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## An Analysis of Ghetto Housing Prices over Time

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### INTRODUCTION

Less than twenty years ago, an inverse relationship between the unit price of housing in an area and the concentration of blacks there was a generally accepted principle that was frequently offered as a justification for the discriminatory practices of realtors, financial institutions, and innumerable lobbies of concerned citizens. In recent years, however, this hypothesis has been viewed with increasing skepticism, especially by members of the professional research community, who often argue that a chronic shortage of quality housing in established black neighborhoods normally results in ghetto premiums, rather than discounts.

Unfortunately, most empirical evidence regarding the relationship between race and rent pertains to market conditions in the 1950s and early 1960s. In the overwhelming majority of these studies it was found that units located in predominately black neighborhoods were more expensive than otherwise similar dwellings in neighborhoods that were mainly white (Becker 1957, Gillingham 1973, Haugen and Heins 1964, Muth 1969, Rapkin 1966, Ridker and Henning 1967, Wihry 1971). These results were by no means universal (Lapham

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1971, Bailey 1966); and indeed, since the factors that contribute to the price of ghetto housing vary over space and time, there was no reason to expect them to be. Nevertheless, the preponderant finding of ghetto markups during the early 1960s does seem to indicate a certain similarity between a fairly large number of metropolitan areas.

In Tables 4-1 and 4-2, we summarize two such studies, each designed to apply the same methodology to a variety of housing markets. Gillingham, who based his analysis on a relatively rich body of data drawn from the 1960 Bureau of Labor Statistics Comprehensive Housing Survey, found markups ranging from 10 to 23 percent in each of five metropolitan areas; Wihry found similar premiums in nine out of eighteen cities. While the reliability of the latter's estimates are plagued by his reliance on relatively poor aggregate data, his results combined with those of the others cited above suggest that in the past ghetto markups were a relatively common market phenomenon.

Considerably less is known about more recent relationships between housing prices and race. Studies of New Haven in 1968 and 1969 (King and Mieszkowski 1973) and of St. Louis in 1967 (Kain and Quigley 1970) showed racial markups of about 8 percent for

**Table 4-1. Wihry's Analysis of Median Census Tract Rents and Values in Eighteen Central Cities in 1960<sup>a</sup> (dollar premium associated with a 1 percent increase in the proportion of households that are nonwhite)**

<i>Central City</i>	<i>Median Value</i>	<i>Median Rent</i>	<i>Central City</i>	<i>Median Value</i>	<i>Median Rent</i>
Charlotte, N.C.	40.4*	.03	Milwaukee	15.6	.21*
Cincinnati	11.6	.04	Montgomery	6.6	-.06
Cleveland	19.5*	.21*	Norfolk	46.7	-.06
Dayton	0.5	-.02	Paterson-Clifton-Passaic	63.7	.57*
El Paso	-130.1	-.62	Pittsburgh	19.4*	.34*
Flint	21.4	.11*	Rochester	54.1*	.29*
Grand Rapids	15.9	.13	St. Louis	33.4*	.06*
Lansing	-34.6	-.18	Syracuse	118.9	.55*
Louisville	-8.2	-.06	Topeka	-41.8	.03

\*Underlying regression coefficient is significant at 5 percent level or better.

<sup>a</sup>Unit of observation is census tract; model is linear. For all dwelling units, other independent variables included in the regression model are distance from CBD, proportion of dwellings with more than one person per room, proportion of dwellings built during 1940-1960, proportion of dwellings with shared or no bath, proportion of dwellings dilapidated or lacking some or all plumbing facilities, and the median number of rooms per unit. For details, see Wihry (1974).

**Table 4-2. Gillingham's Analysis of BLS Survey Data on Dwellings in Multiunit Structures in Five SMSAs, 1960-1961<sup>a</sup>**

	<i>Rent of Black Households in Stated Block as Percent of Rent of White Households in All-White Blocks</i>		
	<i>Block Less than 20% Black</i>	<i>Block 20-80% Black</i>	<i>Block Over 80% Black</i>
Chicago	12.8*	17.6*	22.9*
Detroit	6.4	9.3*	10.3*
Washington	16.1*	2.2	2.1
Baltimore	13.1	18.8*	17.2*
St. Louis	5.8	4.7	11.4*

\*Underlying regression coefficient is significant at 5 percent level or better.

<sup>a</sup>Unit of observation is the individual dwelling unit in multiunit structures; model is semilog in form. Other independent variables are a set of dummy variables for unit age; set of number-of-room dummies; dummies for more than one bathroom and less than full bath; dummy for furniture and appliance included in rent; dummy for substandard condition; dummies for lack of hot or cold water, central heat, any installed heat, number of persons per room; dummy for garage included in rent; dummy for central air conditioning included in rent; proportions of units on block lacking some plumbing, crowded, and/or in structures with five or more units; and median income of tract. Basic data are from BLS Comprehensive Housing Survey, which are described in U.S. Bureau of Labor Statistics, *The Consumer Price Index: History and Techniques* (Bull. 1517). Results are from Gillingham (1973, Table V-2).

rental units, while Berry and Bednarz (1975) in a study of Chicago from 1970 to 1972 found a small, but statistically significant, discount for owner-occupied homes. Since it is impossible to generalize from these few scattered observations, it is likewise impossible to ascertain the current nature of housing prices in predominantly black neighborhoods.

Additional empirical research based on more recent housing samples is needed now because areal analyses conducted more than fifteen years ago may no longer be applicable to the housing markets of today. While this potential for obsolescence is inherent in most statistical research, it poses a particular problem in the case of racially related rent differentials.

In the late 1960s, an era of legislative and executive reforms began, designed to end overt discrimination in the housing market and the mortgage insurance industry. Government attempts to promote equal opportunity in housing, coupled with a rapid rate of white suburbanization and a decline in the growth of the urban black population, may have increased the black sector's ability to expand in response to housing shortages, making excess demand in black

neighborhoods a less frequent market occurrence. If this hypothesis is correct, it would make earlier econometric estimates inappropriate, and indeed, would lead one to expect that the large ghetto markups of the early 1960s are a less common phenomenon today.

In this study, we examine the changes that have occurred in the relative prices of ghetto housing in two cities—Boston and Pittsburgh—and attempt to relate those changes to observable population and housing trends. The analysis is based on data that was obtained primarily from the 1960 and the 1970 censuses of Population and Housing. By applying the same two-tiered econometric technique to each of our four separate samples (Boston, 1960; Boston, 1970; Pittsburgh, 1960; Pittsburgh, 1970), we obtained price estimates that are reasonably comparable over cities and over time.

Boston and Pittsburgh were selected in order to test the overall importance of demand in sustaining housing premiums for blacks. The two cities began the decade with roughly similar characteristics: each was about the same size; each had a relatively small black population; and each registered a significant ghetto markup. However, between 1960 and 1970, the number of blacks in Boston grew by about 62 percent, compared to a 5 percent rise in Pittsburgh. If the supply response was sluggish, this divergence could have an important impact on the relative price of ghetto housing. Yet in spite of the differential growth of the black population in the two cities, estimated ghetto markups fell significantly in both.

The remainder of the study is divided as follows: (1) a summary of the various factors that might contribute to the overall relationship between housing prices and race; and (2) estimates of racially related price differentials and the econometric procedure by which they were obtained. Our hypothesis is that the premiums observed in the 1960 samples were primarily the result of an initial shortage of quality housing in predominantly black neighborhoods, and that their subsequent disappearance signaled an alleviation of that shortage. (3) We examine aggregate trends within the black sectors of the two markets in an attempt to determine whether or not actual market developments are consistent with our basic supply hypotheses, and offer some tentative reasons for the hypothesized supply response. (4) We summarize the major findings of the analysis.

## HOUSING PRICES AND RACE

A variety of factors act to determine the overall relationship between housing prices and race. A primary distinction can be made between neighborhood and household markups. The former refers to differen-

tials that are borne by all households at a given locale, irrespective of the individual's race; the latter—known as “discriminatory mark-ups”—reflect systematic differences in the prices households pay for similar dwellings in the same neighborhood, and presumably arise from the discriminatory behavior of landlords, realtors, and financial intermediaries.

Neighborhood differentials have caused perhaps the greatest confusion in the debate over the relationship between housing prices and race. In any given market, the relative price of housing in racially segregated neighborhoods reflects a complicated interplay of long-run and short-run forces which can conceivably work in opposing directions. If it is assumed that the market is in long-run equilibrium or that households are perfectly mobile, rent differentials will necessarily reflect the neighborhood racial preferences of households.<sup>1</sup> If blacks are effectively color blind and if whites prefer living near whites, prices will fall with increases in an area's concentration of blacks; if blacks, like whites, dislike racially mixed neighborhoods, the relationship between racial mix and rents will be U-shaped, with the relative price in the segregated zones determined by the incomes and the tastes of the two groups.

Once the assumption of long-run equilibrium is abandoned, the one-to-one correspondence between household tastes and housing prices disappears. At any given point in time, prices will reflect temporary or chronic disturbances in the housing market, as well as the more fundamental influences of racial externalities. If these disturbances are large enough or persistent enough, rent differentials may arise that are inconsistent with household tastes. Over time, the market will act to eliminate these temporary differentials, as households change their zone of residence and as the stock of housing expands in areas of excess demand. But given the many barriers that may limit the black sector's ability to expand, this adjustment process may be painfully slow.

Several factors operate to reduce the overall mobility of black households, rendering them particularly vulnerable to disturbances of this sort. In many areas, a fairly large fraction of blacks are recent migrants to the city and, accordingly, may have an inadequate knowledge of the housing opportunities throughout the metropolitan area. Mobility may also be restricted by factors such as poverty and overt market discrimination. Combined with an inelastic supply of housing, these factors may greatly reduce the ability of the black sector of the market to adjust to conditions of excess demand, and can produce short-run differentials with or without market externalities (Becker 1957; Haugen and Heins 1964). Supply restrictions

need not be general for market premiums to appear; if the stock of housing available to blacks does not suit their needs, desired units may rent or sell at significant markups even with a relatively loose market for other types of dwellings (Kain 1969).

An additional factor that might produce racially related neighborhood price differentials stems from the possibility of discriminatory behavior on the part of financial intermediaries. If race is viewed as synonymous with vandalism, decay, and abandonment, credit terms in the ghetto may be relatively poor and insurance relatively expensive when compared to the rates that are charged in otherwise similar white neighborhoods. The effect of such behavior on the price of housing should vary by tenure, in general reducing the value of owner-occupied dwellings while increasing the level of rents. With restricted household mobility and with an inelastic supply of housing, differentials of this sort could persist over relatively long periods of time.

In contrast to these neighborhood price differentials, which by definition are borne by all households regardless of their race, "discriminatory markups" refer to differential rents or values within a particular area. Becker's basic model of discrimination can be used to predict rental markups in white and in border neighborhoods where landlords either have an aversion toward blacks or believe that such households will decrease the rental value of their property (Becker 1957). Potential black buyers in these same areas may be subject to similar markups because of their own inability to bargain with potential white sellers or the reluctance of brokers to disturb established racial patterns or because more stringent mortgage conditions are imposed on blacks than on whites by financial intermediaries who associate integration with declining property values (Kain and Quigley 1974, especially Chap. 3). However, since the economic rationale for such discriminatory behavior will disappear in neighborhoods that are predominantly black, and since the bargaining position of blacks within these areas will be relatively strong, differential rents within the ghetto seem somewhat improbable. What little evidence there is tends to support the basic premise that discriminatory markups are essentially a border phenomenon (Bailey 1966; King and Mieszkowski 1973).

It should be noted that not all household markups need be discriminatory. Certain characteristics of the family—such as number of children or of persons per room—may be associated with an above-average amount of wear and tear and may result in increased maintenance expenditures or a more rapid depreciation of the unit. These additional costs will not affect the value of an owner-occupied

unit, holding dwelling quality constant; however, they may induce market rent differentials, given that landlords can pass on part if not all of these costs to their tenants. Differentials of this sort are not discriminatory in nature and should not be confused with markups arising from racial differences alone. Accordingly, empirical analyses of market discrimination should control for systematic variations in those characteristics of rental households that are correlated with race and cause above-average wear and tear on the unit.

This fairly long list of contributing factors should illustrate some of the basic difficulties involved in determining a causal relationship between housing prices and race. Since any of the elements mentioned above can vary across cities and over time, the pattern of prices can also be expected to vary. However, the prevalence of ghetto markups during the early 1960s indicates a certain similarity between a fairly large number of metropolitan areas. By examining ghetto markups in 1960 and their change over time in two cities, we attempt to discover whether the basic factors producing the observed differentials are likely to be operative in the housing markets of today.

## ECONOMETRIC ESTIMATES OF HOUSING PREMIUMS ASSOCIATED WITH RACE

### Methodology

To estimate the price of ghetto housing in each of our four samples, we regressed rents and housing values on the characteristics of the unit and its neighborhood. The primary focus of our analysis is on the coefficient of one of these neighborhood variables—the concentration of blacks in a neighborhood—which measures the marginal effect of race on rent.

Our underlying model assumes a linear and additive relationship between the logarithm of housing prices and housing attributes:

$$\ln R_{it} = \sum_j \alpha_j X_{jit} + \sum_k \beta_k N_{kit} + \epsilon_{it} \quad (4-1)$$

where  $R_{it}$  is the rent or value of the  $i$ th unit in neighborhood  $t$ ;  $\{X_j\}$  and  $\{N_k\}$  are sets of variables describing the  $j$  structural and  $k$  neighborhood attributes of the dwelling; and  $\epsilon_{it}$  is a random error which is normally distributed with zero mean and constant variance.<sup>2</sup> In our analysis we assume that units in the same census tracts are in the same neighborhood; so  $N_{kit} = N_{k1t}$  for all units  $i$  or 1 in tract  $t$ .

The coefficients in Equation (4-1) are estimated in two steps,

using two distinct data sets, a procedure necessitated by the lack of a single data source containing all the requisite information. In Stage I, rents and housing values are regressed on the structural characteristics of the unit, using micro data obtained from the One-in-a-Hundred Public Use Sample. In Stage II, the  $\alpha$ 's in Equation (4-1) are replaced by the estimated Stage I parameters and the structural variables are brought over to the left-hand side of the equation. Averaging observations within census tracts yields an equation which is easily estimated from tract statistics:

$$\ln R_t - \sum_j \hat{\alpha}_j \bar{X}_{jt} = \sum_k \beta_k N_{kt} + \bar{f}_t \quad (4-2)$$

where bars indicate tract averages and  $\bar{f}_t$  is the tract average of  $f_{it} = \epsilon_{it} + \sum (\alpha_j - \hat{\alpha}_j) X_{jit}$ . To reduce the heteroscedasticity associated with averaged data, observations in the Stage II regressions were weighted by the square root of the number of dwellings in the tract.

Since the tract data from the 1960 census do not differentiate dwellings by tenure, owner-occupied and rental units had to be merged in the second stage of the analysis. To do this, we used the tenure-specific Stage I equations to calculate a rent-value ratio for each tract within the sample on the basis of the structural characteristics of the dwelling units contained in that tract. Using this ratio, we converted market values into market rents, and then combined these imputed rents with the actual gross rents of the tract's rental units. Thus, the dependent variable in the Stage II equations is the difference between the composite tract rent just described and the tract rent that is predicted from the Stage I regression for renters.

This general econometric technique gives rise to two types of possible parameter bias. The first is produced when tenure groups are merged in the Stage II equations. Given that at least one of the  $\beta$ 's varies by tenure, it is difficult to predict the precise relationship between the actual tenure-specific parameters and the coefficients derived from the unstratified sample. However, with the 1970 data it was possible to distinguish owners from renters at the tract level and to run separate Stage II equations. When the coefficients from these regressions were compared to the coefficients from our basic "combined" equation, the bias associated with merging was found to be small. Most of the combined parameters were bracketed by the corresponding coefficients from the owners' and renters' equations, and when they fell beyond this range, the discrepancies were generally minor.

The second source of parameter bias stems from the two-tiered nature of the regression analysis. If  $\{X\}$  and  $\{N\}$  are correlated, the

Stage II estimates of  $\beta$  will be biased toward zero. To reduce this error, the two neighborhood proxies that appear in the Public Use Sample were included in the Stage I regressions: one signified a white household head; the other, a central-city location. Although these proxies are admittedly crude, they probably capture most of the correlation between  $\{X\}$  and  $\{N\}$ , thereby reducing parameter bias. These two neighborhood variables are included in the Stage I equations to improve our estimates of  $\alpha$ . Since their coefficients are undoubtedly biased, they are not used to calculate predicted tract rents in the Stage II analysis, but instead are set at their mean SMSA values.

Fortunately, the general efficacy of this procedure could be tested by using an expanded version of the 1970 Public Use Sample, available for Boston but not for Pittsburgh. This alternative file describes the unit's neighborhood, as well as its basic structural attributes, and makes it possible to include a fairly large number of neighborhood variables in the underlying Stage I equations. This modification should produce reasonably unbiased estimates of the Stage II neighborhood parameters. When these revised estimates of  $\beta$  were compared to the coefficients derived from our basic estimation procedure, the bias in the latter parameter set was found to be small.<sup>3</sup>

### Estimated Racial Differentials

In the tabulation below, we show the estimated racially induced rent differentials for each of the two cities in each of the two sample years (the figures in parentheses are  $t$  ratios; the square of the proportion black was not used in the final regressions for Boston 1970 and Pittsburgh):<sup>4</sup>

	<i>Boston</i>		<i>Pittsburgh</i>	
	<i>1960</i>	<i>1970</i>	<i>1960</i>	<i>1970</i>
Proportion black	-0.1166 (1.490)	-0.0488 (1.471)	0.219 (4.02)	-0.344 (4.16)
Proportion black squared	0.2392 (2.280)			0.416 (4.57)

In each question, we experimented with linear and quadratic variants of the racial variable; the coefficients presented in the table are those that provided the best overall fit. Since the regressions use the semilog form, the estimated racial parameters depict the proportional price effects of variations in the concentration of blacks in a neighborhood.

The large number of neighborhood and structural attributes that were included in the underlying regression equations should make the coefficients in the table fairly reliable indicators of the net relationship between housing prices and race. The set of Stage I structural attributes is somewhat incomplete in that census statistics do not contain explicit measures of size or quality. However, this omission need not bias  $\beta$ , since the influence of the excluded structural attributes will probably be captured by variables that measure the number of rooms and baths, and the presence of central heat and central air conditioning. The set of Stage II neighborhood attributes is more comprehensive; while the variables differ by city and to a certain extent by year, in each regression they describe the tract's general socioeconomic status, its accessibility to employment, the quality of its public services, its general physical attractiveness, its ethnicity, and the racial composition of its residents.<sup>5</sup>

The coefficients in the foregoing table reveal a common trend: between 1960 and 1970, both cities experienced a net decline in the relative price of ghetto housing. This changing relationship between race and rent is depicted in Figure 4-1, where the estimated rent differentials are plotted against the percent black in the neighborhood. In Boston, the 1960 differentials were U-shaped, with minimum rents found in neighborhoods that were 25 percent black and rents in the ghetto some 12 percent higher than rents in otherwise identical all-white zones. In 1970, these premiums disappeared, and prices declined steadily as the concentration of blacks in a tract increased, with ghetto rents at least 5 percent lower than rents in all-white neighborhoods. Since in 1960 over half of Boston's black population lived in areas displaying premiums, the observed decline in relative prices affected a fairly large fraction of the area's black population.

Declines in the relative price of housing were also evident in Pittsburgh. In 1960, the relationship was linear, with rents rising steadily with the degree of concentration of blacks in a tract, reaching a maximum of about 20 percent in essentially all-black tracts. In 1970, the relationship was U-shaped, with tracts that were 40 percent black having rents some 7 percent lower than in otherwise identical all-white tracts. While rents in all-black tracts continued to be high, the differential between white and black tracts was reduced from 20 to 7 percent.

Alternative functional forms depicting the relationship between race and rent are consistent with the general relationships described

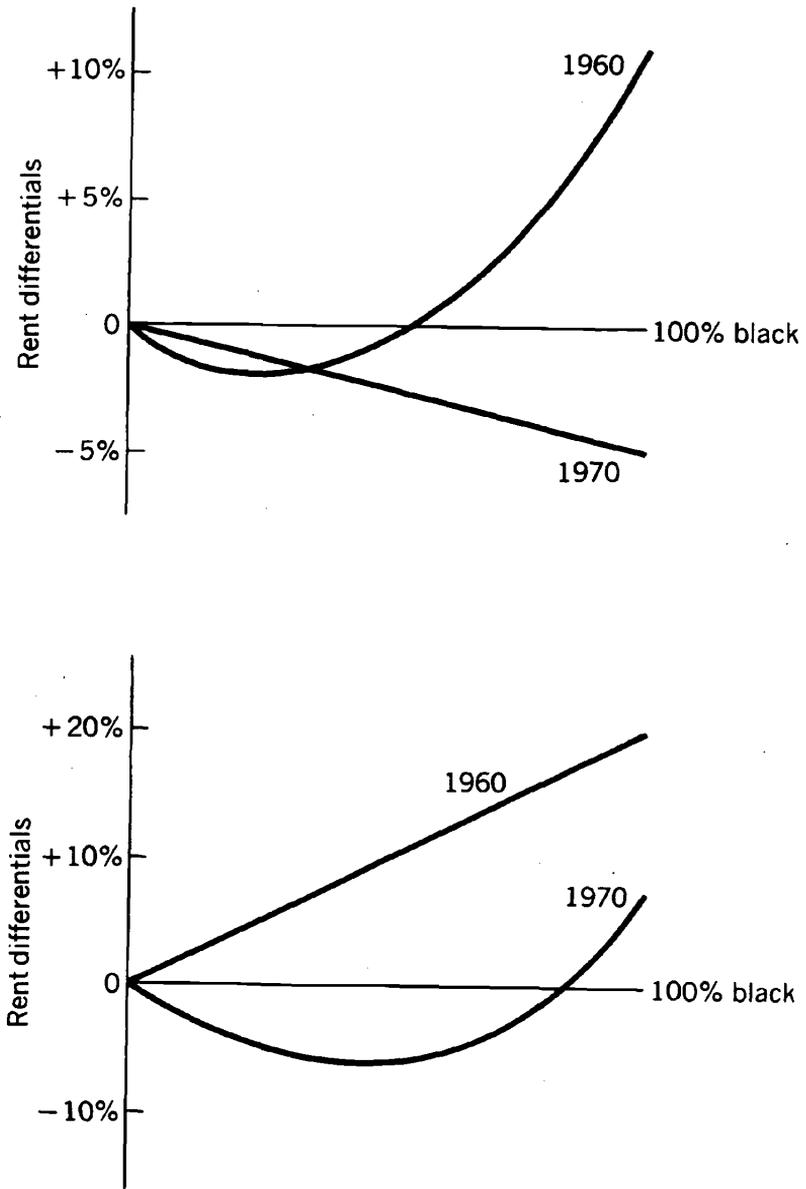


Figure 4-1. Estimated Rent Differentials in Boston and Pittsburgh.

above. When the squared term was dropped from the 1960 Boston regressions,  $R^2$  fell, but the estimated ghetto premiums remained about the same. In Pittsburgh the linear form proved insignificant in the 1970 sample, and as a result the quadratic results presented in the preceding tabulation provide a conservative estimate of the net decline in housing prices in predominantly black neighborhoods.

These estimated declines in the relative price of ghetto housing over the decade probably reflect the alleviation, if not the elimination, of a relative shortage of housing in predominantly black neighborhoods. We included a vacancy variable in the Stage II equations, but a relative abundance of low-quality, deteriorating dwellings may have masked an excess demand for housing in the average to above-average quality range. Accordingly, in the remainder of the study we explore the growth and composition of the black market in each of the two cities to see if the data are at least consistent with an hypothesis of this sort.

We should note that other hypotheses are consistent with the trends detected in our sample. The decline in relative prices may reflect an increased willingness on the part of blacks to live in racially integrated neighborhoods. However, it seems unlikely that externalities are the only factor at work, since it is doubtful that a preference for self-segregation on the part of an economic minority would produce markups as large as 20 percent in the absence of a relative housing shortage.

One might also argue that the premiums observed in our 1960 samples were household rather than neighborhood markups, and that their subsequent reduction stemmed from the elimination of differential white and black rents within established black areas. The aggregate data used in the Stage II regression equations do not enable us to test this hypothesis directly; average rents in predominantly black tracts may have been high because a large fraction of their inhabitants paid discriminatory differentials or because the areas themselves commanded premiums. However, since this first type of markup is unlikely in neighborhoods where the majority of households are black, it seems reasonably safe to assume that the elimination of individual discriminatory markups was not the primary source of the observed decline in the relative price of ghetto housing.

Finally, the observed price declines may simply be a statistical aberration reflecting biases induced by the omission of quality variables in the underlying Stage I equations. As noted earlier, census data do not provide much information on the overall condition of a housing unit. This omission could induce a decline in the estimated

ghetto markups if (1) quality was inversely related to the neighborhood's concentration of blacks and if (2) the price of the omitted quality attributes tended to increase over time. Increases in the real incomes of blacks might produce a price response that is consistent with condition 2 and could account for part of the observed change in the relative price of ghetto housing. Although we suspect that the resulting bias would be relatively small, in the absence of additional empirical evidence it is impossible to dismiss this hypothesis.

## **AN ANALYSIS OF THE BLACK HOUSING SUBMARKETS IN BOSTON AND PITTSBURGH**

If the 1960 ghetto premiums were the result of excess demand for quality housing in predominantly black neighborhoods and if their subsequent reduction stemmed from an alleviation of those shortages, these developments should be reflected in the net movements of demand and supply in the black sectors of the two housing markets. Accordingly, we now test whether changes in the growth and composition of the black submarkets in Boston and Pittsburgh are at least consistent with our basic supply hypothesis. We precede our analysis with a brief summary of market-wide trends in each of the two SMSAs.

Table 4-3 is a summary of twenty-year trends in population, housing, and income in the Boston and Pittsburgh SMSAs. Between 1950 and 1960, the two areas were remarkably similar: each grew by about 200,000 people, underwent suburbanization at a fairly rapid rate, and gained about 26,000 blacks. Since the latter increases occurred almost entirely within the central city, they undoubtedly placed severe strains on the stock of housing in established black neighborhoods, and could easily account for the large ghetto markups we detected in our two 1960 samples.

The experience of the 1960s is more puzzling. Although the two cities began to diverge in ways that could directly affect the fundamental relationship between housing prices and race, their price behavior was similar. The observed decline in the relative price of ghetto housing in Pittsburgh is not surprising in light of the data in Table 4-3, which indicate a situation of overall stagnation, with an increasingly slack central-city market—the home of most of the area's blacks—and a relatively stable black population.

In contrast, the aggregate trends in Boston seem to oppose the notion that falling relative ghetto prices are the direct result of an alleviation of an initial shortage of housing. During the 1960s, Boston continued to register a rapid increase in its black population,

**Table 4-3. Selected Characteristics of Boston and Pittsburgh, 1950-1970**  
(figures in parentheses are proportional rates of growth)

	<i>Pittsburgh</i>			<i>Boston</i>		
	1950	1960	1970	1950	1960	1970
<b>SMSA characteristics</b>						
Population (000 omitted)						
Total	2,213	2,405 (+8.7)	2,401 (-0.2)	2,370	2,589 (+7.4)	2,754 (+6.1)
White	2,077	2,244 (+8.0)	2,231 (-0.6)	2,318	2,512 (+8.3)	2,627 (+4.6)
Black	136	162 (+18.0)	170 (+5.2)	52	78 (+50.8)	127 (+62.3)
Proportion black	0.062	0.067	0.071	0.022	0.030	0.046
Median real family income (1967 = 100)						
Total	4,632	6,579 (+42.0)	8,365 (27.1)	5,059	7,731 (+52.8)	9,811 (+26.9)
White <sup>a</sup>	NA	6,724	8,560 (+27.3)	NA	7,812	9,990 (+27.9)
Black	NA	4,269	5,448 (+27.0)	NA	5,141	5,777 (+12.4)
Relative black income	NA	0.63	0.64	NA	0.66	0.58
Vacancy rate	0.009	0.023	0.023	0.010	0.024	0.023
Proportion of population in central city						
Total	0.31	0.25	0.22	0.34	0.27	0.23
White	0.29	0.22	0.19	0.33	0.25	0.20
Black	0.61	0.62	0.62	0.78	0.81	0.82
<b>Central-city characteristics</b>						
Population (000 omitted)						
Total	677	604 (-10.7)	520 (-13.9)	801	697 (-13.0)	641 (-8.0)
White	594	504 (-15.3)	415 (-17.6)	761	634 (-16.7)	536 (-15.4)
Black	83	101 (+22.1)	105 (4.2)	40	63 (+58.0)	105 (+65.7)
Proportion black	0.122	0.167	0.202	0.050	0.091	0.163
Median real family income						
Total	4,590	6,193 (+34.9)	7,560 (+22.0)	4,675	6,644 (+42.1)	7,826 (+17.8)
White	NA	6,550	8,110 (+23.8)	NA	6,826	8,299 (+21.6)
Black	NA	4,235	5,238 (23.6)	NA	4,896	5,434 (+11.0)
Relative black income	NA	0.65	0.65	NA	0.72	0.65
Vacancy rate	0.008	0.026	0.038	0.009	0.039	0.046

Table 4-3 (cont.)

	Pittsburgh			Boston		
	1950	1960	1970	1950	1960	1970
Suburban characteristics						
Population (000 omitted)						
Total	1,536	1,801	1,881	1,569	1,892	2,113
		(+17.2)	(+4.4)		(+20.6)	(+11.7)
White	1,483	1,740	1,816	1,557	1,878	2,090
		(+17.4)	(+4.4)		(+20.6)	(+11.3)
Black	54	61	65	12	15	22
		(+13.0)	(+6.9)		(+25.3)	(+46.7)
Proportion black	0.035	0.034	0.035	0.007	0.008	0.011
Vacancy rate	0.009	0.021	0.018	0.010	0.018	0.015

<sup>a</sup>Median income for whites is estimated by taking a weighted average of the median income of black families and of all families.

and at the same time experienced a deceleration in the rate of white migration from the central city. These macro developments seem to imply increased pressures on the black housing market, and make the observed decline in prices somewhat unexpected.

To achieve a fuller understanding of these trends, we undertook a detailed analysis of movements within the black and white sectors of the central cities of each of two sample areas. Through this disaggregated approach we were able to relate changes in the housing stock and population of those areas to the observed declines in the relative price of ghetto housing and to establish the overall plausibility of our basic supply hypothesis. Although our analysis remains conjectural, we were able to isolate several key factors that could conceivably explain the trends we observed in our samples.

### Boston

In Boston the majority of black households live in one centrally located cluster of physically contiguous tracts. This general pattern has remained essentially constant over the last twenty years. Between 1950 and 1970, the proportion of blacks in the city increased from 78 to 82 percent, even though the number of suburban blacks grew from about 12,000 to 22,000. This extreme concentration of blacks within the central city enables us to restrict our analysis primarily to demand and supply developments that occurred within its bounds.

The aggregate census data presented in Table 4-3 provide some clue to the overall growth in black housing demands between 1950 and 1970. The number of central-city blacks increased by 58 percent

in the 1950s and by 65 percent in the 1960s, a roughly similar pattern of growth that was maintained by a relatively high rate of immigration to the metropolis. During the 1960s, at least, this growth was accompanied by a rise of about 11 percent in the real income of central-city blacks, a relatively modest gain when compared to the 22 percent rise for whites. Thus, in each decade, there appears to have been a significant increase in the number of units demanded by blacks as well as a moderate increase in their average quality demands. Although there probably was a slight acceleration in the overall growth of demand in the 1960s, the experience of the two decades was not remarkably different.

Census data also provide clues to the overall change in supply, although the various patterns are often difficult to decipher. Some general trends can be discovered by dividing central-city tracts into three mutually exclusive groups: established black neighborhoods (type 3); border neighborhoods (type 2); and predominantly white neighborhoods (type 1). Type 3 areas are tracts with a population at least 20 percent black,<sup>6</sup> type 2 neighborhoods include all tracts immediately adjacent to such areas, and type 1 areas include the remainder of the central city. In Table 4-4, we display some pertinent characteristics of the housing stock and population of each neighborhood type in each of three census years.

Two general trends are immediately evident from that table. The first is the distinct increase in both the size and overall quality of housing in the established black areas of the city (type 3 tracts). Size increases are indicated by the rise in the fraction of units in single-family structures, from 6 percent in 1950 to 19 percent in 1970. Although these improvements occurred in each decade, during the 1960s they were offset by an accompanying rise in the size of the average black household, and as a result, there was a slight increase in the fraction of crowded units.

Census indicators of quality also increased. Between 1950 and 1970, the fraction of units with complete plumbing facilities rose from 66 to 85 percent; with central heat, from 61 to 78 percent; and with more than one bath, from about 3 (in 1960) to 7 percent. Again, with the exception of the heating variable, these increases occurred in both decades, implying a continual improvement in housing quality in type 3 neighborhoods throughout the twenty-year period. While housing quality also rose in other areas of the city, the gap between type 3 and type 1 areas decreased, even though the ratio of incomes in these two neighborhood types fell from about 0.70 in 1950 and 1960 to about 0.63 in 1970.

This apparent improvement in the stock of housing in pre-

Table 4-4. Housing and Demographic Trends in Boston, by Tract Type, 1950-1970

	1950			1960			1970		
	Type 1	Type 2	Type 3	Type 1	Type 2	Type 3	Type 1	Type 2	Type 3
Population (thous.)	617.0	130.1	54.3	483.0	118.9	97.2	365.8	148.0	137.6
No. of units (thous.)	170.5	36.0	15.6	155.3	50.2	34.5	130.0	58.8	48.3
Mean rent <sup>a</sup> (dol.)	40	39	32	78	73	66	130	133	106
Mean value (thous. dol.)	9.7	6.7	6.1	13.0	11.6	7.4	18.6	16.0	13.0
Percent owner-occupied	29	12	12	36	16	16	33	19	18
Percent single family	15	05	06	22	09	10	16	14	19
Percent duplex	22	11	10	21	07	10	23	12	12
Percent complete plumbing	88	80	66	91	86	79	93	89	85
Percent central heat	74	74	61	82	88	81	83	86	78
Age (years)									
0-10	5	8	3	7	4	3	10	7	6
11-20	5	1	2	4	3	4	6	3	5
Over 21	91	91	95	89	93	93	84	90	89
Percent more than one bath	NA	NA	NA	7	5	3	13	9	7
Percent black	1	7	55	1	5	55	1	5	68
Mean real family income <sup>b</sup> (thous. dol.)	4.0	3.2	2.9	8.1	7.3	5.7	9.9	9.3	6.3
Percent vacant and available for rent or sale	1	1	1	3	5	6	3	4	9
Crowding (percent)									
Under 0.5 persons per room	NA	NA	NA	45	46	46	52	47	44
Over 1.0 persons per room	NA	NA	NA	8	7	11	6	7	9

<sup>a</sup>Contract rent in 1950; gross rent in 1960 and 1970.

<sup>b</sup>Data for 1950 include unrelated individuals.

dominantly black neighborhoods occurred both through the peripheral expansion of the ghetto into neighborhoods with superior housing units and through a net upgrading of the stock in established type 3 areas. In Table 4-5, we depict the ten-year changes for two kinds of neighborhoods: incorporated tracts, which went from types 1 and 2 to type 3 during the decade; and established tracts, which were type 3 at both the beginning and end of the period. In each decade net increases were registered in the overall quality of units in established ghetto areas, a development that could reflect either an upgrading of existing units or an abandonment of the poorest-quality dwellings. Peripheral expansion into higher-quality areas also contributed to the improved stock of housing, although a comparison of this stock between 1960 and 1970 offers some evidence that incorporation was accompanied by a net decline in the level of housing services.

The second major trend that is evident from Table 4-4 is the dramatic increase in the vacancy rates in predominantly black neighborhoods, from less than 1 percent in 1950 to more than 9 percent in 1970. This trend reflects net shifts in the population between the central city and the suburbs and within and between the three types of central-city tract. The precise nature of these shifts is revealed in Table 4-6, in which border and established black tracts are divided into four groups on the basis of their initial concentration of blacks and developments in the latter tracts are distinguished from developments in tracts that were type 1 at the beginning of the period. Several type 1 tracts that became type 3 during the 1960s are also distinguished from those that were still predominantly white in 1970.

In both decades, integrating and established black tracts accounted for a large fraction of the net decline in the city population—about 53 percent during the 1950s and 78 percent during the 1960s. This rapid rate of white out-migration from racially mixed areas led to population declines in both border and established black areas in spite of the concurrent growth in the city's black population. Since black growth was for the most part directed toward border tracts, neighborhoods with the highest initial concentrations of blacks experienced the largest proportional population declines. As whites fled from the path of ghetto expansion and as blacks moved from the most heavily black tracts, the ghetto market grew increasingly slack, despite frequent declines in the net housing stock in both incorporated and established areas.

Together, these two trends depict a general process of ghetto upgrading and expansion that could presumably work to alleviate an

Table 4-5. Net Changes in the Stock of Housing in Boston, 1950-1960 and 1960-1970 (figures in parentheses are growth rates)

	1950-1960				1960-1970			
	Incorporated Tracts		Established Tracts		Incorporated Tracts <sup>a</sup>		Established Tracts	
	1950	1960	1950	1960	1960	1970	1960	1970
Population (thous.)	77.9	63.7	54.3	33.5	78.2	71.4	97.2	61.4
Whites	71.7	36.9 (-48%)	24.4	6.4 (-74%)	74.3	31.4 (-58%)	43.7	11.1 (-74%)
Blacks	6.2	26.8 (+332%)	29.9	27.1 (-9%)	3.9	40.0 (+926%)	53.5	50.3 (-6%)
No. of units (thous.)	21.3	23.1	15.6	14.4	24.8	23.9	34.5	23.5
Mean rent (dol.)	39	68	32	62	72	108	66	104
Mean value (thous. dol.)	6.6	8.0	6.1	6.3	10.0	13.5	7.4	12.7
Percent owner-occupied	15	16	12	15	22	21	16	18
Percent single-family	6	8	6	14	9	17	10	19
Percent complete plumbing	84	83	66	72	95	89	79	89
Percent central heat	74	84	61	77	88	79	81	84
Percent more than one bath	NA	3	NA	4	3	6	3	8
Percent black	8	42	55	81	5	56	55	82
Mean real family income (thous. dol.)	3.5 <sup>b</sup>	5.9	2.9 <sup>b</sup>	5.3	6.5	6.3	5.7	6.4
Percent vacant and available for rent or sale	1	5	1	6	3	9	6	10
Crowding (percent)								
Under 0.5 persons per room	NA	NA	NA	NA	43	43	46	49
Over 1.0 persons per room	NA	NA	NA	NA	9	11	11	8

NA = not available.

<sup>a</sup>Excludes some tracts whose boundaries changed during the decade.

<sup>b</sup>Data include unrelated individuals.

Table 4-6. Net Population Movements in Boston, 1950-1970 (percent)

	1950-1960					1960-1970 <sup>a</sup>						
	Border		Established		Rest of City	Border		Established		Rest of City		
	Initial Percent Black		50+			Initial Percent Black		50+				
	0-10	10-20	20-50	50+	0-10	10-20	20-50	50+	Incorporated	Other		
<b>Population</b>												
Initial	93.6	36.5	15.0	39.3	617.0	84.5	19.4	30.2	57.7	483.0	33.7	449.3
Final	75.5	25.6	9.5	24.4	564.1	79.9	15.9	23.9	37.6	466.4	31.7	434.6
Net change	-18.1	-10.9	-5.5	-14.9	-52.9	-4.6	-3.5	-6.3	-20.1	-16.6	-2.0	-14.7
Proportionate change	-0.19	-0.30	-0.37	-0.38	-0.08	-0.05	-0.18	-0.21	-0.35	-0.03	-0.06	-0.03
<b>Whites</b>												
Initial	90.0	31.3	10.9	14.1	615.5	82.9	16.6	21.4	15.7	480.0	32.7	447.3
Final	56.1	15.8	2.2	4.5	556.3	62.4	7.0	6.9	4.0	442.7	15.7	427.0
Net change	-33.9	-15.5	-8.7	-9.6	-59.2	-20.5	-9.6	-14.5	-11.7	-37.3	-17.0	-20.3
Proportionate change	-0.38	-0.50	-0.80	-0.68	-0.10	-0.25	-0.58	-0.68	-0.75	-0.08	-0.52	-0.05
<b>Blacks</b>												
Initial	3.6	5.2	4.5	25.2	1.5	1.6	2.8	8.8	42.0	3.0	1.0	2.0
Final	19.4	9.8	7.3	19.9	7.8	17.5	8.9	17.0	33.6	23.7	16.0	7.6
Net change	+15.8	+4.6	+2.8	-5.3	+6.3	+15.9	+6.1	+8.2	-8.4	+20.7	+15.0	+5.6
Proportionate change	+4.39	+0.88	+0.62	-0.21	+4.20	+9.94	+2.18	+0.93	-0.20	+6.90	+15.0	+2.80
<b>Proportion black</b>												
Initial	0.04	0.14	0.30	0.64	0	0.02	0.14	0.29	0.73	0.01	0.03	0
Final	0.26	0.38	0.77	0.82	0.01	0.22	0.56	0.71	0.89	0.05	0.51	0.02
Change	+0.22	+0.24	+0.47	+0.18	+0.01	+0.20	+0.42	+0.42	+0.16	+0.04	+0.48	+0.02
<b>Number of units</b>												
Initial	26.4	9.6	4.3	11.3	170.5	34.2	6.2	11.9	22.5	155.3	10.4	144.9
Final	32.2	10.3	2.9	10.8	186.8	33.8	5.6	8.4	15.2	162.8	10.5	152.3

Proportion vacant												
Initial	0.01	0.01	0.02	0.00	0.01	0.04	0.06	0.06	0.06	0.03	0.02	0.03
Final	0.07	0.07	0.05	0.07	0.03	0.05	0.10	0.08	0.11	0.03	0.08	0.03
Crowding												
Proportion under 0.5 person per room												
Initial	NA	NA	NA	NA	NA	0.48	0.39	0.41	0.48	0.45	0.42	0.45
Final	NA	NA	NA	NA	NA	0.48	0.46	0.45	0.52	0.51	0.38	0.52
Proportion over 1.0 person per room												
Initial	NA	NA	NA	NA	NA	0.06	0.13	0.11	0.10	0.08	0.08	0.08
Final	NA	NA	NA	NA	NA	0.07	0.14	0.09	0.07	0.06	0.08	0.06

NA = not available.

<sup>a</sup>Excludes some tracts whose boundaries were redrawn between 1960 and 1970.

excess demand for quality housing within the predominantly black sectors of the city. Nevertheless, the similarities between the experiences of the two decades seem somewhat inconsistent with the observed decline in the relative price of ghetto housing. Since black demand rose at roughly the same rate in each of the two periods, one would expect a roughly similar pattern of prices at the end of each decade.

Of course, it is possible that the relative price of ghetto housing was even higher at the beginning of the twenty-year period and that the decline that occurred between 1950 and 1960 was similar in magnitude to the one we detected in our samples. However, if this basic premise is unacceptable—and unfortunately, we do not have the means either to refute or support it—one must determine why a roughly similar increase in black demand produced a premium in 1960 and a discount in 1970.

A reexamination of some of the variables described in Tables 4-3, 4-4, and 4-5 does point to two differences between the decades that could conceivably account for the differential pattern of prices. The first reflects developments in the white rather than black sector of the market. Although vacancy rates in predominantly black type 3 tracts rose by about the same amount in each decade, rates in predominantly white type 1 tracts increased between 1950 and 1960, and then remained stable throughout the 1960s. Presumably, this stability in the white sectors of the city stems from the decline in the rate of white out-migration from areas not adjacent to the ghetto—from 10 percent in the 1950s to 5 percent in the 1960s—and may reflect changes in the birth rate, in the rate of family formation, or in a variety of other demographic and socioeconomic factors that affect the locational decisions of households. Whatever its source, it may have created a situation whereby housing in the white sectors of the city became scarce, and thus more expensive relative to housing in black and in integrated areas. This seemingly exogenous development in the white submarket could conceivably account for part, if not all, of the observed decline in the relative price of ghetto housing, even without a fundamental change in the way in which housing was supplied to blacks.

A second trend, however, points to possible shifts within the black sectors of the market, and in particular, indicates a change in the speed at which housing was made available to blacks. Although quality improvements were continual, data in Tables 4-5 and 4-6 imply an increase in the rate of ghetto expansion during the 1960s, evidenced by an increase in the speed of racial transition in border areas.

The population trends in Table 4-5 suggest that there was a fairly large increase during the 1960s in the rate at which blacks entered previously white or border neighborhoods and an accompanying rise in the rate at which whites evacuated those areas. These aggregate trends probably reflect a more rapid integration and resegregation of border tracts. In the first decade, the average concentration of blacks in incorporated tracts increased by a factor of five; and in the second decade, by a factor of ten. Indeed, during the 1960s, seven times as many whites as blacks lived in tracts that experienced substantial racial transition, where "substantial transition" is defined as an increase of 3 percent or more in the fraction black in a neighborhood.

Several factors might explain this apparent shift in the rate of ghetto expansion. One possible source is the general loosening of the central-city market between 1950 and 1960, a development that presumably reflects the rapid rate of white suburbanization, especially through migration from tracts near the ghetto border. During the 1950s, the black sector incorporated tracts whose average vacancy rate was under 1 percent; this unusually tight market may have hindered racial transition by reducing the opportunity costs of overt discriminatory behavior. By 1960, vacancy rates within the central city had increased to an average of 3 percent. This general weakening of the market may have undermined private and institutional resistance to integration, and may have facilitated black entry into previously all-white neighborhoods.

A second factor that might explain the apparent acceleration of ghetto expansion is the initiation of legislative reforms that were designed to ameliorate institutionalized discrimination in housing. If effective, such legislation would increase the ability of blacks to bid against whites in predominantly white neighborhoods and would encourage the initial integration of previously segregated tracts. In the absence of pronounced shifts in the racial attitudes of households, such legislation would probably not promote racial balance in neighborhoods, but instead would simply accelerate the black sector's rate of peripheral expansion.

Finally, the increased rate of racial transition might also reflect systematic differences in the characteristics of border neighborhoods at the beginning of the two decades. If, for example, some housing were particularly suited to the needs of the black community, it could be incorporated with little or no modification. On the other hand, if housing in the immediate path of expansion were particularly inappropriate, expansion would involve a significant degree of conversion or leapfrogging, and would become both cumbersome and

expensive. Characteristics of the border residents—particularly socioeconomic status and ethnicity—can also affect the speed of racial transition, given that different groups have different attitudes toward race and toward the overall desirability of their neighborhoods. Thus, it is possible that in 1960, conditions in border neighborhoods were more amenable to expansion than they were in the previous decade, and that as a result, transition occurred at a somewhat faster rate.

Although our data do not enable us to accept or reject this hypothesis, a comparison of type 2 neighborhoods in 1950 and 1960 does not reveal any strong evidence of an effect of this sort. From a relative standpoint, there was no significant difference in border neighborhoods between the two years. The concentration of various ethnic groups remained about the same, and although incomes and the overall quality of the stock increased between 1950 and 1960, they did not appear to increase relative to the average quality and income levels within the predominantly black sectors of the market. As a result, we suspect that this third factor had relatively little impact on the overall rate of neighborhood transition, and that the other sources noted above were the principal vehicles of the apparent change.

Thus, while the various trends described in this section result in a somewhat fragmentary image of the growth and composition of Boston's black housing market, and while the source of many of these developments is far from clear, the market data are generally consistent with our hypothesis that the observed reduction in the relative price of ghetto housing stemmed from an alleviation of the excess demand for quality housing in predominantly black areas. That same data suggest several possible reasons for this response. The first is an accelerated rate of ghetto expansion, due perhaps to the legislative reforms of the 1960s or to the generalized increase in vacancy rates between 1950 and 1960. The second possible reason is associated not so much with developments in the black sectors of the market, but rather with the decreased rate of white out-migration from white neighborhoods located beyond the path of ghetto expansion. This change accentuated differences in vacancy rates between white and black neighborhoods, and may have created a relative housing shortage in the predominantly white sectors of the city.

### **Pittsburgh**

In Pittsburgh during the 1960s, the total population showed no growth and the black population very little. In Boston, by contrast, the white population showed little growth, but the black population

grew very rapidly. Thus, in Pittsburgh the only source of increased demand for housing was through increases in real income. The demand from this source resulted in the construction of 109,000 new units during the 1960s, or about 14 percent of the 1970 housing stock. These units were predominantly owner-occupied and suburban, the latter being in part due to major highway improvements. The accompanying movement of white households from the central city (Table 4-3), where the majority of blacks lived, should have greatly increased the availability of housing to the latter. Indeed, a potentially substantial abandonment problem in the city was offset in two ways: First, the combination of an aggressive urban renewal program coupled with private actions resulted in the demolition of approximately 7 percent of the 1960 central-city stock; and second, an increase in household formation during the decade produced a decline in average household size in the city from 3.21 to 2.92 persons.

An important distinction between Boston and Pittsburgh is in the pattern of black residential location. In Boston, as noted, black residences were generally in contiguous census tracts located overwhelmingly in the central city. In Pittsburgh, by contrast, there were four main black residential areas in 1970 with several additional, smaller concentrations. Only two of the four, which include about 70 percent of the black population, are exclusively in the central city.<sup>7</sup> Our analysis is restricted to the four principal areas.

Also unlike Boston, the extent of racial transition of neighborhoods was really quite modest during the 1960s. We used a classification scheme similar to one used for the Boston analysis: Each of the four main black residential areas included in our analysis tracts is classified as being either in the core enclave, in the area of racial transition around the core, or in a ring of essentially white tracts around the second group.<sup>8</sup> As in the Boston analysis, the neighborhood types are coded 3, 2, and 1. The main pattern from 1950 through 1970 was for the black population to displace the white population in those areas in which blacks as of 1950 amounted to at least a measurable share of the population. This pattern is reflected in the entries in the first row of Table 4-7, which shows the fraction of population accounted for by blacks in each neighborhood type for the three census years; the black fraction of the population in the predominantly black neighborhood (type 3) rose steadily from 0.52 to 0.72. In all four residential areas during the 1950s, the number of census tracts with populations 30 percent or more black doubled (from 16 to 32); during the 1960s only nine more shifted, and these were spread over three of the four residential areas.<sup>9</sup> Hence

**Table 4-7. Housing and Demographic Trends in Pittsburgh, by Tract Type, 1950-1970**

	1950 <sup>a</sup>			1960			1970		
	Type 1	Type 2	Type 3	Type 1	Type 2	Type 3	Type 1	Type 2	Type 3
Percent population black	2	12	52	2	13	61	2	13	72
Percent units vacant	2	2	1	4	4	4	6	06	9
Percent units owner-occupied	39	44	30	49	43	46	48	43	38
Percent units in single-unit structures	35	46	32	52	53	50	47	46	49
Percent units in structures with 5 or more units	18	11	20	20	16	19	26	24	24
Percent units with Complete plumbing <sup>b</sup>	60	54	44	87	83	80	93	90	92
Central heat	65	61	55	81	72	60	85	84	76
1-3 rooms	NA	NA	NA	29	32	34	30	30	26
7 or more rooms	NA	NA	NA	15	11	11	14	12	13
Percent units in sound condition <sup>c</sup>	NA	NA	NA	.82	.70	.63	NA	NA	NA
Mean income (thous. dol.) <sup>d</sup>	3.22	3.07	2.32	7.54	5.84	4.82	11.85	9.30	7.64
Percent households living in dwelling									
2 years or less	NA	NA	NA	27	25	29	28	30	26
2-5 Years	NA	NA	NA	25	29	28	32	30	39
Over 5 years	NA	NA	NA	48	51	44	40	39	36

NA = not available.

<sup>a</sup>Tracts included in 1950 differ slightly from those for 1960 and 1970 due to noncomparability of tract boundaries.

<sup>b</sup>Includes piped hot and cold water and exclusive use of toilet and tub or shower.

<sup>c</sup>Not available for 1950 and 1970.

<sup>d</sup>For 1950, income of families and unrelated individuals; for 1960 and 1970, income of families.

the number of "transitional tracts" out of the 130 included in the analysis was quite small during the 1960s.

The explanation for the decrease in housing premiums paid by blacks in Pittsburgh, documented earlier, would seem logically to lie in the supply of housing available to blacks—both the number of units and their quality. The factors leading to higher rates of housing availability have already been noted, and the net effect of these factors is evident in the vacancy rates shown in Table 4-6. The Pittsburgh area went from an extremely tight market in 1950 to a fairly loose one by 1970. Similar to the Boston experience, in the predominantly black neighborhoods the pattern was accentuated by

the high (9 percent) vacancy rates in 1970; unlike Boston, fairly high rates were also present in the type 1 neighborhoods. The overall softness in the market, of course, increases the choice not only of blacks but also of whites, making it easier for the latter to move away from blacks if they so choose. Likewise, higher vacancy rates impose additional costs on landlords, as well as on owner-occupants selling their homes who prefer not to deal with blacks, especially in those areas where blacks represent a sizable portion of the population.

An important question, though, concerns the quality of housing made available during the 1960s through the suburbanization of white households. This is especially critical because the real income of the black families rose by 28 percent from 1960 to 1970. (In Boston the increase was less than half this amount.) Data included in Table 4-7 provide some information on this point. In terms of the crude indications afforded by the fraction of units with complete plumbing facilities and central heat, there has been a massive improvement in basic dwelling unit quality since 1950; in 1970, for example, 92 percent of the units in the predominantly black neighborhood had full plumbing compared with 44 percent in 1950.<sup>10</sup> By 1970 the dwellings in the type 3 neighborhoods were remarkably similar in a number of characteristics to units in "all-white" (type 1) neighborhoods.

It has already been noted that the amount of housing made available to blacks through the expansion of predominantly black neighborhoods into all-white tracts was relatively unimportant. It is nevertheless of interest to contrast the "quality" of housing made available in this way with that already found in predominantly black neighborhoods. The data in Table 4-8 contrast the 1960 characteristics of nontransitional tracts (designated 1:1, 2:2, and 3:3) with tracts in transition (designated 1:2 and 2:3) over the decade. An examination of the data reveals no clear pattern; and on balance we conclude that the stock in the transitional and nontransitional areas was roughly similar. The more general conclusion following from this and several prior statements is that much of the improvement in the stock of housing in predominantly black neighborhoods over the decade involved upgrading of part of the existing stock and demolition of some of the worst stock through urban renewal.

To amplify this last point somewhat, it could be argued that the very tight market conditions of the 1950s, which could have made price and other types of discrimination against blacks fairly inexpensive to those so discriminating, produced the premiums blacks paid in 1960. During the 1960s the softer market conditions helped to

**Table 4-8. Comparison of 1960 Characteristics of Nontransitional Tracts in Pittsburgh with Tracts in Transition during 1960-1970 (fractions of units having the stated characteristic)**

	<i>Type of Tract<sup>a</sup></i>					
	<i>1:1</i>	<i>1:2</i>	<i>2:2</i>	<i>2:3</i>	<i>3:3<sup>b</sup></i>	<i>3:3+<sup>c</sup></i>
Vacant	.04	.05	.05	.02	.04	.04
Owner-occupied	.50	.44	.46	.45	.36	.36
In 1-unit structures	.52	.49	.55	.61	.49	.51
In units in structures of 5 or more units	.20	.20	.16	.16	.19	.23
With complete plumbing	.88	.85	.83	.90	.80	.85
With central heat	.81	.82	.78	.77	.59	.69
In sound condition	.82	.84	.72	.70	.63	.68
With 1-3 rooms	.29	.30	.30	.26	.33	.29
With 7 or more rooms	.15	.14	.12	.14	.13	.12

<sup>a</sup>Nontransitional tracts are designated 1:1, 2:2, and 3:3; the others are transitional. The numbers 1, 2, and 3 refer to the neighborhood types as defined earlier.

<sup>b</sup>All tracts in type 3 neighborhoods in 1960.

<sup>c</sup>In tracts designated 3+, the black fraction of the population increased by 0.20 during 1960-1970.

dissipate the premiums; nevertheless, prices had to remain high enough to induce improvements black households sought to have made in the available stock. The higher demand was a product of rising real incomes combined with the higher social housing standards generally evident in the postwar era. The long response time of housing suppliers to the high prices is consistent with the fragmentary evidence on the price elasticity of supply of existing units (de Leeuw and Ekanem 1971; Ozanne and Struyk 1976; and de Leeuw and Struyk 1975, Chap. 5). In transitional neighborhoods, where housing suppliers' uncertainty is greater, even slower response would be likely. The primary importance of the improvement of the stock already largely occupied by black households seems to be worth emphasizing, since its role in alleviating pressure at the boundary of the black neighborhood has received very little attention in prior analyses. The marked reduction of housing premiums to blacks in Pittsburgh, then, seems to be attributable to a decrease in the competition for central-city and near-suburban housing stock caused by the outmovement of white households and to the response of housing suppliers in predominantly black neighborhoods to the demand by blacks for higher-quality units.

## SUMMARY AND CONCLUSIONS

In this analysis we used data from the 1960 and 1970 census of Population and Housing to estimate the relative price of ghetto housing in Boston and Pittsburgh in each of the two sample years. For the decade considered, the experiences of the two cities were remarkably alike. In Pittsburgh, the markups in all-black tracts dropped from 20 percent in 1960 to 7 percent in 1970, while in Boston a 12 percent premium was replaced by a 5 percent ghetto discount.

Although the estimated differentials in price could be explained by a number of factors, we hypothesized that in both cities the 1960 markups reflected a shortage of quality housing in predominantly black neighborhoods and that the subsequent reduction of the markups stemmed from an alleviation of that initial excess demand. In the remainder of the study, we examined twenty-year trends in the characteristics of census tracts in both Boston and Pittsburgh to determine if market developments were consistent with our basic supply hypothesis. We also explored alternative sources of the hypothesized supply response.

In Boston, the overall price decline was consistent with a deceleration in the rate of white evacuation from white neighborhoods not adjacent to the ghetto, and with certain other developments that occurred within the black and border sectors of the central-city housing market. Since the growth in black demand was fairly constant between 1950 and 1970, the decline in the relative price of ghetto housing during the 1960s suggests a distinct shift in supply. Although the qualitative nature of the supply response was essentially the same in each decade—rising vacancy rates in predominantly black neighborhoods accompanied by significant increases in the overall quality of housing—its quantitative nature did appear to change, reflecting an acceleration in the rate of ghetto expansion. This change could be attributed to a variety of factors, including increased vacancy rates at the beginning of the decade and open housing reforms of the late 1960s.

Pittsburgh exhibited many of these same general patterns. In each decade, there was a fairly substantial rise in the overall quality of housing in predominantly black tracts; and these gains were once again accompanied by rising vacancy rates within the ghetto. In Pittsburgh, however, the increase in black demand between 1960 and 1970 was probably modest, given the relative stability of the black population. As a result, the observed price decline could simply

reflect movements along a relatively stable supply curve for housing, rather than shifts in the way or in the rate at which units were supplied to blacks.

The similarities between the experiences of our two cities, despite their widely different patterns of demand, suggest possible declines in the relative price of ghetto housing in other metropolitan areas. Again, since many factors could affect the relative price of ghetto housing, different cities could easily display a noticeably different pattern. Nevertheless, our analysis does illustrate the need to reassess the evidence of the early 1960s in light of recent market developments which might facilitate the ability of the black sector to adjust to an excess demand for housing. In the end, the question is essentially an empirical one, and definitive answers await the arrival of similar analyses applied to a fairly large number of housing markets.

#### APPENDIX 4A

**Table 4A-1. Stage I Boston Regressions,<sup>a</sup> 1960 and 1970 (figures in parentheses are *t* ratios)**

<i>Independent Variables</i>	<i>Regression for In Value</i>		<i>Regression for In Rent</i>	
	1970	1960	1970	1960
Structural variables	.36	.46	.30	.29
In rooms <sup>b</sup>	(16.20)	(21.89)	(23.49)	(24.82)
Central heat <sup>c</sup>	.07	.34	.09	.23
(yes=1)	(2.17)	(11.34)	(5.72)	(21.23)
Units in structure				
Duplex		.11	-.09	-.02
(yes=1)	d	(3.35)	(3.84)	(1.12)
Three or more		.21	-.11	-.04
(yes=1)	d	(5.42)	(4.97)	(2.75)
Central air conditioning	.10	e	.32	e
(yes=1)	(2.24)		(9.43)	
Sound condition	d	.26	d	.06
(yes=1)		(11.08)		(5.28)
Basement	.09	.11	.06	.03
(yes=1)	(3.91)	(4.24)	(3.15)	(1.17)
Number of bathrooms				
One and one-half	.16	e	.14	3
(yes=1)	(12.38)		(4.70)	
Two or more	.32	e	.25	e
(yes=1)	(19.40)		(7.39)	

Table 4A-1 (cont.)

Independent Variables	Regression for In Rent		Regression for In Rent	
	1970	1960	1970	1960
More than one (yes=1)	-	.30 (23.27)	-	.27 (8.80)
Age of structure				
Built 1960-1970 (yes=1)	.21 (12.44)	-	.18 (10.52)	-
Built 1950-1959 (yes=1)	.17 (11.63)	.28 (18.60)	-.13 (6.77)	-.07 (3.60)
Built 1940-1949 (yes=1)	.11 (6.15)	.20 (10.26)	-.06 (3.42)	-.11 (4.92)
Complete plumbing <sup>f</sup> (yes=1)	.18 (2.94)	.21 (4.95)	.25 (10.58)	.23 (16.19)
Household Variables				
Crowding				
Less than 0.5 persons per room (yes=1)	.01 (0.32)	.04 (3.55)	-.06 (6.16)	-.06 (6.41)
More than one person per room (yes=1)	-.07 (2.87)	-.06 (2.33)	-	-.02 (0.95)
Length of residence				
7-20 years (yes=1)	-.07 (5.52)	-.04 (3.08)	-.14 (12.05)	-.08 (8.07)
Over 20 years (yes=1)	-.11 (6.67)	-.08 (4.81)	-.18 (9.92)	-.10 (6.94)
Neighborhood variables				
Accessibility				
Central city location (yes=1)	-.13 (6.01)	-.17 (13.81)	.05 (3.77)	-.08 (8.47)
Proportion of units in single-family structure	-.08 (2.33)	g	-.12 (3.90)	g
Proportion of units in struc- tures with 5 or more units	.01 (0.18)	g	.10 (3.09)	g
Demographic variables				
Average neighborhood income (thous. dol.)	.01 (1.83)	g	.01 (1.54)	g
Proportion high status <sup>h</sup>	.07 (0.60)	g	.19 (2.52)	g
Proportion black	-.04 (2.01)	g	.08 (1.91)	g
Black household head (yes=1)	-.04 (0.54)	-	.02 (0.64)	-
White household head (yes=1)	-	.12 (2.15)	-	.02 (1.04)
Proportion Puerto Rican	-.98 (2.15)	g	-.09 (0.37)	g

Table 4A-1 (cont.)

Independent Variables	Regression for In Rent		Regression for In Rent	
	1970	1960	1970	1960
Puerto Rican household head (yes=1)	.08 (0.67)	—	.01 (0.09)	—
Proportion high-valued units <sup>i</sup>	.54 (8.95)	—	.57 (11.65)	—
Proportion vacant units	-2.06 (5.13)	g	-.78 (3.90)	g
Constant	8.67 (102.9)	7.58 (93.42)	3.96 (87.16)	3.57 (93.57)
<i>F</i>	179.87	208.75	140.80	189.97
<i>R</i> <sup>2</sup>	.57	.44	.48	.40
Number of observations	3,364	4,284	3,985	4,651

<sup>a</sup>The 1960 sample includes all SMSAs in Massachusetts; the 1970 sample includes the Boston urbanized area. The housing unit values are from the Census Bureau, which lists reported values in intervals that range from \$0-\$5,000 to \$50,000 or more. Units were assigned values equal to the midpoint of these intervals except that units in the \$0-\$5,000 range were assigned the value of \$3,500 and units in the \$50,000 or over range were assigned values of \$60,000. This procedure corresponds to that used by the Census for calculating average values of housing units.

"Rent" refers to gross monthly rent, which equals the contract rent of the unit plus the value of all utilities purchased by the tenant. For 1970, gross rent data are continuous.

<sup>b</sup>A value of 12 was assigned to units classified as having nine or more rooms.

<sup>c</sup>Includes steam or hot water or a central warm air furnace of a built-in electric unit.

<sup>d</sup>All owner-occupied units were one-unit structures.

<sup>e</sup>Data not included in public use sample.

<sup>f</sup>Includes each of the following: piped hot and cold water inside the structure, a flush toilet, and a bathtub or shower inside the structure which is used only by the occupants of that structure.

<sup>g</sup>Neighborhood data are available only from the 1970 Neighborhood Public Use Sample for the New England Census Division.

<sup>h</sup>This is a composite variable that measures the occupation and education of households residing in the unit's neighborhood:  $X = 0.5 (O + E)$ , where  $O$  = proportion of workers who are professional, technical, and kindred workers, and managers and administrators except farm; and  $E$  = proportion of persons 25-54 years old with four or more years of college.

<sup>i</sup>Weighted average of the proportion of units with above-average values and gross rents:  $X = p_0(HV) + p_r(HR)$ , where  $HV$  is the proportion of owner-occupied units with values of \$25,000 or more;  $HR$  is the proportion of renter-occupied units with gross rents of \$150 or more; and  $p_0$  and  $p_r$  are the proportions of the neighborhood's dwelling units that are owner-occupied and rented, respectively.

Table 4A-2. Stage I Pittsburgh Regressions,<sup>a</sup> 1960 and 1970 (t statistics in parentheses)

Independent Variables <sup>b</sup>	Regression for In Rent		Regression for In Value	
	1960	1970	1960	1970
Constant	3.15 (145)	3.46 (57.8)	7.67 (282)	7.24 (69.6)
In rooms	.241 (27.4)	-	.423 (32.8)	.837 (16.6)
No. of rooms	-	.106 (14.3)	-	-
Private toilet (yes=1)	.136 (8.52)	-	-	-
Hot water (yes=1)	.232 (12.3)	-	-	-
Complete plumbing (yes=1)	-	.184 (5.25)	.283 (16.8)	-
Basement (yes=1)	.145 (10.8)	.122 (4.16)	.152 (11.6)	-
Central heat (yes=1)	.108 (10.6)	.251 (10.2)	.284 (23.6)	.443 (7.62)
Sound condition (yes=1)	.072 (7.46)	c	.219 (17.2)	c
Built 1960-1970 (yes=1)	-	.188 (5.90)	-	.587 (19.1)
Built 1950-1959 (yes=1)	.272 (15.7)	.176 (5.76)	.508 (53.3)	.577 (24.5)
Built 1940-1949 (yes=1)	.097 (6.44)	.070 (2.68)	.345 (30.8)	.418 (13.5)
1-unit structure (yes=1)	-	-.329 (10.8)	-	d
2-unit structure (yes=1)	.029 (2.54)	-.307 (10.3)	.278 (8.34)	d
3-4-unit structure (yes=1)	.011 (.90)	-.203 (6.69)	.309 (6.00)	d
5-9-unit structure (yes=1)	.024 (1.62)	-.147 (4.82)	.292 (3.96)	d
10+ unit structure (yes=1)	.224 (14.0)	-	-.094 (.75)	d
Number of bathrooms				
More than 1 (yes=1)	.244 (13.0)	-	.376 (43.4)	-
One and one-half (yes=1)	e	.175 (4.39)	e	.154 (6.51)

Table 4A-2 (cont.)

Independent Variables <sup>b</sup>	Regression for In Rent		Regression for In Value	
	1960	1970	1960	1970
2 (yes=1)	e	.125 (2.54)	e	.218 (6.47)
Over 2 (yes=1)	e	.255 (2.66)	e	.557 (14.3)
Window air conditioner (yes=1)	e	.256 (10.5)	e	.112 (4.43)
Central air conditioner (yes=1)	e	.557 (13.4)	e	.221 (5.14)
Moved in 1968-1970 (yes=1)	-	.221 (5.85)	-	-
Moved in 1965-1967 (yes=1)	-	.083 (2.11)	-	-
Moved in 1960-1964 (yes=1)	-	.098 (2.39)	-	-
Moved in 1955-1960 (yes=1)	.119 (12.9)	-	.072 (6.71)	-
Moved in 1940-1954 (yes=1)	.060 (5.89)	-	.057 (6.42)	-
Children per room	-	-	-.091 (8.04)	-
Black household head (yes=1)	-.025 (1.15)	-.116 (4.86)	-.108 (6.43)	-.175 (3.65)
Nonwhite household head (yes=1)	-	.161 (1.49)	-	-
Central city location (yes=1)	.035 (4.26)	c	-.090 (11.5)	c
Unrelated person present (yes=1)	.064 (3.09)	-	-	-
$\bar{R}^2$	.328	.554	.478	.493
F	205	90.4	873	235

<sup>a</sup>The 1960 sample includes all SMSAs in Pennsylvania; the 1970 sample includes Allegheny and Westmoreland Counties. Housing unit values and rent are the same as for Table 4A-1 (see note a).

<sup>b</sup>In rooms, plumbing, and central heat are defined as in Table 4A-1.

<sup>c</sup>Data not available.

<sup>d</sup>All owner-occupied units were one-unit structures.

<sup>e</sup>Data not included in the public use sample.

**Table 4A-3. Stage II Boston Regressions, 1960 and 1970** (*t* statistics in parentheses; dependent variable is  $(1n R_i - 1n \hat{R}_i)$ , the difference between the average log of rent for the tract and the predicted average  $1n$  rent, where rents are average of gross rents and housing values)

<i>Independent Variables</i>	<i>1960</i>	<i>1970</i>
$1n$ (distance) <sup>a</sup>	.0223 (2.089)	-.0515 (3.649)
Tax rate <sup>b</sup>	.0014 (3.980)	.0015 (4.574)
(Tax rate) × (proportion owner-occupied)	-.0053 (10.54)	-.0041 (9.463)
Per pupil school expenditures (hund. dol.)	.0048 (0.755)	.0206 (7.025)
Average family income (thous. dol.)	.0444 (18.27)	.0153 (10.40)
Proportion low status <sup>c</sup>	-.9257 (12.24)	-1.434 (12.39)
Proportion other nonwhite	.6745 (6.710)	.2210 (-.904)
Proportion black	-.1166 (1.490)	-.0488 (1.471)
(Proportion black) <sup>2</sup>	.2392 (2.280)	-
Proportion Italian <sup>d</sup>	.2032 (5.568)	.3347 (4.914)
Proportion Puerto Rican <sup>d</sup>	.0716 (0.076)	.2006 (1.032)
Proportion vacant	-.3564 (1.916)	-1.017 (4.396)
Proportion public housing	-.3176 (10.08)	-.2704 (5.274)
Proportion of land devoted to commercial activity	-.1176 (1.476)	-
Proportion of land devoted to manufacturing	-.5963 (3.862)	-
Air pollution <sup>e</sup>	-	-2.116 (4.097)
Constant	-.1176 (2.971)	.0612 (1.154)
$R^2$	.87	.79
$F$	194.95	137.9
No. of observations	436	478

<sup>a</sup>"Distance" is a weighted variable defined as:

Table 4A-3 (cont.)

$$\ln(\text{distance}_i) = \ln(a_1 x_{1i} + a_2 x_{2i} + \dots + a_5 x_{5i})$$

where  $x_{it}$  is the straight-line distance between the tract and the  $i$ th employment center, and  $a_1$  is the proportion of total SMSA manufacturing, wholesale, retail, and service employment contained in that center. Five employment centers were selected: Boston, Cambridge, Lynn, Quincy, and Waltham.

<sup>b</sup>The tax rate is the equalized (or full-valued) rate, obtained by multiplying the nominal rate by the municipality's average assessment-sales ratio.

<sup>c</sup>The socioeconomic status of the tract was measured by the following variable:  $s = 0.5 \times (E + L)$ , where  $E$  is the proportion of the tract's residents over twenty-five years of age who have not attended high school, and  $L$  is the proportion of male workers over fourteen years of age who are classified as laborers.

<sup>d</sup>"Italian" ("Puerto Rican") refers to individuals who were born in Italy (Puerto Rico) or whose parents were born in Italy (Puerto Rico).

<sup>e</sup>The air pollution variable measures the concentration of particulates in milligrams per cubic meter.

**Table 4A-4. Stage II Pittsburgh Regressions, 1960 and 1970 (*t* statistics in parentheses; dependent variable is  $\ln R_i - \ln \bar{R}_i$ , as for Table 4A-3)**

<i>Independent Variables</i>	1960	1970
Proportion population black	.219 (4.02)	-.344 (4.16)
(Proportion population black) <sup>2</sup>	-	.416 (4.57)
Proportion population Italian-born	.232 (1.83)	.346 (2.96)
Proportion population German-born	.963 (3.82)	.725 (2.43)
Proportion population first- or second-generation American	1.186 (3.13)	.507 (4.58)
Proportion population foreign-born	.163 (2.04)	-
Mean family income (thous. dol.)	.039 (8.30)	-
Mean income, families and unrelated individuals (thous. dol.)	-	.023 (7.23)
Proportion population over age 25 with 8 years or fewer of school	-.493 (6.20)	-.223 (3.18)
Time to CBD by bus	-	-.003 (3.04)
(Time to CBD by bus) <sup>2</sup>	-	.00002 (2.88)
Average travel time to work	.172 <sup>a</sup> (3.13)	.0004 (2.07)

Table 4A-4 (cont.)

<i>Independent Variables</i>	1960	1970
Percent of land undeveloped	.179 (4.96)	-.028 (.60)
Percent of land in residential land use		.021 (.53)
Property tax rate		.0031 (4.07)
(Property tax rate) × (proportion of units owner-occupied)		-.0036 (6.03)
Total per capita expenditures in jurisdiction (× 100)	.001 (1.88)	
Head tax rate		.005 (.52)
Earnings tax rate in jurisdiction	-.019 (1.31)	
Capital school expenditures per student		.0001 (2.82)
Proportion of units vacant	.618 (1.67)	.152 (.35)
Proportion of population in non-institutional group quarters		.800 (5.84)
Proportion of population in institutions		.169 (1.27)
Proportion owner-occupied units in condominiums		-.885 (10.6)
Constant	-.633 (3.38)	-.126 (1.19)
$\bar{R}^2$	.604	.568
F	61.2	27.0

<sup>a</sup>Variable is the log of average travel time.

## NOTES TO CHAPTER FOUR

1. Detailed analyses of the effects of group preferences on racial premiums have been done by Bailey (1959), Muth (1974), Pascal (1969), and Schnare (1976).

2. This is the usual form of a so-called hedonic index; for a full discussion of its properties, see Rosen (1974) and Griliches (1971).

3. Schnare (1976) provides details on this test, as well as on the overall econometric procedure.

4. The complete set of Stage I and Stage II parameters is presented in the appendix to this paper.

5. The nonrace variables included in these models are discussed in Schnare (1976).

6. The definition of type 3 neighborhoods for Boston and Pittsburgh was based on the observed pattern of neighborhood racial tipping; i.e., once a tract's proportion black reached about 20 percent, there was a large increase in the probability that its proportion black would increase significantly by the end of the decade.

7. The neighborhoods encompassed by each of the four areas are Manchester-Northside, Hill District-the Strip, East Liberty-Homewood-Brushton-Wilkenburg, and Rankin-Braddock. The third area is partially outside Pittsburgh City, and the fourth is completely outside.

8. The definitions of these areas in terms of percent of the population that is black are: type 1, 1-10 percent; type 2, 11-30 percent; type 3, over 30 percent. These definitions were selected after studying racial patterns over the two decades. For a more detailed discussion of racial transition in Pittsburgh see Darden (1973).

9. "Tracts" here refer either to individual tracts or to groups of two or three that were considered together in order to match the tract boundaries. In this regard it might be noted that sets of tracts included in the 1950-1960 and 1960-1970 analyses are not identical. The two sets differ by a few tracts because of problems of matching tract boundaries while retaining racial homogeneity, i.e., we did not want to join together tracts belonging to differing neighborhood types.

10. For a longer historical perspective on housing conditions in Pittsburgh see Lubove (1969).

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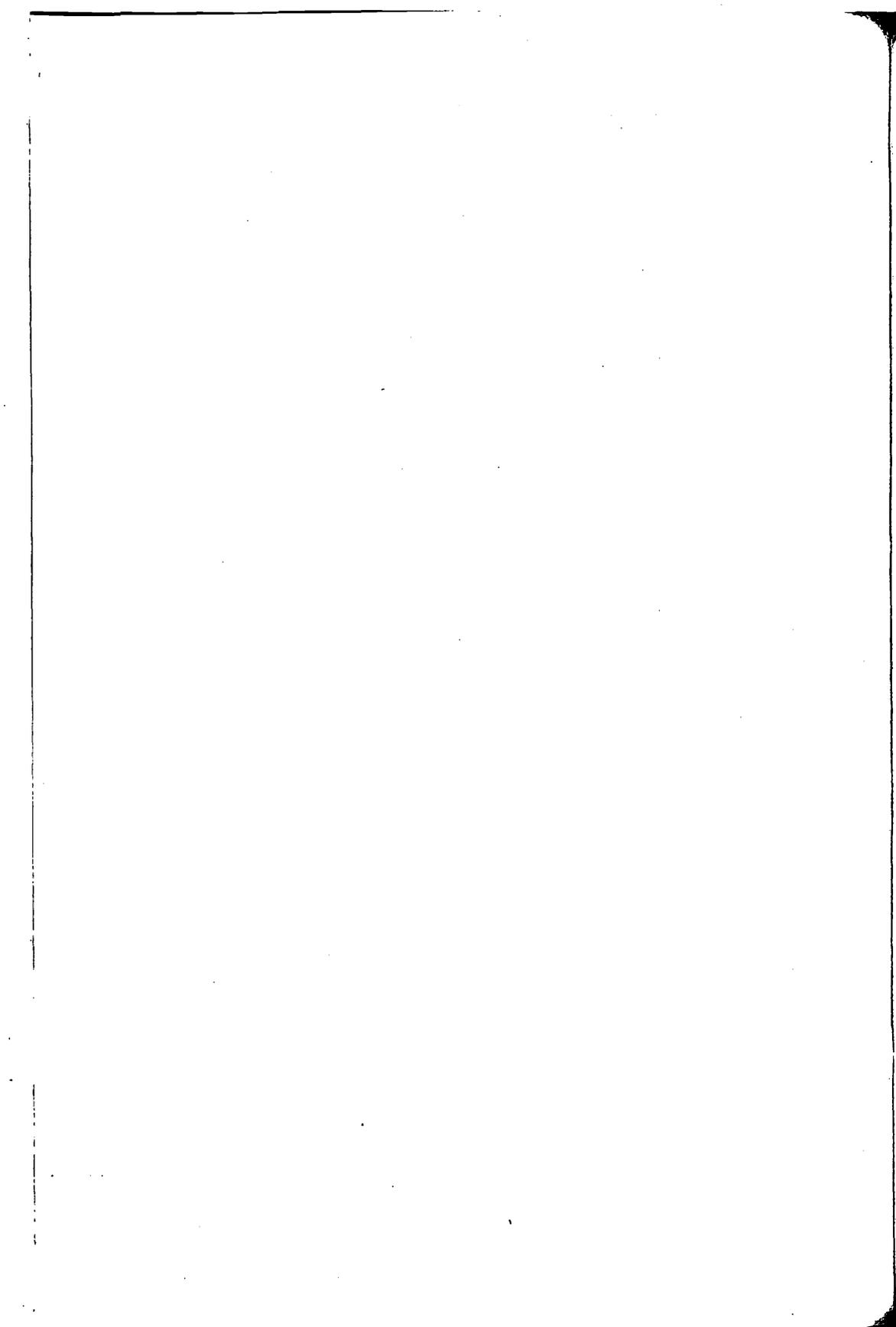
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## Comments on Chapter Four

Peter Mieszkowski

This is a very carefully done study. I can find little to criticize or disagree with. The authors are very well acquainted with the literature and with the difficulties associated with isolating and interpreting the relationship between rent levels and the racial composition of neighborhoods. One could quibble about the quality of the census data at their disposal, but this hardly seems appropriate, as Schnare and Struyk have used the data with care and imagination.

The basic quantitative proposition put forth is that various estimates of rent premiums (discounts) paid by black minority group members may be quite specific to the time and place of measurement. Using census data, Schnare and Struyk estimate rent relations for 1960 and 1970 for Boston and Pittsburgh and find that in both cities the rent differentials paid by blacks have declined significantly. In Boston, the 1960 differentials were U-shaped: minimum rents were found in areas that were 25 percent black; in the all-black ghetto, rents were some 12 percent higher than in all-white zones. In 1970 these premiums disappeared. Prices declined steadily as the concentration of blacks in a tract rose, with ghetto rents at least 5 percent lower than rents in the white interior.

In Pittsburgh in 1960 rents rose steadily with black concentration, reaching a maximum premium of 20 percent in all-black areas. In 1970 the relationship was U-shaped, with tracts that were 40 percent black having rents 7 percent lower than all-white tracts, while in 100 percent black tracts there was a 7 percent premium relative to all-white tracts.

As a result of their examination of population growth and movements within each of the two SMSAs, Schnare and Struyk in essence attribute the change in racial price differentials between 1960 and 1970 to the following factors: Rapid suburbanization in both Boston and Pittsburgh was accompanied by a rapid expansion of black areas into transitional neighborhoods in both central cities. In Boston, whites moved to the suburbs and became further concentrated in all-white areas in central-city Boston. In Pittsburgh, the rate of growth of the white and black populations was more modest, and rapid construction in the suburbs led to an increase in both the quality and quantity of housing available to blacks in the central city. In Pittsburgh, the vacancy rate in all central-city neighborhoods rose during the 1960s, reflecting general market weakness in that city. Similarly, in central-city Boston the vacancy rate rose in black neighborhoods.

The reasons for the more rapid neighborhood transition are not altogether clear. In Pittsburgh, slow population growth and new construction seem to explain the general softness in the central-city submarket. In Boston, where the population growth of whites and blacks was more rapid, the explanations of changes in black-white price differentials seem to depend on suburbanization and the movement of whites out of transitional, racially integrated neighborhoods. The authors several times mention institutional changes, most notably the inactment of the open-housing laws in the late 1960s, but it is doubtful whether these formal changes could have had much of an impact by the time of the 1970 census.

The analysis presented by Schnare-Struyk seems to confirm the housing models of Bailey and Muth, who placed stress on the market incentives for racially transforming neighborhoods in decentralized housing markets and on the aversion of whites to living in racially integrated neighborhoods and sharing integrated public facilities such as schools. As the white population has continued to decline in many central cities and whites appear to be isolating themselves in suburban communities, it is very likely that similar results will be obtained in other cities.

Some observers, myself included, will be skeptical that this study and others like it have fully controlled for neighborhood quality, and they may explain the lower housing prices in black neighborhoods in terms of low-quality schools, high crime rates, and so forth. Yet it is easier to raise the point on neighborhood quality than to control for it, and it does not really go against the main point made in this study: relative to whites, black Americans are now paying less for housing than they have in the past.

The regression results and the more informal analysis presented in the paper strongly suggest that the housing choices available to blacks have improved during the decade of the 1960s. What we do not know, however, is what restrictions remain and how severe they are. I believe that it is important to note the limitations of the analysis of racially determined rental differentials:

First, there always is some ambiguity of interpretation. Any differential measured at a given moment in time may be the outcome of a transitional shortrun shock that will soon work itself out. As noted, an estimated differential will rarely be net of neighborhood effects; also, it will rarely be net of household characteristics or "tenant quality." It *may* be that a typical black tenant will be less attractive than a typical white tenant because of economic status and characteristics of behavior (real or imagined) that bear on production costs.

Second, differentials do not get at the costs of market segregation and restrictions on the choice of housing bundle that an unregulated market mechanism may impose on black members of the population.

Finally, the estimated rent differentials have only a general, indirect bearing on housing market policies.

It seems to me that from the viewpoint of policy discussion and social action, the marginal benefits of further work on rent differentials may be quite low. More promising is the possibility of extending and formalizing the use of the audit approach to the investigation of racial discrimination in housing markets. In this approach, which is used by various social action groups in the United States, attempts are made to determine, by direct observation and market experience, the differential treatment of minority group members relative to whites by rental agents, real estate brokers, and so forth. Such an experiment, if carefully designed, could in principle provide useful information concerning the effects on the probability of "success" (getting an apartment, say) of such varied household characteristics as race, income status, occupation, family structure, education, appearance, as well as the effects of differences in the type of landlord, the neighborhood, and so forth.

Such an approach would isolate the effects of race and could have a direct bearing on the more effective enforcement of open-housing laws. The audit does not indicate how discrimination translates itself into price differentials, but it has become increasingly evident that rent differentials are only one (albeit the most important) of the dimensions of discrimination and segregation. Restrictions on access to various neighborhoods, types of housing, and better-quality schools may also be very important to increasingly more affluent minority group members.

