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AN ESTIMATE OF RACIAL DISCRIMINATION IN RENTAL HOUSING

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AN ESTIMATE OF RACIAL DISCRIMINATION IN RENTAL HOUSING[*]

by

Thomas King and Peter Mieszkowski

This paper investigates the existence and magnitude of price dis-
crimination by race in the New Haven rental housing market. Specifically,
the purpose is to determine whether, and by how much, blacks pay more than
whites do for equivalent housing. Such an inquiry needs no lengthy
justification. If price discrimination exists, then a substantial segment
of our population with relatively low money incomes receives even lower
real incomes because the value of their dollars spent on housing is syste-
matically reduced. Evidence of a substantial amount of price discrimination
would imply the need for specific housing programs to improve the quantity
and quality of housing consumption by blacks. Income maintenance programs
alone would be insufficient, because the housing problems of blacks would
not be due solely to low incomes. If justification of this
study is necessary, it is because many observers believe that the existence

of price discrimination is well established; they might concede at most the need to determine the magnitude of such discrimination. Surprisingly, however, neither the existence nor the size of price discrimination has been well documented.

The belief to the contrary is probably explained by a confusion of segregation and price discrimination. It is obvious to most persons that housing in America is highly segregated, and the exclusion of Negroes from many neighborhoods and towns through a variety of means is well known. That the patterns of segregation in housing markets are not natural, in the sense that they cannot be explained by the relatively low incomes of blacks or other socio-economic differences between blacks and whites, has been demonstrated in the work of the Taeubers (1965) and A.H. Pascal (1967). Many people seem to conclude from these facts that housing is available on different money terms to blacks than to whites. Since price discrimination by race is not easily observed in a systematic fashion, the implicit assumption made must be that the existence of segregation by race is sufficient to ensure price discrimination by race.

In the first section of this paper, we review a number of models of discrimination, and conclude that since there may be little, if any, relationship between segregation and price discrimination by race, the existence of price discrimination has to be established empirically. The second section reviews existing estimates of price discrimination in housing for the U.S. In the third section, we present quantitative estimates of price discrimination in the New Haven rental market. These estimates are based on a survey that was designed to improve on the imperfect data that have hindered previous work on discrimination.

I. Models of Discrimination and Segregation

We believe it to be self evident that the basic cause of segregation is racial prejudice on the part of whites. There are many degrees of prejudice ranging from extreme dislike to uneasy tolerance, but they all produce a taste for segregation, which we define as a preference by whites for living among other whites rather than among blacks. However, the taste for segregation will not automatically result in a segregated housing market; as several earlier studies have recognized (Bailey (1959), Muth (1969)), whether the markets will be segregated or not will depend on the relative strength of the white taste for segregation compared to the black taste for integration.

Assume for the moment that the white taste for segregation is sufficiently strong that a completely segregated housing market is created. Even in this situation the effect of segregation on housing costs for blacks is far from obvious. To see this ambiguity, imagine that the housing market is divided by a river and that all whites live on the left bank and all blacks on the right bank. If there is competition in the provision of housing   if   the cost of providing housing for blacks is the same as it is for whites, and if new construction is possible on both banks, then housing prices would be expected to be the same throughout the city. This model is not very representative of reality because black and white neighborhoods are rarely separated so sharply and Negroes rarely obtain their housing through new construction. Nevertheless, it makes an important point: the existence of segregation tells us little about the relative price of housing to blacks. What determines this in our model is the

elasticity of housing supply. A secondary point is that the price differential between the two housing submarkets is not necessarily indicative of the white taste for segregation.

The sharply segregated residential areas of this model preclude the estimation of what amount, if any, whites must pay to obtain their segregation from blacks. Since no blacks live in white neighborhoods, two quite different explanations for the segregation cannot be distinguished empirically on the basis of the rents paid. It is possible that whites are adverse to living close to blacks and are able to exclude blacks by actually, or potentially, imposing severe economic losses on landlords or other real estate agents who might provide blacks with housing in all-white neighborhoods. Alternatively, it could be that blacks rarely seek housing in all-white areas because the premium they would be willing to pay to live there is small or even negative.

In reality "rivers" do not always divide separate black and white neighborhoods, and at least some whites live in close proximity to blacks at the border of the black ghetto. On the basis of some highly suggestive work of Martin Bailey (1959), relative rents at the black-white boundary and the white interior can serve as a basis for estimating the magnitude of the taste for segregation of whites. Bailey postulates that whites are adverse to living close to blacks and are willing to pay a premium for living in all-white areas. This premium will, up to some point, be positively related to the distance of a housing unit from black areas. If blacks have no taste for segregation or integration, the price of housing should be the same throughout the black ghetto.

Bailey argues that, in the long run, the price of black housing,
relative to white housing, at the black-white boundary will depend on whether
the housing stock at the boundary is owned by many or by few persons. The
need for this distinction arises because in his model the conversion of a
white block into a black block causes the rents on nearby white blocks to
fall. Under divided ownership, the full effects of changing the location
of the black-white boundary will be partially or fully ignored and black
prices will tend to be equal to white prices at the boundary. Because of
the white taste for segregation, white prices in the white interior must
be higher than white boundary prices, and the overall price of white housing
will exceed that of black housing. Thus, whites will pay for their prejudice
(taste for segregation) and landlords in the white interior will gain a
windfall.

On the other hand, if the whole housing stock os owned by a single
landlord, or if there is collusive behavior among landlords, housing rents
for the market as a whole will be maximized when the black price, which is
the same at the black-white boundary and the interior of the black area,
is equal to the price of housing in the white interior. To see this, con-
sider the simple case where there are three blocks, W (white interior),
B (boundary), and G (black interior). Assume in this example that there
is no change in the total number of black and white households to be housed
and that blacks are like whites in all ways except skin color. When prices
are equal at W and G, but lower in the boundary block, the gain from
converting the boundary block B from white to black residents will be
offset by the loss of the segregation premium previously paid by residents

of the white block, W . Furthermore, the increased rent in the white housing
area caused by the decreased supply of housing will be offset by the lower
rents in the black area caused by the increased supply there. Thus, there
will be no advantage to the conversion and an equilibrium will be maintained
with white interior rents equal to black interior rents. But if initially
the price in the black interior had exceeded the price in the white interior,
the net gain[1] from converting the boundary block into a black interior block
will be the difference between the price at G and the price at B minus
the difference between the price at W and the price at B ; that is,
$(P_G - P_B) - (P_W - P_B)$. This gain is clearly equal to the difference between
the prices in the two interior areas, $(P_G - P_W)$. Therefore, conversion
will continue until the decrease in the supply of white housing and the
increase in the supply of black housing cause the rents in the two interior
areas to become equal. Only then will there be no advantage to further
conversions.

The result on the equality of rents in the interior areas is inde-
pendent of the preferences of blacks. If blacks are adverse (prefer) to
residing (reside) in integrated areas rents paid by blacks will be lower
(higher) at the boundary, but under co-ordinated ownership rents in the
interior areas will tend towards equality. Under divided ownership a pre-
ference on the part of blacks for housing in black areas will increase ghetto
prices relative to prices at the boundary.

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[1]Ignoring the effect on P_G and P_W of changed supply relative to demand
in these two submarkets.

This model is quite suggestive in a number of respects. It explains why the black ghettos expand at their boundaries, since white demand will be weak in these areas, and it also explains landlords' reluctance to rent to blacks even when a substantial rent differential exists in a particular segment of the housing market. The Bailey model also has several important implications for quantitative studies of racial price differentials. First, it suggests that in long-run equilibrium the price differential for blacks will be negative or zero, depending on whether the market is competitive or collusive. Second, it suggests that the black-white rent differential will vary within a given housing market. In order to determine this differential in an empirical study, the sample must be drawn to include observations from all racial sections of the housing market, and variables should be included to reflect the proximity of a particular observation to the black-white boundary.

The possibility raised by the Bailey model that blacks obtain housing on the same money terms as whites or that whites as a group pay more for housing is likely to be widely rejected, as it goes against conventional wisdom. Kain (1969) appears to have little use for models based on individual sellers' taste for segregation, and stresses collusive behavior and a high level of market organization with realtors, lenders, and other market agents excluding blacks from white areas, "penning" them in ghettos, and effectively extracting a premium or discrimination markup for them. According to Kain, the ghetto will expand only if the price in the black submarket exceeds the price in the white submarket by more than the markup.

Actually, the collusive behavior suggested by Kain is not necessarily

inconsistent with the model of centralized ownership discussed by Bailey, in which the full market effects of transforming white into black housing are accounted for. Blacks are not shown units in the white interior because this would depress housing values there. Realtors who depend on continuing sales and goodwill in a neighborhood may discourage an individual seller or landlord who wishes to deal with blacks. Realtors transform white housing into black housing on an orderly block-by-block basis in order to preserve the white market nearby. Even in a world of divided ownership of properties, agents in the real estate industry supply, to some extent, the requisites of the centralized model by attempting to maximize overall real estate values.

Although it is possible to rationalize collusive behavior in terms of Bailey's model, we would like to suggest one possible distinction between the Bailey formulation and the collusive model of discrimination. Bailey's work suggests that in equilibrium the prices in the white interior will be either higher than or equal to those in the black interior, whereas the spirit of the collusive model seems to be the opposite. While this distinction is valid only in the long run, the important point is that Bailey's model expects the markup to cause its own elimination, whereas the collusive model does not. Of course the difference between the two models is a difference in quantitative prediction. Black-white rent differentials of 1% would be interpreted as virtual equalization in rents. There will be a clear-cut conflict between the two models only when the rent differential is very small, or is quite substantial.

To this point we have been careful to limit our analysis to the long-run equilibrium effects of whites' taste for segregation on the relative

housing prices to whites and blacks. These we regard as the pure effects of racial discrimination. But however interesting this analysis, it is clearly incomplete. The short-run dynamic effects of segregation, which the model ignores, may well be the most important, especially at the present time.

In recent years large-scale immigration of blacks to urban areas has greatly expanded the demand for units to house blacks. In New Haven, for example, the 1967 Special Census revealed an increase in the non-white population of 48.4 percent between 1960 and 1967.[2] At the same time urban renewal programs have demolished many of the poor quality units where low income blacks formerly lived. The effect of these changes has been to increase greatly the number of blacks seeking dwelling units. Racial segregation, which has restricted black demand primarily to the areas reserved for blacks, has largely insulated the white market from this change in total demand and funnelled it into a small submarket. This, of course, tends to raise the price of black housing relative to white.

The equilibrium models presented at the beginning of this section imply that price differentials of this sort will not persist indefinitely; expansion of the housing supply available for black occupancy will eventually lower, eliminate, and even reverse the price differential. But the rate at which this occurs will depend on the elasticity of the housing supply

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[2] U.S. Bureau of the Census, Current Population Reports, Series P-28, No. 1459, "Special Census of the New Haven SMSA, April 5, 1967," U.S. Government Printing Office, Washington, D.C., 1967.

function for black units. In the actual urban housing markets, most of the increased demand for black housing units must be met by conversion of white units. The white taste for segregation and the various measures taken to gratify it imply that the elasticity of supply from conversion is probably not high. Therefore, price differentials may be both large and persistent.[3]

Our expectations about these points imply that we should be cautious in applying the Bailey model to present day housing markets. We cannot expect to find the overall pattern of rents in black and white areas that he postulates will exist in long-run equilibrium. Nevertheless, it remains true even in the short run that if whites have a taste for segregation, white boundary prices should be lower than white interior prices. Evidence of this would serve as weak confirmation of the Bailey model; at a minimum, it suggests the existence of the long-run adjustment mechanism which Bailey's model requires: low white demand and prices in boundary areas lead to expansion of the black area with a concomitant decrease in rents as supply expands relative to demand.

Large-scale black immigration to urban areas has a second consequence for observed racial price differentials, one quite distinct from that which may be attributed to segregation and low elasticity of supply from conversions. We refer here to the difficulties which any new group experiences in dislodging the existing population from its housing and inducing new construction.

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[3]The proposition that the black-white rent differential is a _temporary_ phenomenon that is due to the influx of blacks into central cities was first suggested by Gary Becker (1957) and has been repeated by Richard Muth (1969). Empirical support for the rate of growth hypothesis has recently been presented by Hangen and Heins (1969) who found that for a cross-section of cities, black-white median rent differentials increased with the rate of growth of the black population.

Immigrants, whatever their race, will tend to pay more than established residents for housing of comparable quality because they compete with one another for housing that becomes vacant, are less familiar with the market, and have yet to establish themselves as satisfactory tenants. Particularly, in times of general change in the price level, one must note that housing markets do not adjust instantaneously or perfectly so that each unit of housing of the same quality class will always rent at the same price. There are lags in market adjustments: leases must expire, movers must find new housing, and so on.[4]

These considerations imply that efforts to isolate the permanent or semi-permanent rent differentials which result from racial discrimination must attempt to control for the relatively poor information of immigrants and the lags in housing market adjustments. Since blacks will tend, on the average, to be more recent immigrants than whites, failure to control for these information and market adjustment effects will erroneously inflate any estimate of racial price discrimination.

Another general class of difficulties in interpreting black-white rent differentials is the possibility that these reflect differences in the cost of providing housing to blacks, which result from their larger family size, the greater uncertainty of rent payments because of low, fluc-

[4] In her analysis of housing-income relationships, Margaret Reid (1962) placed special emphasis on market information and the fact that immigrants are poorly informed about housing conditions in the local market.

tuating incomes, and the higher incidence of families headed by females.[5]
The relatively weak economic position of blacks is itself largely a result
of generations of discrimination. However, for purposes of policy formation
it is important to understand what proportion of higher rents is due to
higher costs and what to the existence of segregation.

Although the possibility of higher costs of production are sometimes
mentioned in the literature, there has been no previous attempt to quantify
these costs. This would be very difficult and would require detailed re-
cords on maintenance and repair, with controls of the age and condition of
the various units at the time the tenants moved into them. A much less
ambitious control for the varying costs of production for different families
would be information on the socio-economic characteristics of these families.
Data on family size would allow one to test the proposition that larger
families pay more rent because of their more intensive use of housing. The
education level of the head might be a proxy for the class status of a family.
In addition to the possibility that these variables might be related to varying
costs of production, socio-economic information permits tests for discrimination
on grounds other than race. It is important to attempt to sort out racial
discrimination from other price differentials that may be correlated with race.

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[5]Data contained in Orshansky (1968) indicate that on the basis of the income
standards set by the Social Security Administration, 15 percent of white
households and 40 percent of non-white households were classified as poor
in 1966. About 20 percent of white households but 30 percent of non-white
households were headed by a female. Of female-headed households, 38 per-
cent of white but 61 percent of non-white were poor. The differences in
family size are not as striking: 17 percent of white and 23 percent of
black households had three or more children.

In concluding this section, we would like to emphasize that estimates of the premium blacks may have to pay for housing of comparable quality are a lower bound of the cost of segregation to blacks. Exclusion from many neighborhoods reserved for whites forces blacks to live in areas containing higher rates of crime, poorer public services, and in many instances a generally lower quality of life related to high density residential development. Segregation in central cities can deny blacks easy access to jobs, especially those in the outlying parts of the metropolitan areas. If, in general, housing is inferior in all-black neighborhoods, middle-class blacks will find it very difficult, if not impossible, to buy the type of housing that would be commensurate with their incomes and tastes. The loss in welfare from the restrictions on the type of housing they can buy may be far more important than the premium (relative to comparable housing in poorer white neighborhoods) they may be paying for moderate quality housing in all-black neighborhoods.

II. Review of Previous Studies

As might be expected, the limitations of available data have generally prevented studies of racial price discrimination from making the careful distinctions we have advocated in the previous section. A principal difficulty in many cases has been inadequate control for the quality of the housing unit. Much of the work has been based on census data which are aggregated over census tracts or cities. In these studies the only controls possible for dwelling unit quality are the percentage of units which are substandard and the median number of rooms per unit, but these controls

are too few and too imprecise for this task. One notes, for example, the difficulty in reaching a definition of "substandard." Not surprisingly, the Census Bureau has found (1964) that different enumerators have different notions of what constitutes substandard housing. Definitional uncertainties also make intertemporal comparisons difficult: it has been estimated that there was a serious undercount of substandard housing in 1960 relative to 1950 because in 1960 the enumerators came from relatively lower income levels. Conclusions drawn from studies which have had to rely on inadequate data are often open to numerous objections. In this section we describe the methods and results of a few of these studies.

Chester Rapkin (1966) tabulated for whites and blacks in 1960, by various rent brackets, the percentage of renter-occupied housing units which were substandard. Rapkin found that for each rent bracket, say $50-79 per month, the percentage of substandard white units (29.3) was significantly less than the percentage of substandard black units (44.5). Rapkin also presents similar tabulations for various regions of the country. These regional tabulations had some control for the number of rooms in the unit, but the rent classes were so broad (less than $50 per month, $50-79, and $80 and over) that there is a distinct possibility that a large part of the difference in the higher proportion of substandard units occupied by blacks by each rent bracket may be due to quality differences. Especially in the upper, open-ended bracket, whites are likely to avoid substandard housing by paying more. Exactly the same sort of difficulty arises in a Bureau of Labor Statistics survey (1966) which is reported in Olsen (1969). This survey shows that in the same rent range the quality of housing occupied

by richer families is superior to the quality of housing occupied by relatively poor families. In this case also, it is highly likely that within each rent range richer people will buy better quality housing and pay more for it. Thus, inferences about price discrimination against blacks or the poor which might be drawn from these two studies would be poorly justified.

More systematic use of census data have been made by Ridker and Henning (1967), Muth (1969), and Whiry (1969). In their study of property values by census tract for St. Louis, Ridker and Henning found a positive relationship between the value of owner-occupied homes and the percentage non-white in the tract. They controlled for air pollution, rooms per unit, age of units, and accessibility for the central business district. Their results indicate that as a census tract increases from zero percent non-white to 100 percent non-white the median value for owner-occupied homes increased by $2,600, which represents a discrimination markup of 20 percent.

Muth's work on the population densities for the South side of Chicago also uses census data; Muth converts home value to monthly expenditure and then combines rental housing and owner-occupied homes. Muth assumes that each physical dwelling unit, e.g., a single apartment, can be described as containing a fixed number of quality standardized units of housing. Monthly housing expenditure per household, is, therefore, equal to the price per unit of housing, standardized for quality, multiplied by the number of units of housing contained in the particular dwelling. Thus, if dwelling units are identical or quality and quantity differences controlled for, higher household expenditures by Negroes can be used as evidence of discrimination against blacks, or as evidence of higher costs of providing housing to blacks.

Although the explanatory variables Muth uses differ from those of Ridker and Henning, he too finds that housing expenditures for households in all-black census tracts are significantly higher than in all-white tracts. Muth's results (p. 239) imply that if dwelling units are of standard quality, there is a 30 percent discrimination markup against blacks. Although Muth uses locational variables and such quality variables as the percentage of units which are substandard and the average age of the units, he does not interpret his results as though the quality of the units were controlled for and does not take his results as evidence of discrimination. In effect, this implies that census data, or at least the equations he fits, cannot be used to estimate the extent of discrimination against blacks because they do not isolate the price differential of a quality-adjusted unit of housing.

Muth buttresses his position with two subsidiary pieces of information. First, he emphasizes the findings of previous studies that the price elasticity of demand for housing services is -1 or larger (in absolute value). If this finding is correct and applicable to blacks, then total expenditures on housing, controlling for differences in income, would be the same as or less than expenditures by whites even if blacks were charged higher prices for housing of comparable quality. For this reason he prefers to regard the higher expenditures as indicative of other factors, probably additional costs of supplying housing to Negroes. He suggests that rental units occupied by Negroes may more often include payment for furniture and utilities in the rent, but offers no evidence to support this supposition.

His second piece of information is the result of his study of several physical measures of housing consumption. He examines, for example, the

population per unit of residential land, the proportion of units with more than one person per room, and the proportion of dwelling units which are one-family structures. For 1960 only by the third of these measures does he find evidence of statistically significant greater crowding in Negro areas, as would be expected if Negroes do indeed pay more for housing of comparable quality. By the other measures in 1960, and by all in 1950, he finds evidence of slight, and statistically insignificant, crowding in black areas.

One possible explanation for this finding of no greater crowding might be the undercounting of residents in black ghetto areas, the extent of which Jacob Siegel has estimated in a recent paper (1968). He calculated that in 1950 only 88.5 percent of the true non-white population was counted in the census. In 1960 the proportion improved slightly to 90.5 percent. This undercounting might explain the failure to observe in black census tracts the expected higher population density per unit of residential land and the expected greater proportion of rooms with more than one occupant. In this respect it appears significant that the one measure of physical consumption which did indicate crowding in black areas, namely, the proportion of one-family dwelling units, is the only one which would not have been affected by the undercount of population.

Whiry (1969), like Ridker and Henning, interprets rents and housing values, as reported in the census, as being prices of housing that can be adjusted for quality differences by variables such as the age of the units and the median number of rooms in a census tract. Whiry's results for Syracuse imply very high levels of discrimination against Negroes with estimated

housing prices being about 100 percent higher in all-black census tracts
than in all-white census tracts. These results are not very plausible. Nor
are they credible;   estimated values of key parameters are highly sensitive
to changes in specification and the coefficients of variables that are supposed to control
for quality either have the wrong sign or are statistically insignificant.

In contrast to census data where only a few summary statistics are
reported for a city or a census tract, detailed data on about 1500 individual
dwelling units were collected in connection with the St. Louis Community
Renewal Program (1968). These data have been utilized by Kain and Quigley
(1970) in regressions to study the determinants of housing value and rents.
For this study experts made quality evaluations of the unit, the structure,
and the neighborhood. The various dimensions of quality were then compressed
by factor analysis to composite indices of quality. In addition to these
quality indices, their regressions included information on the dimensions
of the dwelling unit, the age of structure, the lot size, and various neigh-
borhood variables. For rental units information on what was included in
rent was also utilized. Kain and Quigley did not use the race of the occupants
of individual housing units, but used instead the racial composition of the
census tract in which the unit was located. For both the renter market and
the owner market, they found that an increase in the percentage black in
the tract increased rents and the cost of owner-occupied housing. For the
regressions where only city (St. Louis) data were used, a comparable unit
in an all-white area was estimated to cost $4.20 per month less than one
located in an all-black area, an amount equal to 8 percent of average Negro
rent. A single-family house was $700 or 5 percent cheaper in an all-white

neighborhood than in an all-black area. Unfortunately, some of these esti-
mates were subject to high sampling error; the t value for the percent
non-white for the renter market was about 1.5 and for the owner market,
about .5. Consequently, one cannot reject the no discrimination hypothesis,
especially for the owner market, with any degree of certainty. Nevertheless,
these estimates are interesting on two counts: first, they are based on
data which allow very good controls on the quality of the units; and second,
although the estimated cost of discrimination is not insignificant in size,
it is probably more modest than is generally presumed.

A study which finds that Negroes do not pay more for housing of com-
parable quality is that by Martin Bailey (1966) of owner-occupied homes
in South Chicago. Bailey used public records to establish transactions
prices for a sample of about one hundred sales, and controlled for the size
of the house and lot size. His main objective was to test the proposition
developed in his previous article (1959) that the aversion of whites to
living in proximity to blacks would depress the price of housing at the
white-black boundary. His results support this proposition, as an increase
in the proportion of blacks decreases the value of properties in surrounding
blocks. The absence of a racial effect on housing prices in the immediate
neighborhood (the own-block effect) suggests that single-family dwellings
in the interior of the ghetto do not sell for more than comparable houses
in all-white neighborhoods. However, as Muth (p. 302) has noted, his findings
may be questioned because the houses studied were located near the University
of Chicago, where proximity to the University may have been more highly
valued by whites than by blacks.

III. Discrimination in the New Haven Rental Market

During the fall of 1968 and early winter of 1969, we surveyed about
220 rental units in New Haven, Connecticut. The data generated by this survey
are used to fit regressions of the form:

$$Rent = aQ + bN + cH .$$

The dependent variable is monthly rent inclusive of utilities. Q is a
vector of variables that describe the unit in terms of its size, quality,
and other physical characteristics; N , a vector of neighborhood variables
such as location and racial composition; and H , a vector of household
characteristics such as race, family size, and the education of the head
of the household.

The equation is a reduced form with both demand and supply factors
entering as explanatory variables. One characterization of the rent setting
process is based on the existence of a fixed stock of units with a variety
of different features; renters bid for these units, and the larger, higher
quality units in desirable neighborhoods will rent for more than smaller,
inferior units. When landlords are indifferent to tenant groups, rents
will be determined primarily by the preferences of the renters. Of course,
in long-run equilibrium, the present value of rentals on extras such as
furniture, appliances, etc. should be equal to their reproduction costs.

If the stock and quality of housing units is fixed changes in demand
resulting from changes in the demographic characteristics of the population
and in the level of income would change the values of the size and quality
parameters. On the other hand if the price of a new unit is constant, and

if it was possible to quickly transform units of one type into another, the difference in the rents of units of varying quality would reflect differences in maintenance expenditures. In this case changes in demand would not change the size and quality dimensions of the rent structure, but would lead to changes in the relative quantities of units of various types. As the truth lies somewhere in between these two extreme assumptions about the nature of supply, the variables which control for the features of the dwelling units cannot be given a definite supply interpretation.

Fortunately this ambiguity does not compromise our basic objective which is to determine whether black pay more for housing as the result of racial discrimination. However, the question whether production costs are higher for blacks cannot be definitely settled by means of our relatively small sample. The uncertainty of rent payments and other considerations related to the lower economic status of blacks cannot be controlled by the income of the household or the education of the head of household. Educational attainment, correlated with income, will be positively correlated with the quality of the dwelling unit and this relation will offset the lower rent that might result from the higher economic status. Another difficulty arises from the fact that the survey was conducted after the tenants had occupied their units for some time. Consequently, it is possible that the poor quality of a unit may be due, in part, to poor housekeeping habits of the tenants.

Preliminary regressions indicated a problem of heteroscedasticity related to the area of the apartment. In order to reduce this, we have divided the dependent variable, rent per month, and all explanatory variables by the area. In the original model the values of some features such as room

quality and furniture are postulated to be proportional to area; however, the values of other features such as the quality of the plumbing and kitchen appliances would appear to be not related to area. The equations in Table A are given, and the variables named, as they appear after having been divided by area. To relate these equations to the original model, all terms must be multiplied by area. For example, the term labeled "Intercept" is actually the coefficient of "Area" in the original equation; and "1/Area" is the true intercept. The "R" reported for each equation is for the homoscedastic equation estimated rather than for the original model.

In our attempt to measure the amount of racial price discrimination, we introduced racial, household, and locational variables in a number of different forms. The control variables for the characteristics of the units and the neighborhoods are common to these different specifications, and as the estimates of the contribution of these variables to rental values are quite insensitive to changes in the specification of racial factors, we begin with a discussion of their effects.

A representative rental regression is equation 1 in Table A, in which most of the explanatory variables have the expected signs and are statistically significant. The mean rent in the sample is $17.30 per 100 sq. ft. of living space, and the average unit size is 750 sq. ft. In regression 1, the coefficient for the race dummy is $1.91 per 100 sq. ft. Hence, on the average, blacks pay $\frac{1.91}{17.30}$ = 11% more than whites, _ceteris parabus_. Also, for a comparable unit, a household headed by a woman pays $\frac{.99}{17.30}$ = 5.7% more than a household headed by a man. A household defined to be uninformed (had resided in the city less than two years prior to renting) pays $\frac{1.28}{17.30}$ = 7.4%

more than a household that was informed. A furnished apartment of average size costs, exclusive of appliances, about $10 more a month than an unfurnished unit. Basic appliances, a stove and refrigerator, together cost about $9.50 extra a month. Additional appliances such as air-conditioning cost $10 a month extra. As relatively few units in the sample provide non-basic appliances, the higher estimate for the cost of these appliances probably reflects other quality dimensions of the unit.

The quality of the plumbing fixtures and the average quality of the rooms (the condition of walls, floors, and ceilings) both have the expected sign and the former is higher significant, statistically. Although the dimensions (units of measurement) of these two quality variables are not comparable,[6] the results indicate that plumbing fixtures are important in rent determination. Higher quality modern bathroom and kitchen fixtures will raise rents by as much as 25 percent relative to units with small, old-fashioned, poorly functioning plumbing fixtures. On the other hand, it does not appear that renters place much value on well kept floors and clean walls and ceilings. Other quality dimensions which are statistically significant are the number of electrical outlets and the presence of a thermostat. Holding area constant, we find that an increase by one in the number of outlets per room will increase rent by 4 percent and that the absence of a thermostat lowers rent by 6 percent.[7]

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[6] The quality indices are discussed in the data appendix.

[7] This value seems high and as higher quality units usually have thermostats, this probably reflects quality dimensions other than the control of heat.

Two important control variables are the date at which the current rent was set and the number of persons occupying the unit. The first is important because blacks are likely to be recent arrivals in a particular city; in searching for better housing they are likely to move more often and, as a consequence, to pay rents which reflect current market conditions. The second is important because landlords may regard the number of persons per hundred square feet as an indication of the damage which will be done during the tenant's occupancy. Because of lower incomes and larger family size, blacks are likely to buy less floor space per person, and therefore to pay more for the apartment than would a smaller, richer white family. Unless family size is controlled for, a racial variable will reflect any higher cost due to crowding of providing housing for poor blacks, in addition to any effect of racial price discrimination.

Our results indicate that both variables are significant: rents which were set 36 months before the survey were about ten percent less than rents set in the month of the survey. For an average-sized apartment, if the number of persons per hundred square feet is doubled from the mean value of .45 to .90 rents increase by about six percent. These results indicate that low-income families may in part pay higher rents because they are forced to conserve on living space. And for blacks, they imply that racial discrimination may have a compound effect: first, it will raise the monthly rents; and second, because rents are higher, blacks may choose to purchase fewer square feet per person and would consequently incur extra costs due

to crowding.[8]

One variable which did not perform according to expectations is the least variable. We expected, other things being equal, that a lease would lower rents since it provides the landlord security and formalizes various tenant responsibilities. However, in our sample, rents on units with leases were 11 percent higher. This finding may be due to the positive correlations between lease and room quality and lease and distance from the center of New Haven (the simple correlation is about .4 in each case). In general the higher quality neighborhoods are located on the outer rings of the city. Consequently, the lease variable may represent in part the higher quality features of the unit and of the neighborhood in which the unit is located.

Distance from the New Haven Green was estimated to have no effect on rents. Although the influences of distance may be masked because of the positive correlation between distance and quality of neighborhoods, the relatively small area of the city of New Haven decreases the possibility of isolating the expected negative effects of distance.

Two neighborhood quality variables were developed. The number of structural fires in the census tract in which the unit is located was chosen on the presumption that this variable is highly correlated with blight, crime, and the average quality of housing in the neighborhood. The main difficulty

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[8]In an equation not reported here we used an alternative measure of crowding, Persons/Area (number of persons in the family in the original model). The estimates of crowding costs in this specification were somewhat higher: doubling family size raised rents by about 11 percent. We prefer the specification Persons/Area^2, as this implies that the change in rent resulting from a one person increase in family size will be larger for small than for large apartments.

with this variable is that it is readily available only on a census tract
basis, an area which may be too large to represent a neighborhood. The
other neighborhood characterization was the interviewer's subjective evalua-
tion of the external neighborhood quality of the block face and surrounding
blocks on a scale of 1 to 5. The evaluator considered traffic, street litter,
and the external condition of the housing units in making this index. In
preliminary regressions, the contribution was small, statistically insig-
nificant, and had the wrong sign, i.e., rents were inversely related to
neighborhood quality. The rather insignificant effects of these neighbor-
hood variables are probably more indicative of the difficulty of isolating
neighborhood effects than of their lack of influence on rents. In the absence
of a large, varied sample that would allow neighborhood quality to be iden-
tified, our estimates of racial discrimination are likely to be biased down-
wards as blacks are concentrated in less desirable neighborhoods.

The conclusion from regression 1 that black households pay more than
white households for housing of comparable quality stands up for a variety
of specifications of race. In regression 2, we added a census variable,
percentage of non-whites on the block, to the unit's specific racial dummy.
The result indicates that a black family residing in the ghetto will pay
$\frac{.98 + .023*(100)}{17.30}$ = 19% more than a white family living in an all-white
neighborhood. This result is virtually the same in the regression (not
reported) where percentage of blacks on the block replaces the racial dummy.
In this case, it was estimated that rents are 18 percent higher in all-black
neighborhoods than in all-white neighborhoods.

In regression 3, we test the proposition that households headed by black women will pay significantly more for housing than do households headed by black men, white men, or white women. In addition, we control for the possibility that households receiving welfare will be charged a higher rent. The higher rents for welfare families are a combination of discrimination against these families and imperfections in the housing market that allow landlords to charge more on the expectation that the welfare department will not search out the cheapest possible housing for their clients.

In this regression (no. 3), four dummy variables are used to determine the rents of different households relative to rents paid by families headed by white males. The results are quite striking. Households headed by white females pay virtually the same rent paid by white males. Households headed by black males pay 7.2 percent more relative to households headed by white males, whereas black female-headed households pay 17 percent more. Welfare families are estimated to pay an additional 6.2 percent; however, the welfare dummy is not statistically significant.

These results should be interpreted with some care. Of the 25 households in our sample which are headed by a black woman, 16 are on welfare, and in 75 percent of all blacks, female-headed households, children were present. Of the 25 households headed by white women, only one was on welfare and in only 5 households were small children present. It is somewhat doubtful, therefore, that the discrimination against black women has been completely isolated from the rent premium charged to a welfare department which may not minimize rent payments. Further, because of very different family structures for black female-headed households and white female-headed households,

we cannot say what proportion of the large rent premium paid by black women should be attributed to racial discrimination and what proportion represents discrimination against female-headed families with small children. We can conclude that white female-headed families, many of them elderly, are not discriminated against vis-a-vis households headed by a white male. It is possible to speculate that the difference between rents paid by black male-headed households and black female-headed households (about 10 percent) is a result of discrimination against the female-headed household with small children, and that this premium would be paid by similar white-female-headed households.

In Section I of this paper we described the model of housing segregation developed by Martin Bailey. This predicts that under collusive market behavior or centralized ownership rents in long-run equilibrium will be equalized between ghetto areas and white interior areas and that rents paid by whites in partially integrated areas will be lower than rents elsewhere. We noted then that the New Haven housing market is not in long-run equilibrium, but that it might nevertheless be instructive to examine the pattern of rents in boundary and interior areas. We do this in regressions 4 and 5, the difference between these being how finely we distinguish among various racial areas.

The results for the two specifications are quite similar. Ghetto prices are systematically higher for both blacks and whites (five white households in our sample reside in the ghetto), with black and white households both paying 11 percent more in the ghetto (in addition to the discrimination against black females) than do whites in all-white neighborhoods.

The estimates of the rent premium paid by blacks and whites in boundary areas and by blacks in the white interior are much less reliable, statistically. In regression 5, black households residing in the black boundary pay about 6.5 percent more than whites residing in the white interior; whites residing in the white boundary pay about 4 percent less, as predicted by the Bailey model. Neither of these estimates is statistically different from zero, using the appropriate one-tailed t-test at the ten percent level of significance; however, each has the correct sign. One possible explanation for the insignificance of the boundary variables is the relatively few observations on some: only fourteen black households reside in the white boundary and white interior and only fourteen white households reside in the black boundary and ghetto. Finally, there is no evidence that black households residing in the white boundary or white interior pay higher rents than do white households residing in all-white neighborhoods. This result must be accepted cautiously, however, as the non-monetary costs of obtaining this housing may have been substantial.

Of course, one must be careful in drawing conclusions from the results of regressions 4 and 5. Nevertheless, some things do seem apparent. As we suggested in Section I, price differentials between blacks and whites do differ in the various sections of the housing market. In our sample the blacks and whites in the ghetto both pay the same rent, which is much higher than in the white interior. Blacks in the black boundary pay more than whites, but both pay less than in the ghetto; while in the white boundary, blacks pay more than whites, but not more than whites in the interior. Finally, in the white interior blacks and whites again pay the same.

One might be tempted to explain the differences in rents paid by black households in different areas as resulting from differences in family structure, social class, or income. Our particular sample, however, provides no support for this conjecture. The household size and the number of children per household of black households residing in black neighborhoods (ghetto and black boundary) are virtually the same as those of black households residing in white areas (white interior and white boundary). There are no striking differences between the education of the head of the household and the incomes of households residing in the two areas,[9] and the proportion of households headed by females was virtually the same. The only significant difference was that one-third of the black households residing in black areas received welfare, whereas only one-seventh of those in white areas did.[10]

In order to test the proposition that characteristics of the family other than its size and the sex of its head influence the rental paid for equivalent units, we added the educational attainment of the head of the household to regression 3. Before discussing the results in detail, we remark that the estimated coefficient for education is difficult to interpret. The level of education of the head may be expected to influence the rents paid by a household through both the supply and the demand functions. As

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[9]Heads of households in black neighborhoods have completed on the average 9.6 years of education and mean household income was $6,600. The education level of black households residing in white neighborhoods was 10 years and the mean household income was $7,000.

[10]To guard against the possibility that the higher rents in black neighborhoods are due in part to the concentration of welfare recipients in these areas we added the welfare dummy to regression 5. The results reported as regression 6 are virtually the same as 5.

a supply variable the tenant's education may be valued by the landlord for its own sake and as an indication of the class of the tenant and the damage he might do to the unit. Furthermore, in an imperfect housing market the tenant's education may serve as a pseudo-supply variable representing knowledge of the housing market, ability to make price comparisons between units, and ability to bargain for favorable rates. As a supply variable education should be negatively related to rent; from the demand function, however, a positive relationship would be expected. Numerous studies have revealed the strong positive relationship of income to housing expenditure; if only because of its usual positive correlation with income, education would also be expected to have a positive relationship to housing expenditures.

We noted at the beginning of Section III that for most variables it was not necessary to distinguish between their roles as supply and as demand variables. That is not true of education, however; we are interested in education's role as a supply variable, as a determinant of the terms on which households obtain housing. Our ability to separate out the supply effects of education depends on how well we can control for the quantity and quality variations of the housing bundle. It is at least arguable that if our controls for these are sufficiently good, we should be able to eliminate the positive demand effects of education. Just as one would not expect the price paid for a widget in a competitive market to depend positively on the education of the purchaser, so one would not expect the price of an identical housing bundle to be higher to the educated, even though there is a positive educational elasticity of demand. Having said this, we must admit that our quality controls, though numerous, are imperfect, and ambiguities of interpretation inevitably remain.

Our results are reported as regressions 7 and 8. The educational attainment of the head is estimated to have no effect on rent paid by white households, but to decrease the rent paid by black households. Furthermore, by allowing different slopes for the educational attainment of the black female-headed households and black male-headed households (regression 8), we estimate that increases in the level of education have no effect on the rents of male-headed households, whereas they decrease significantly the rent paid by black female-headed households.

Of course, the range in educational attainment in our sample is quite narrow, and it would be very questionable to interpret the coefficient for the dummy variable for black women in regression 8 as the rent premium that would be paid by households when the head had no schooling whatsoever. There are simply no reported observations at very low levels of educational attainment. Note, however, that a black female-headed household with an average level of educational attainment (9.5 years) is estimated in regression 8 to pay a premium of

$$9.71 - .73*(9.5) = \$2.83 \ ,$$

approximately the same amount estimated in regression 3.

In concluding this discussion of the effect of education, we may admit that the negative relationship for black female-headed households between rent and educational attainment may be a statistical artifact in our sample. There is no such relationship for other households, and the nature of the variable begs clear-cut interpretation of its effect. Nevertheless, this result is a partial affirmation of our view that the socio-

economic characteristics of families will have a significant bearing on the terms on which they can obtain rental housing.

IV. Concluding Remarks

Our basic conclusion is that black households in New Haven pay more for housing of comparable quality than do whites and that discrimination against black female-headed households is significantly larger than for black male-headed households. While black males pay about 7 percent more than white households, the discrimination markup for females is 2-1/2 times larger (about 17-18 percent). Furthermore, the racial composition of the neighborhood has an effect on rents for both white and black households: rents in all-black neighborhoods for households headed by males are likely to be as much as 13 percent higher than in all-white neighborhoods. Despite limitations created by the same size and design, our results are consistent with the general view that the worst rental values are secured by households that are black, uneducated, large, and headed by women with little or no independent income. There is good reason for emphasis on aid to these families, quite apart from any considerations of income maintenance.

The estimates in regressions 4 and 5 of Bailey's boundary effects are based on a limited number of observations and should be considered as quite tentative. Nevertheless, our results provide modest support for one aspect of the Bailey model: whites in white boundary areas seem to pay less for equivalent units than do whites in interior areas or blacks in the black boundary or ghetto areas. Thus, an incentive exists which should lead to expansion of the ghetto housing supply. Another implication of the pattern of rents

we observed for whites and blacks is that racial price differentials are made possible largely because segregation restricts the supply of housing open to blacks. In the black ghetto, the high demand for housing causes both whites and blacks to pay high and equal premiums. This finding emphasizes the need for and value of a housing policy which will increase the access of blacks to the entire housing stock.

A list of the variables used in the regressions is as follows:

Rent	Monthly rent inclusive of electricity, gas, water and heat.
Area	Total area of the apartment in hundreds of square feet.
Room	Number of rooms, excluding the bathroom.
Closiz	An index of total closet space = (no. of closets) X (scale variable which equals 1 for small closet, 2 for medium-sized closet, and 4 for large closet).
RoomQ	Index of room quality, on a scale from 1, 2, ..., 10.
LnRntSet	Natural log number of months since the present rent was set.
Distance	Distance from the center of the New Haven Green, in miles.
Pers	Number of persons per unit.
Outlets/Room	Number of electrical outlets per room.
Therm	A 0-1 dummy variable = 0 if the apartment has a thermostat.
Pests	A 0-1 dummy variable = 0 if there are no roaches, rats, etc.
Plumb	An index of the quality of the bathroom and kitchen plumbing fixtures, on a sclae from 1, 2, ..., 10.
Furn	A 0-1 dummy variable = 1 if the apartment is furnished.
Llive	A 0-1 dummy variable = 1 if the landlord lives in the building or nearby.
Lrel	A 0-1 dummy variable = 1 if the landlord is a relative.
Nappl	Number of appliances furnished, excluding stove and refrigerator (e.g., air conditioner, garbage disposal).
SandF	A dummy variable = 0 if neither stove nor refrigerator is furnished. = 1 if either stove or refrigerator is furnished. = 2 if both stove and refrigerator are furnished.
Extra	Number of 'extra' features furnished, such as parking privileges, carpeting, porch.
Lease	A 0-1 dummy variable = 1 if the tenant has a lease.
Info	A 0-1 dummy variable = 1 if tenant had resided in New Haven less than two years before renting his present dwelling. This variable is taken as a proxy for the information a household has about the housing market.
STRFIR/Unit	Number of structural fires in 1969 in the census tract in which the unit is located divided by the number of dwelling units in the tract.
Race	A 0-1 dummy = 1 if tenant is black.

P Neg	Percentage of population in the block that is black.
Sex head	A 0-1 dummy = 1 if head of family is a female.
Welfare	A 0-1 dummy = 1 if the tenant is on welfare.
Ghetto	A unit is defined to be located in the ghetto if it is located in a block 60-100% black and the surrounding blocks are 60-100% black.
Blkboun	A unit is located at the black boundary if the block is 60-100% black and the surrounding blocks are 0-60% black or if the block is 0-60% black and the surrounding blocks are 60-100% black.
Whtboun	A unit is located at the white boundary if the block is 20-60% black and the surrounding blocks are 0-60% black, or if the block is 0-20% black and the surrounding blocks are 20-100% black.
Int	A unit is located in the white interior if the block is 0-20% black and the surrounding blocks are 0-20% black.
Boun	A unit located in either the white or black boundary.
GH black	A 0-1 dummy = 1 if household is black and resides in the ghetto.
GH white	A 0-1 dummy = 1 if household is white and resides in the ghetto.
Blkboun blk	A 0-1 dummy = 1 if household is black and resides in black boundary.
Blkboun wht	A 0-1 dummy = 1 if household is white and resides in black boundary.
Whtboun blk	A 0-1 dummy = 1 if household is black and resides in white boundary.
Whtboun wht	A 0-1 dummy = 1 if household is white and resides in white boundary.
Int blk	A 0-1 dummy = 1 if household is black and resides in white interior.
Ed blk	Number of years of education completed by head of black households.
Ed wht	Number of years of education completed by head of white households.
Ed blk fem	Number of years of education completed by head of black female headed households.
Ed blk male	Number of years of education completed by head of black male headed households.

TABLE A

COEFFICIENTS FOR PRICE DISCRIMINATION REGRESSIONS
(Dependent Variable Rent/mo./Area)

	1	2	3	4	5	6	7	8
Variable/R	.886	.889	.889	.892	.893	.893	.890	.892
Intercept	15.19	15.58	15.77	16.50	16.75	16.76	15.43	15.72
1/Area	8.94	7.83	6.44	8.31	7.78	7.19	4.77	1.03
Area	-.41 (.73)	-.47 (.65)	-.44 (.53)	-.44 (.69)	-.47 (.65)	-.47 (.60)	-.45 (.40)	-.45 (.80)
Area/Room	-2.12 (1.92)	-2.03 (2.20)	-2.02 (2.05)	-2.06 (2.08)	-2.06 (2.14)	-2.04 (2.14)	-1.96 (2.08)	(2.11)
Closiz/Area	-1.39 (1.22)	-1.39 (1.23)	-1.56 (1.36)	-1.63 (1.44)	-1.65 (1.45)	-1.64 (1.44)	-1.55 (1.36)	-1.51 (1.33)
Closiz^2/Area	.06 (.98)	.06 (.93)	.06 (.99)	.07 (1.05)	.07 (1.08)	.07 (1.09)	.07 (1.00)	.06 (.96)
RoomQ	.10 (1.30)	.06 (.87)	.09 (1.23)	.07 (1.03)	.07 (.99)	.08 (1.11)	.10 (1.30)	.11 (1.47)
LnRntSet	-.54 (3.82)	-.53 (3.76)	-.54 (3.85)	-.58 (4.15)	-.55 (3.85)	-.55 (3.80)	-.56 (3.95)	-.54 (3.85)
Distance	.02 (.06)	.08 (.23)	.02 (.06)	.07 (.21)	-.05 (.14)	-.04 (.12)	-.04 (.13)	-.04 (.13)
Pers/Area^2	19.30 (3.08)	18.53 (2.99)	18.86 (3.02)	17.67 (2.88)	17.04 (2.76)	16.55 (2.66)	19.67 (3.13)	21.81 (3.44)
Outlets/Room	.70 (2.19)	.69 (2.17)	.63 (1.97)	.62 (1.93)	.62 (1.96)	.63 (1.98)	.65 (2.01)	.64 (2.01)
Therm	-1.01 (2.00)	-1.11 (2.21)	-1.00 (1.97)	-1.02 (2.01)	-1.05 (2.07)	-1.07 (2.10)	-.96 (1.68)	-.93 (1.84)
Pests	-.34 (.69)	-.47 (.94)	-.49 (.96)	-.58 (1.15)	-.62 (1.22)	-.56 (1.09)	-.49 (.96)	-.48 (.95)
Plumb/Area	4.92 (4.26)	4.95 (4.33)	5.15 (4.47)	4.93 (4.31)	4.83 (4.18)	4.88 (4.22)	5.27 (4.48)	5.47 (4.74)
Furn	1.34 (1.16)	1.28 (1.54)	1.26 (1.53)	1.19 (1.46)	1.16 (1.43)	1.23 (1.51)	1.26 (1.49)	1.30 (1.58)
Llive	-.71 (1.56)	-.64 (1.42)	-.67 (1.48)	-.71 (1.56)	-.67 (1.48)	-.72 (1.56)	-.63 (1.38)	-.64 (1.42)
Lrel	-1.50 (1.89)	-1.27 (1.60)	-1.57 (2.00)	-1.53 (1.91)	-1.49 (1.86)	-1.51 (1.88)	-1.44 (1.81)	-1.35 (1.72)
Nappl/Area	10.34 (2.54)	10.04 (2.49)	10.14 (2.51)	10.07 (2.51)	9.83 (2.44)	9.74 (2.41)	10.21 (2.52)	9.85 (2.46)
Sandf/Area	4.63 (2.39)	4.99 (2.59)	4.90 (2.55)	5.16 (2.69)	5.53 (2.83)	5.56 (2.84)	4.77 (2.39)	5.32 (2.77)
Extra	1.06 (1.82)	1.28 (2.19)	1.12 (1.94)	1.14 (1.95)	1.12 (1.06)	1.10 (1.88)	1.08 (1.85)	1.12 (1.95)
Lease	1.96 (3.57)	2.02 (3.72)	1.98 (3.64)	2.01 (3.73)	2.05 (3.75)	2.04 (3.72)	1.95 (3.49)	1.98 (3.66)
Info	1.28 (1.95)	1.14 (1.75)	1.12 (1.71)	1.06 (1.63)	1.03 (1.57)	.98 (1.49)	1.09 (1.66)	1.15 (1.77)
STRFIR/Unit	-.0016 (.15)	-.01 (.98)	-.003 (.24)	-.009 (.78)	-.009 (.71)	-.008 (.66)	-.002 (.21)	.0003 (.02)

TABLE A (continued)

	1	2	3	4	5	6	7	8
Sex head	.99 (1.93)	.93 (1.84)						
Race	1.91 (3.17)	.98 (1.35)						
P Neg		.023 (2.22)						
Male blk			1.25 (1.84)				3.63 (1.90)	1.68 (.85)
Fem blk			2.93 (2.97)	2.23 (2.64)	2.25 (2.65)	1.73 (1.65)	5.20 (2.64)	9.71 (3.09)
Fem wht			.26 (.41)				.37 (.57)	.37 (.59)
Welfare			1.10 (1.05)			.92 (.86)	1.16 (1.10)	1.37 (1.31)
GH black				1.90 (2.20)	1.94 (2.23)	1.87 (2.15)		
GH white				1.92 (1.40)	1.94 (1.40)	1.94 (1.41)		
Bounblk				.54 (.64)				
Bounwht				-.51 (.82)				
Int blk				.25 (.17)	.32 (.22)	.26 (.18)		
Blkboun blk					1.15 (1.03)	1.09 (1.97)		
Blkboun wht					.33 (.27)	.31 (.26)		
Whtboun blk					.006 (.006)	.13 (.12)		
Whtboun wht					-.67 (1.04)	-.70 (1.07)		
Ed blk							-.19 (1.20)	
Ed wht							.03 (.44)	
Ed blk fem								-.73 (2.26)
Ed blk male								-.04 (.22)

t statistics in parentheses below each coefficient. A t value greater than
2.32 (1.28) indicates significance at the 1 (10) percent level, using one-tail
t-test.

DATA APPENDIX

The data analyzed in this paper were collected in a three-stage survey between October, 1968, and April, 1969. Altogether, information on about 220 rental units was collected. In the first stage, which yielded 75 observations, we selected units randomly in black and white neighborhoods, but tried to insure that the numbers of black and white units surveyed were approximately equal. In the second stage, which yielded 125 observations, we drew addresses at random from the City Directory. The descriptions of the units surveyed in these two stages were obtained by a single enumerator who visited and rated the units. About one-third of the households she contacted cooperated with the survey. Because of the time and expense involved in the personal survey, we attempted to obtain information in a third stage, using a mail survey. The length and complexity of the questionnaire necessitated sending it only to a group of Yale graduate students and faculty. This stage yielded about 20 usuable questionnaires. A Chow test gave no evidence that the relationship of rents to housing characteristics in this group was different from that in the rest of the sample. While our sampling procedures were obviously not perfect, we believe that the sample is generally representative of the New Haven rental market. One part of the market not sampled is units of new luxury high-rise structures; our survey was almost completely restricted to rental units in two- or three-story structures, which are characteristics of much of New Haven housing.

Blacks constituted about 23 percent of New Haven's population in
1967, and black households were about 25 percent of our sample. One weakness
of the black sample is the underrepresentation of one major black area, census
tracts 4-8, where nearly 30 percent of New Haven blacks lived in 1967.
Observations from these tracts are only 10 percent of our black sample.
About 60 percent of the black sample was drawn from the Dixwell neighbor-
hood (census tracts 15 and 16), where 40 percent of New Haven blacks lived
in 1967.

Because our sample is relatively small, some housing and household
characteristics have limited variation. For example, of the 55 black house-
holds surveyed, only one was headed by a college graduate and only twelve
by an individual with twelve or more years of schooling. Nevertheless,
in most respects the data are quite varied. Few households had incomes
greater than $15,000, but 25 percent had incomes greater than $10,000, and
30 percent had incomes less than $5,000. New, first-class rented housing
was not surveyed, but the range of size and quality of the units was, never-
theless, great.

Most of the variables used in the regression analysis are self-explana-
tory; however, two, the rent and quality measures, require comment. The
monthly rent for some units includes such utilities as heat, hot water,
gas, and electricity; the rent for other units does not. We have defined
rent as inclusive of all these utilities; and when the rent did not actually
include them, we added the tenant's estimate of the monthly bill for each
item to the rent he paid. An alternative procedure would have been to sub-
tract the cost of utilities from rents which include them by estimating

their value or including dummy variables in the regressions. Our method
was somewhat easier; however, it does create the possibility that the esti-
mate of the effect of family size on rent will be biased upward because
large families use more utilities. We suspect that the bias is negligible
and, in any case, see no reason for believing that our estimates of the
effects of racial discrimination will be affected by the comprehensive de-
finition of rent.

The quality of floors, walls, and ceilings and of various bathroom
and kitchen fixtures were rated on ordinal indices from 0 to 10.[1] The in-
dices should be viewed as a shorthand for describing the quality characteristics
of the units. There is no comparability between different scales in terms
of replacement costs or expenditures that would be required to transform
some characteristic to a higher rating on the scale. As an example of the
floor index, new linoleum, tile, or newly varnished wood was rated 10;
worn linoleum or floorboard, 7; and sagging, rotting floors, 0. The ratings
for kitchen and bathroom fixtures were based on size, material, cabinet
space, and number of spigots. The indices were averaged across rooms and
combined to provide one index of the quality of walls, floors, and ceilings
(room quality) and another of the quality of plumbing fixtures. This pro-
cedure has obvious shortcomings, and there is no clear-cut interpretation
of the regression coefficients for these quality variables. Nevertheless,
we believe that these variables provide adequate controls for some of the
more important quality features of the rental unit. In regressions not

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[1]The scales are available from the authors on request.

reported in this paper we experimented by entering the quality measures in several non-linear specifications, one of which allowed for different slopes on different segments of the measured range of quality. None of these experiments improved upon the results reported in this paper.

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