-0.140	-0.0804	-0.0708	-0.0667	-0.0745	-0.0645
	(3.21)	(3.28)	(3.17)	(2.90)	(2.05)	(1.23)	(1.14)	(1.08)	(1.23)	(1.05)
Medium Riot Severity	-0.100	-0.0879	-0.0855	-0.0815	-0.0831	-0.0771	-0.0643	-0.0635	-0.0680	-0.0689
	(2.43)	(2.16)	(2.11)	(1.94)	(1.96)	(2.08)	(1.74)	(1.72)	(1.72)	(1.65)
Total Population	-1.04 e-08	-1.38 e-08	-1.70 e-08	-1.64 e-08	-1.19 e-08	9.65 e-09	6.19 e-09	5.02 e-09	4.25 e-09	4.57 e-09
	(0.53)	(0.72)	(0.92)	(0.85)	(1.01)	(0.68)	(0.45)	(0.37)	(0.32)	(0.35)
Percent Black	-0.186	-0.122	-0.141	-0.0975	-0.375	-0.405	-0.338	-0.345	-0.394	-0.496
	(0.73)	(0.47)	(0.53)	(0.37)	(1.35)	(1.82)	(1.56)	(1.53)	(1.64)	(1.94)
Prop. Manu. 1960	-----	-0.00378	-0.00432	-0.00433	-0.00215	-----	-0.00395	-0.00414	-0.00412	-0.00377
		(1.45)	(1.67)	(1.69)	(0.84)		(1.75)	(1.89)	(1.89)	(1.56)
Value Trend 1950-60	-----	-----	0.265	0.241	0.135	-----	-----	0.0952	0.123	0.104
			(1.68)	(1.49)	(0.81)			(0.62)	(0.78)	(0.64)
Crime Rate	-----	-----	-----	-0.905	0.445	-----	-----	-----	1.029	1.312
				(0.61)	(0.31)				(0.69)	(0.83)
Residential Segregation	-----	-----	-----	-----	-1.034	-----	-----	-----	-----	-0.221
					(3.11)					(0.95)
Northeast	-0.189	-0.126	-0.104	-0.0930	-0.183	-0.289	-0.223	-0.215	-0.227	-0.255
	(2.62)	(1.53)	(1.24)	(1.10)	(2.04)	(5.30)	(3.37)	(3.26)	(3.41)	(3.43)
Midwest	-0.227	-0.167	-0.160	-0.153	-0.164	-0.233	-0.171	-0.169	-0.176	-0.187
	(3.53)	(2.11)	(2.06)	(2.04)	(2.21)	(4.27)	(2.77)	(2.77)	(2.95)	(2.90)
West	0.247	0.262	0.260	0.279	0.243	0.283	0.298	0.297	0.276	0.256
	(3.39)	(3.48)	(3.54)	(3.66)	(2.85)	(5.10)	(5.25)	(5.24)	(4.38)	(3.72)
Constant	1.386	1.434	1.353	1.388	2.188	1.400	1.451	1.422	1.383	1.572
	(17.18)	(15.99)	(12.90)	(11.54)	(7.99)	(23.85)	(22.68)	(17.43)	(13.58)	(7.12)
N	104	104	104	104	101	104	104	104	104	101
R^2	0.50	0.51	0.52	0.52	0.60	0.60	0.61	0.61	0.61	0.62
Mean Dep. Var.	1.212	1.212	1.212	1.212	1.214	1.207	1.207	1.207	1.207	1.211

Notes: See notes to table 3A.

Sources: See sources for table 3B.

Table 4: Riots and Black-Owned Property Values, OLS and 2SLS Estimates

	1: OLS, 1960-70	2: 2SLS, 1960-70	3: 2SLS, 1960-70	4: OLS, 1960-80	5: 2SLS, 1960-80	6: 2SLS, 1960-80
Severity Group (0-2)	-0.0716	-0.191	-0.165	-0.101	-0.237	-0.220
	(3.87)	(2.02)	(1.86)	(3.58)	(1.73)	(1.64)
Total Population	1.19 e-09	3.40 e-08	2.60 e-08	-1.06 e-08	2.71 e-08	2.18 e-08
	(0.16)	(1.25)	(1.02)	(0.58)	(0.74)	(0.60)
Percent Black	0.273	0.593	0.505	-0.186	0.181	0.123
	(2.06)	(2.03)	(1.83)	(0.73)	(0.40)	(0.27)
Value Trend 1950-60	-----	-----	0.282	-----	-----	0.172
			(2.55)			(0.85)
Northeast	0.0607	0.141	0.141	-0.189	-0.0967	-0.0979
	(1.26)	(1.78)	(1.92)	(2.66)	(0.82)	(0.85)
Midwest	-0.0687	-0.0014	-0.0164	-0.226	-0.149	-0.159
	(2.03)	(0.02)	(0.26)	(3.52)	(1.44)	(1.56)
West	0.0401	0.106	0.0902	0.247	0.322	0.312
	(0.87)	(1.39)	(1.28)	(3.41)	(2.79)	(2.80)
Constant	0.341	0.312	0.223	1.386	1.352	1.298
	(8.03)	(5.95)	(3.61)	(17.79)	(15.24)	(12.16)
N	104	104	104	104	104	104

Notes: See the text for discussion of severity group variable: group 2 consists of high severity riot cities; group 1 consists of medium riot cities. In columns 2, 3, 5, and 6 rainfall in April 1968 and the presence of a city manager instrument for the riot severity group.

Sources: The city manager instrumental variable is from the Governmental Units Analysis Data (Aiken and Alford 1998; ICPSR 28). Rainfall data are from the National Climatic Data Center website (www.ncdc.noaa.gov). See the notes to table 3A for sources of other variables.

Table 5: Property Values and Riots, Black Household-Level Data, 1970-1980

	1	2	3	4	5	6
High Riot Severity × 1980	-0.160 (8.09)	-0.0804 (3.97)	-0.0149 (0.61)	-0.0570 (3.50)	-0.0230 (1.38)	0.0163 (0.80)
Medium Riot Severity × 1980	-0.0418 (2.03)	-0.0108 (0.52)	-0.0122 (0.59)	-0.0365 (2.20)	-0.0165 (1.00)	-0.0179 (1.08)
Midwest × 1980	-----	-0.0397 (1.97)	-0.0224 (1.05)	-----	-0.0291 (1.71)	-0.0131 (0.73)
South × 1980	-----	0.251 (12.17)	0.164 (6.89)	-----	0.164 (9.45)	0.102 (5.14)
West × 1980	-----	0.440 (19.74)	0.406 (17.51)	-----	0.434 (22.89)	0.405 (20.66)
SMSA Size × 1980	-----	-----	-3.31 e-06 (5.20)	-----	-----	-2.00 e-06 (3.69)
Prop. Manu. × 1980	-----	-----	-0.576 (6.19)	-----	-----	-0.448 (5.79)
1980	0.968 (55.47)	0.765 (32.81)	0.973 (26.48)	0.802 (55.78)	0.660 (34.18)	0.814 (26.91)
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
House Characteristics	No	No	No	Yes	Yes	Yes
R^2	0.47	0.48	0.49	0.64	0.65	0.65
N	32114	32114	32114	32114	32114	32114
Metro Areas	123	123	123	123	123	123

Notes: Sample includes all black household heads. t-statistics are in parentheses, adjusted for heteroskedasticity. SMSA size is based on the number of observations in the IPUMS in 1970, by metropolitan area. Proportion of employment in manufacturing is from the IPUMS 1970 sample, by metropolitan area. Controls for housing characteristics include the number of rooms (linear) and series of indicator variables for: the number of bathrooms; age of building; units in building structure; air conditioning; and heating system type.
Sources: Micro data are from the IPUMS (Ruggles and Sobek 2003). Riot data are based on Carter (1986); see table 1.

Table 6: Property Values and Riots, Black and White Household-Level Data, 1970-1980

	1	2	3	4	5	6
Black × High Riot Severity × 1980	-0.158	-0.115	-0.134	-0.0897	-0.0646	-0.0969
	(7.77)	(5.49)	(5.75)	(5.45)	(3.73)	(5.01)
Black × Medium Riot Severity ×	-0.0494	-0.0264	-0.0340	-0.0272	-0.0162	-0.0259
1980	(2.35)	(1.25)	(1.61)	(1.62)	(0.96)	(1.53)
Black × High Riot Severity	0.0372	0.0136	0.0168	0.0184	0.00428	0.00623
	(2.47)	(0.89)	(1.10)	(1.50)	(0.34)	(0.49)
Black × Medium Riot Severity	0.0199	0.00673	0.00789	0.0137	0.00744	0.00833
	(1.28)	(0.43)	(0.51)	(1.10)	(0.60)	(0.67)
Black × 1980	-0.0477	-0.0640	0.0819	-0.106	-0.127	0.0766
	(2.68)	(2.62)	(2.52)	(7.51)	(6.29)	(2.89)
High Riot Severity × 1980	0.0487	0.0459	0.0803	0.0594	0.0579	0.0912
	(10.08)	(9.48)	(12.85)	(16.65)	(16.20)	(19.61)
Medium Riot Severity × 1980	0.0256	0.0240	0.0264	0.00882	0.00809	0.0106
	(5.42)	(5.08)	(5.56)	(2.61)	(2.39)	(3.13)
1980	0.840	0.841	0.876	0.783	0.784	0.770
	(180.55)	(179.08)	(95.66)	(220.46)	(219.21)	(113.70)
Black	-0.497	-0.488	-0.493	-0.294	-0.280	-0.287
	(31.42)	(27.57)	(27.82)	(22.96)	(19.61)	(20.01)
SMSA Size × 1980	-----	-----	-1.48 e-06	-----	-----	-1.55 e-06
			(8.56)			(11.71)
Black × SMSA Size × 1980	-----	-----	5.06 e-07	-----	-----	1.21 e-06
			(1.06)			(2.95)
Prop. Manu. × 1980	-----	-----	-0.0777	-----	-----	0.0914
			(3.07)			(4.93)
Black × Prop. Manu. × 1980	-----	-----	-0.502	-----	-----	-0.725
			(7.27)			(12.90)
Region × Year	Yes	Yes	Yes	Yes	Yes	Yes
Black × Region	Yes	Yes	Yes	Yes	Yes	Yes
Black × Region × Year	No	Yes	Yes	No	Yes	Yes
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
House Characteristics	No	No	No	Yes	Yes	Yes
R^2	0.53	0.53	0.53	0.74	0.74	0.75
N	418360	418360	418360	418360	418360	418360
Metro Areas	124	124	124	124	124	124

Notes: Sample includes all black and white household heads. t-statistics are in parentheses, adjusted for heteroskedasticity. SMSA size is based on the

number of observations in the IPUMS in 1970, by metropolitan area. The proportion of employment in manufacturing is also calculated using the IPUMS 1970 sample, by metropolitan area. Controls for housing characteristics include the number of rooms (linear) and series of indicator variables for: the number of bathrooms; age of building; units in building structure; air conditioning; and heating system type.
Sources: Micro data are from the IPUMS (Ruggles and Sobek 2003). Riot data are based on Carter (1986); see table 1.