A STUDY OF RACIAL DISCRIMINATION IN HOUSING

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I. INTRODUCTION

Basic Issues Involving Minority Oriented Housing Policies

For over a decade the Department of Housing and Urban Development has been given an explicit mandate to monitor the problems of minorities in acquiring housing and to develop programs aimed at ameliorating these problems. HUD's success in achieving positive results in urban housing markets will have an impact on progress toward other minority oriented social objectives, such as equality of educational opportunities, equal access to public services and work opportunities, and fair representation in the local political process. In essence, HUD's mandate is tied directly to and is an integral part of the larger social objective of achieving a reasonable measure of integration and assimilation of all groups into American society. In this context, equal opportunity for minorities in the housing market is only a part of the overall goal.[1] While equal opportunities for minorities could be achieved at least to a great extent without social integration, integration appears to be an important objective in itself and thus becomes a joint product along with equal opportunity.

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[1]At this time equal opportunity appears to be the foremost objective, though this issue remains an important topic of debate. Some argue that total equality of opportunity, indeed, requires social integration. At this point in time, however, the arguments presented seem to be more a matter of semantics than of substance.

However, given the breadth of the social problems faced by minorities, it is obvious that housing policies alone will not solve them. In fact, in many instances it now appears that explicit housing programs may in themselves be insufficient to provide long run solutions to most of these problems, including, ironically enough, even "housing problems" for which HUD has direct responsibility. Policies and programs with respect to employment, income redistribution, fiscal equity, crime, public services, education, and transportation also have a bearing on the solution of minority housing problems. Furthermore, it must be realized that many problems faced by minorities in the housing market are not unique to them, but are problems faced in common with all low to moderate income households.

While issues with respect to minority access to adequate housing are very complex and intertwined with a host of other problems, the research reported in this text is limited to specific issues that by their very nature are unique to minorities in the housing market and for which a proper understanding is requisite for the development of rational and cost effective housing programs.

Amazingly, after years of research and policy discussion, there still exists much confusion over the nature and extent of minority housing problems. Obviously there appears to be a considerable amount of minority segregation in urban housing markets. On the other hand, there is still very little concensus with respect to its extent, causes and policies that might provide workable solutions.

Statistical data suggest that minorities consume less housing, even

after controlling for income and other social-demographic factors. Such patterns of observed minority housing comsumption are in harmony with the basic concept held by many analysts who consider Blacks to be limited by a very restricted supply of housing. It was assumed only natural that Black households would thus turn to the consumption of other goods where they had better access. If this scenario is correct, the policy implications are rather straight forward: break down housing market restrictions and open up housing opportunities to minorities that were previously closed. Unfortunately such policies are too naive and are too often implemented without great thought.

Even more disconcerting is that the basic assumption that Blacks underconsume housing has not been seriously questioned nor have rigorous attempts been made to understand the phenomenon. Today, in light of more sophisticated analyses of available data, it no longer is clear that Blacks underconsume housing once their economic status is fully taken into account. With the weakening of these assumptions, once taken for granted, past explanations and subsequent policy prescriptions also must be questioned.

Unfortunately this problem is not limited to assertions of underconsumption. Assumptions with regard to low Black home ownership rates and higher housing prices faced by Blacks are also beginning to be questioned.

Given the current confusion, two steps need to be pursued. First, the basic differences between housing consumption patterns of Blacks and Whites need to be re-examined and requantified. Second, additional analyses are required to adequately explain such differentials. Only then can useful policy options be considered and unfortunate mistakes be avoided.

Until some rather basic questions are answered with respect to minorities in the housing market, policy makers may be forced to discover, the hard way, the counterproductiveness of many policies and programs. These include community development strategies, subsidized housing programs and site selection criteria involving public housing or rent supplement housing programs. The task is rather large.

This research is not intended to be comprehensive. In fact, it represents only a modest beginning in a continuing effort to put all of the pieces together. It's focus is aimed at clarifying some basic facts with respect to housing and minorities and to begin to develop an understanding of the differences in minority/non-minority patterns of housing consumption that can directly aid housing policy development.

Research Focus

Considerable attention is given in the economics literature to the housing market experience of minority households, especially Blacks. This voluminous literature, however, fails to provide a basis for concensus. In fact, a large degree of controversy remains both with respect to the empirical findings and with respect to the interpretation of the results. In addition, as pointed out by Yinger (1978), little effort has been spent on rationalizing empirical findings with theoretical models of housing market discrimination. This has clearly hampered efforts to interpret the empirical results of past analysts.

The purpose of this study is to re-examine some of the basic issues surrounding discrimination in housing markets and observed phenomena purported to be consistent with the presence of discrimination. While both Blacks and Mexican-American are analyzed, the primary focus is on Black households.

Three issues dominate this research. First, the potential of housing price differentials between Blacks and Whites is examined. Second, the apparent underconsumption of housing by Black households is analyzed, and finally the relationship between tenure choice (owner/renter) and race is reappraised. For each issue, past studies are reviewed and critiqued, the important conceptual and empirical problems are summarized, and alternative approaches to the analysis of each question are explored.

The primary stimulus for this study is the existence of a considerable amount of conflicting results which are found in the current literature. Past studies, it is argued, are flawed by inappropriate methodologies or severe data limitations. In addition, particularly important issues are ignored in previous studies. Two such examples are: (1) the role and importance of wealth in housing consumption, especially with respect to minority acquisition of housing; and (2) the difference in the consumption of housing by Blacks in "segregated" markets versus Blacks who have broken social barriers and have acquired housing in predominately White neighborhoods. Finally, inferences from empirical results are made too casually. Analysts typically fail to rigorously demonstrate that the phenomena they observe do, in fact, substantiate their conclusions about housing markets. Too often the results cited are necessary, but not sufficient evidence to

substantiate such conclusions.

Consider one particularly interesting example. Many analysts find that Blacks appear to underconsume housing. This finding is immediately accepted as evidence of explicit market discrimination and exclusion. Few seriously consider their results in light of other differentials found between Blacks and Whites. Because the underconsumption by Blacks seems to be consistent with popularly held concepts of discrimination (where Blacks are limited in their consumption of housing by restricted supply), alternative hypotheses are ignored. Occasionally, obvious alternative explanations are overlooked, such as the interpretation of Black underconsumption as merely a reflection of White overconsumption. This alternative view has very different implications about the impact of racial prejudice on Black households. Yet, it is fully consistent with most reported empirical results regarding the so-called Black underconsumption phenomenon.

In light of the complexity of the issues involved and the current amount of disagreement in the literature, the research described here must be considered a modest effort. Many questions are left unanswered. However, to the extent that this study helps explain the discrepencies in past findings and stimulates further research to continue the reconciliation of the race and housing literature, these efforts will have been successful.

The analysis presented in this report draws upon data collected for the city of Houston during 1976. However, previously collected data for Chicago as well as national data obtained from the National Longitudinal Survey are also used. For the most part, the results presented here are

considered to have broad national implications. Though some of the results may be specific to Houston, the basic generalizations made and the methodological issues raised have universal application.

Section II describes the data bases used in the analyses to follow. Sections III through V present in detail the basic research questions, the alternative approaches considered in this study, and the empirical results that were obtained. Section VI discusses the apparent policy implications of these empirical results.

Brief Summary of Findings

The analysis presented in this text produced many important results. Strong evidence is provided that Blacks actually pay less for housing in both the Houston and Chicago housing markets. These lower prices, however, can be almost totally explained by differences in the levels of locational amenities that exist between each of the five types of neighborhoods studied which were defined in terms of their racial composition. In fact, given the neighborhood characteristics of transition or integrated areas, it appears that Blacks actually pay higher prices in those areas than would be "expected." In addition, an examination of separate rates of housing price inflation for each of these racially defined areas in Houston indicates that the price differentials are not converging over time but are actually becoming larger. The overall rate of appreciation of home prices in Houston between 1970 and 1977 averaged approximately 110%. However, housing in Black, integrated and "border" areas appreciated at lower rates. Nonetheless, the lowest rate of appreciation found was 79%, a figure not typically

associated with neighborhood housing markets that are depressed or declining.

Evidence was found to substantiate the fact that even after accounting for their socio-economic status, Black's are likely to underconsume housing. However, the empirical results are not particularly robust and their interpretation and policy implications are ambiguous. First of all, it appears that the magnitude of this effect is highly sensitive to specifications of income used in the analysis. Black underconsumption of housing may actually be more a function of the nature of the income creation process of Black households than of housing market distortions. For example, Blacks in Houston were found to earn about 20% less with the same basic endowments of human capital (education, occupational status, age, etc.). This finding is not only consistent with many labor market analyses, but is remarkably similar to the 18-25% underconsumption of housing by Black households and may, in part, explain the phenomenon. In fact, when a wide variety of estimated or "expected" income variable are used in regression analyses of housing demand, the underconsumption effect falls dramatically and in some cases completely disappears.

While part of the Black underconsumption of housing may be explained by appropriately defining income, the lower housing prices faced by Blacks may also explain the phenomenon. This is especially true when underconsumption is defined in terms of housing expenditures. The price differential of about 20% between Black and White areas is startlingly similar to the estimates of Black underconsumption or underspending.

Since it is found that about 50% of the price differential in many

of the racially defined neighborhoods is in the form of a separable price shift as opposed to changes in the marginal prices of housing attributes, the possibility exists that the lower prices paid by Blacks could explain much of the apparent underconsumption effect. This latter hypothesis, however, is weakened somewhat by estimates of separate demand functions for individual housing attributes similar to that done by Kain and Quigley (1975). The results for Houston indicate that Blacks underconsume housing quality but not land (lot size) or living space (square feet of interior living area), though the underconsumption of "house quality" as estimated with the Houston data is still sensitive to alternative definitions of income used in the analysis.

The results of this research also indicate that Blacks have a 15 to 25% lower probability of homeownership, ceteris peribus. The inclusion of net wealth in the estimating equation lowers the differential in the marginal probability of ownership from about -.22 to near -.14. These results, it is shown, are sensitive to both alternative income variables used and to the representativeness of the sample.

Kain and Quigley suggest that the primary importance of wealth arose out of the relationship between net wealth and equity accumulation through previous ownership. This would seem especially applicable in the inflating Houston housing market. However, net wealth is consistently an important explanatory variable even when previous tenure (owner/renter) is controlled for or when wealth is made endogenous in two-stage estimations. This suggests that wealth is important as a separate and distinct element of a household budget constraint.

While "segregation" in areas with more rental property might be thought to explain part of the tenure distortion phenomena, the fact is that most Black expansion in the past decade in Houston has occurred in predominately single-family, owner-occupied areas. Only during and after racial transition did these areas begin to be converted toward rental property. Further analysis, beyond the scope of this study, is required in order to understand fully the limitations on Black ownership. The results presented here suggest that future explorations would do well to focus upon the availability of credit to minority households and upon the phenomenon of segregation and Black expansion into previously all White areas. It may well be the case that the dynamics of racial transition result in forces that lead to excessive conversion to rental property and to relative price incentives that make home ownership less attractive to Blacks. In addition, it seems necessary that the analysis of Black home-ownership be examined in more detail within the context of Muth/Bailey type prejudice models, for the lower ownership rates among Blacks may merely reflect abnormally high ownership rates for Whites who see ownership and overconsumption of housing as an additional means to perpetuate segregation.

II. DATA

The data used in this research comes from a wide variety of sources. Brought together they represent a rather broad and comprehensive data base. Because several alternative strategies were employed in obtaining the requisite data, there does not exist a single data base. Gaps in the data to accomodate a particular analysis were filled during the process of the study. Consequently, some of the data acquired has the requisite information for the analysis of price differentials while other data is only useful in examining tenure choice. In most cases the data sets used are overlapping, but are not always identical. To avoid confusion, a description of the primary sources of the data is presented in the text with a list of the various data sets used for different types of analyses provided in the Appendix.

Sources

Information pertaining to individual housing units, including market values and comprehensive list of variables describing each property in question, were obtained from data published by the Society of Real Estate Appraisers (SREA). Of the 100,000 observations obtained for 1970 through 1977, a random selection of 3736 observations for the period of 1976-77 and 2112 observations for the period 1970-71 were used. Accompanying this data are property addresses and a Key Map geo-code that allowed for precise location of each property.[1] The data is consequently geo-coded by census

[1] Key Map, Inc. provides detailed maps for Houston that provide cross grids that allow any parcel of land or real property to be located within an area of approximately 50 city blocks.

tract, zip-code, police district, school district, etc.

In addition to the SREA data, primary data were obtained by mail survey questionnaires. The purpose of the survey questionnaires was to provide essential information on demographic and economic characteristics of households who either were renting or purchasing. Of those responding, 639 are directly tied to households whose properties appear as an observation in the SREA data file. In addition, another 61 surveys were obtained from owners not found in the SREA data. The surveys also include responses from 165 renters. Table I below gives a summary of the distribution of the surveys by family type.[2] The questionnaire also provided information on housing choice and housing market experiences.

All SREA and survey data are geo-coded into census tracts. Some census data are used in city-wide hedonic estimations. In addition, Census Block data for 1960 and 1970 are used extensively in mapping neighborhood areas by racial composition. Black (100% to 65% Black), Integrated (65% to 5% Black), Border (less than 5% White adjacent to Black or Integrated areas), and all White (less than 5% Black) areas are defined. From the Houston Community Study (1977), projections are provided to split the Border areas into those where racial transition is expected in the next decade versus border areas where the status quo is anticipated to be maintained.

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[2]For some groups, the response rate was disappointing. Several approaches were taken to increase the sample size including pre-telephoning, post-telephoning, telephone surveying and site surveying. Special attention was given to increasing our sample of renters and Black households.

TABLE I

DISTRIBUTION OF SURVEY AND HOUSING DATA
BY
HOUSEHOLD TYPE AND NEIGHBORHOOD LOCATION

Survey

	Blacks	Whites	Totals
Owners (SREA)	86	553	639
Owners (Non-SREA)	28	33	61
Owners (Total)	114	586	700
Owners (Special Black sample in White areas)	52		52
Renters	38	127	165
Totals	204	713	917

SREA Data

Areas	1976-77	1970-71
Black	259	301
Integrated	302	306
Border (Transitional)	489	251
Border (Non-Transitional)	254	180
White	2543	1414
Total (Non-Overlapping)	3736	2112

Pollution data were obtained from the Department of Public Health, Pollution Control Division, City of Houston; crime data were obtained from the Police Department, City of Houston; comprehensive school data were obtained from the Houston Independent School District (HISD) and selected districts outside the HISD boundaries. The pollution, crime and school data are geo-coded into all appropriate data sets including the SREA and survey data. In addition a matrix of distances between the centroid of all census tracts and 7 areas of importance with regard to accessibility was created. This includes distance to the CBD and other key work centers and transportation facilities in Houston. This distance matrix is also merged into all relevant data sets.

Since companion studies for areas other than Houston are discussed below, it should be mentioned that data obtained from the National Longitudinal Survey and SREA data for Chicago are also used. The former are used in examining consumption decisions and the latter in analyzing Black/White housing price differentials. A more complete description of the data sets that are used in this study is provided in the Appendix, where they are categorized according to the dominant type of analysis for which they are applied.

III. HOUSING PRICE DIFFERENTIALS IN AREAS OF DIFFERENT RACIAL COMPOSITION

Past Studies of Housing Price Differentials

In summarizing the state of the arts, Muth (1974) comments that the findings of the better studies of racial differences in housing prices are "clearly mixed." Muth could well have added that there is ample empirical evidence on housing prices to substantiate almost every existing theory of racial discrimination in the housing market. While some of the past literature is clearly superior to others, no article appears flawless.

The earliest literature seems to be dominated by findings that, holding quality constant, housing in Black areas is generally priced lower. However, often these results are only of secondary importance to other research objectives. For example, the coefficient of a variable such as percent Black is often found to be negative in a typical hedonic regression, where the primary focus of the analysis is directed towards measuring the implicit value of a neighborhood amenity such as clean air. Unfortunately, even the recent literature that focuses directly on the race issue provides little basis for concensus, either with regard to the sign or magnitude price differentials.

(a) Lower prices in Black areas.

During the past two decades several studies have concluded that prices in Black neighborhoods are significantly lower than elsewhere in a metropolitan area. In an early study, Bailey (1966) finds that while the racial

composition of a block does not affect home prices, the percentage of Blacks in surrounding areas lower prices by as much as 60%. Straszheim (1974, 1975) concludes that most housing prices are about 10% lower in dominately Black areas but that prices in Black areas are higher for newer housing units with relatively large lots. In the Straszheim work, rental unit prices (rents) are lower for all subclasses.

Several other studies come to similar conclusions. Daniels (1975) finds that the price (rent) of rental housing in Black areas is 6% lower than in White areas and that it is even lower in integrated areas. Olsen (1974) discovers rental prices lower for Black areas in New York City. Results by Schnare (1976) indicate the price of housing units falls with increases in the percent Black within a neighborhood (census tract). For 1960, Schnare finds that the lowest prices paid for housing were in areas with approximately 25% Black. In 1970, the decline was continuous for values ranging from 0 to 100% Black.

In a rather extensive study, Berry (1976) also finds a negative correlation between the percent of Blacks in an area and housing prices. Berry, however, does not use a continuous race variable. Instead, he examines housing prices in White, White border, Black expansion, and Black areas. Housing prices are found to be 18% less in Black areas compared to White interior areas. The general pattern across all neighborhood types indicates that, in comparison with White interior areas, prices in White border areas are significantly lower; prices in Black expansion areas are somewhat less depressed (that is, they recover somewhat); and that in Black areas, prices are at their lowest level. Berry's study, while subject to serious questions,

nonetheless, is found appealing by many because his results are compatable with a rather wide set of theoretical models of discrimination.

Applying a much different approach, Galster (1977) finds that rents in White border areas are actually 20 to 50% less than what Blacks would be willing to pay. Galster interprets this to mean that barriers exist to prevent Black instrusion or otherwise to keep Black bids from being actualized. This result, in direct contradiction to Berry's results, suggests that the primary effect is at the border and presumably could adversely affect Whites as well as Blacks who are prevented from moving in. Galster's findings seem to indicate that housing prices in Black areas are lower for Blacks and that it is primarily the Blacks who attempt to penetrate the borders who are impacted by some form of exclusion or price discrimination.

(b) Insignificant differences.

In contrast to the studies above, other research indicates virtually no differences in housing prices between Black and White areas. Lapham's (1971) work is probably the best known. Lapham's study was limited to Dallas, but the findings are relatively strong given Dallas' high degree of segregation. While differences exist between the "shadow price" of certain housing attributes in White and Black areas, the overall price effect is negligible. Similar findings are reported by Schnare and Struyk (1975). These more rigorous studies, thus, tend to verify much earlier studies such as that by Nourse (1966) which finds race to have an insignificant impact on housing prices.

(c) Blacks pay more.

Though much of the literature indicates that Black housing prices are the same or less than prices in White areas, even more research finds that housing prices are higher in Black areas. One of the earliest papers by Rapkin (1966), indicates that these higher prices are particularly large for the Black middle class. However, the extent of the price differentials found in this subset of the literature has a large range.

Kain and Quigley (1970) originally estimate that the price differential is +8% for owners and +5% for renters in Black areas. Later Kain and Quigley (1975) indicate that the prices of housing in Black areas range anywhere from 1 to 50% higher. Yinger (1975) estimates housing prices to be in the order of 25% higher in boundary and predominantly Black areas. Gilligham (1973), however, finds this differential to be only +4% to +13%, and Ridker and Henning's (1967) results indicate the differential is only about +10%.

One of the most rigorous articles which concludes that Black area prices are higher is by King and Mieszkowski (1973). Their results indicate that prices (rents) in the Black interior are about 9% higher than prices in the White interior. Finally, Vaughn (1975) also supports the basic finding that a positive price differential exists for Black areas, but he indicates that it has been reduced in recent years by Black expansion into previously all White areas. This finding strongly suggests that a consideration of the date of the data analyzed is important when comparing different studies.

Haugen and Heins (1969) provide a partial explanation for the existence of such a wide range of results found in the literature. Their basic finding is that Black/White rent differentials in different urban areas depends significantly on the nature of the city. For example, the extent of "Ghetto centralization," the growth rate of the Black population and the rate of suburbanization strongly affect differentials between SMSA's. Given that many of the studies discussed above examine different data sets for different cities and for different time periods, there may be no reason to assume that their results should be the same.

(d) Prices and Neighborhood Transition.

In addition to the confusion over Black/White housing price differentials, there is also debate on the impact racial change can have on housing prices. There has for some time existed a popular belief that movements of Blacks into an area depress home prices. This is one of the alleged motives for rapid transition and White flight, as Whites attempt to sell before they incur severe capital losses due to declining property values. However, the literature, though limited, tends to reject the notion that Black intrusion leads to significantly depressed neighborhood housing markets.

The most recent study by Dobson (1976) examines price trends between similar areas remaining White and those that became occupied in part or totally by Blacks. Dobson's results indicate that there exists no significant differences in price patterns for areas experiencing Black immigration either just before the racial change, during the change, or after the change. Dobson thus provides support for the earlier conclusion of Laurenti (1960)

who makes an even stronger statement from his empirical research. Controlling for other factors, Laurenti concludes that Non-White entry into previously all White areas may actually lead to an increase in prices rather than to a decline. Nonetheless, these findings must be contrasted to Berry's results, which show that prices in White border areas where transition is eminent are severly depressed and only recover slightly in new areas of recent Black expansion.

Discrimination and Housing Price Differentials

The empricial literature is not only confusing, but it fails to provide help in evaluating current theoretical models of discrimination in urban housing markets. The theoretical literature is broad and unconclusive. In order to understand this literature it is useful to categorize it into two major groups.

The first type of model basically ignores spatial aspects of the housing market and "border" phenomena in a world of segregation. Instead, this literature concentrates on implicit restrictions on the supply of housing to Black households. The supply restriction is expected to force housing prices up in Black areas, a phenomena which would require a rather strong centralized control over racial movement within an urban area. Nevertheless, this rather simple, yet popular, construct provides the basis for the hypothesis that housing prices should be higher in Black areas.

The second type of model (often referred to as the Muth/Bailey model) concentrates on an equilibrium process at the border where a price differential emerges such that no further incentives exist to "transform" neighbor-

hoods from White to Black. Given the assumption that Whites are adverse to living near Blacks and Blacks are either indifferent or prefer living near Whites, the end result is that prices in the White "interior" will exceed prices in the Black "interior," while prices at each side of the border are equal. This, of course, provides a rationale for the estimates of lower prices in Black areas.

The Muth/Bailey models of prejudice predict that Blacks will actually pay less for housing, while the exclusion models, where supply to Blacks is restricted, predict that Blacks will pay more. Yinger (1977) provides a good summary of both the internal inconsistency of many of the models of discrimination and prejudice and their external inconsistency with empirical evidence. While Yinger's work offers some important insights, his conclusions must be viewed with caution since the problem still remains that the empirical evidence by no means provides a reliable benchmark. Futhermore, even Yinger fails to carefully delineate just what constitutes necessary and sufficient evidence to verify these alternative hypotheses. This results in premature judgements regarding the validity of theoretical models and regarding the "reasonableness of empirical findings."

Conceptual Issues

(a) The "price" of a house.

It is felt that much of the confusion in the literature is due to a lack of understanding of just what constitutes the "price" of housing and subsequently a price differential. Most empirical studies examine house

values while "controlling" for differences in housing quality. Implicit in most studies is the assumption made by Muth (1969) that house value, HV, is equal to the price per unit of housing services, P, times the amount of services provided by a dwelling (or housing quality) Q: $HV = P \cdot Q$. Implicit in this assumption is that the average price per unit of quality and the marginal price are the same, $HV/Q = \partial HV/\partial Q = P$. However, alternative specifications may be more appropriate, especially when the theoretical concept of quality or housing services is given substantive meaning by using actual housing attributes as independent variables in hedonic regression estimates to "control" for quality.

One alternative specification is $HV = a + bQ$, which differentiates between two separate types of price shifters: a, the lump sum price paid for a house in a given location; and b, the implicit marginal price of additional Q. Average price and marginal price are no longer the same, where $AP = b + a/Q$ and $MP = b$[1].

This distinction regarding the components of price is quite important. First of all, only b directly belongs as an argument in the demand function. As such, it is changes primarily in b not a that will affect the consumption of housing services in different locations of an urban area. Traditionally the question of whether Blacks pay more for housing has been of interest

[1]It should be noted that the issues regarding the nature of the "price" of housing are rather complex, involving important distinctions between the theories of quality found in the works of Lancaster (1966); Muellbauer (1975) and Rosen (1974). A completely rigorous consideration of all issues requires that housing be considered a bundle or package of attributes which are made available through a single purchase in what Rosen terms "implicit markets." In this study, the consideration of housing as a composite good (in the Muth tradition) but in a manner that allows for the basic non-linearities that can arise in a more complicated (yet realistic) framework, represents a necessary compromise, given the current state of the arts.

because of the potential impact price differentials may have on Black consumption patterns. However, past studies have failed to distinguish between marginal and average prices and thus recognize that it is primarily differentials in $\underline{b}$ that are of importance in analyzing Black/White consumption differences.

In general, the difference between $\underline{a}$ and $\underline{b}$ from cross section comparisons stems from neighborhood differences. Changes in $\underline{a}$ represent a first order approximation of the value of amenities between neighborhoods. Changes in $\underline{b}$ reflect supply and demand equilibrium. That is, $\underline{b}$ represents market determined marginal prices given the existing characteristics of the stock of housing and submarket demands generated from the type of household that lives in each area. For example, a high amenity neighborhood which is attractive to upper middle class residents (they are the highest bidders for the area and the housing there) may have many housing units with subnormal living space. The lack of larger homes coupled with a higher demand for the area may raise both $\underline{a}$ and $\underline{b}_i$, the latter being the shadow price or marginal value of additional living space.

On the other hand, two <u>new</u> developments are apt to differ in price in terms of $\underline{a}$ only because of differing amenities. $\underline{b}$ will be determined by costs in these areas with new construction and should not differ significantly between areas. Hence, across various neighborhoods, "prices" may differ in a wide variety of ways and any analysis of price differentials must take this into account. The relationship between these two components of the price of housing and the empirical results involving Black/White price differentials is discussed in more detail below.

(b) Differences in the two price components.

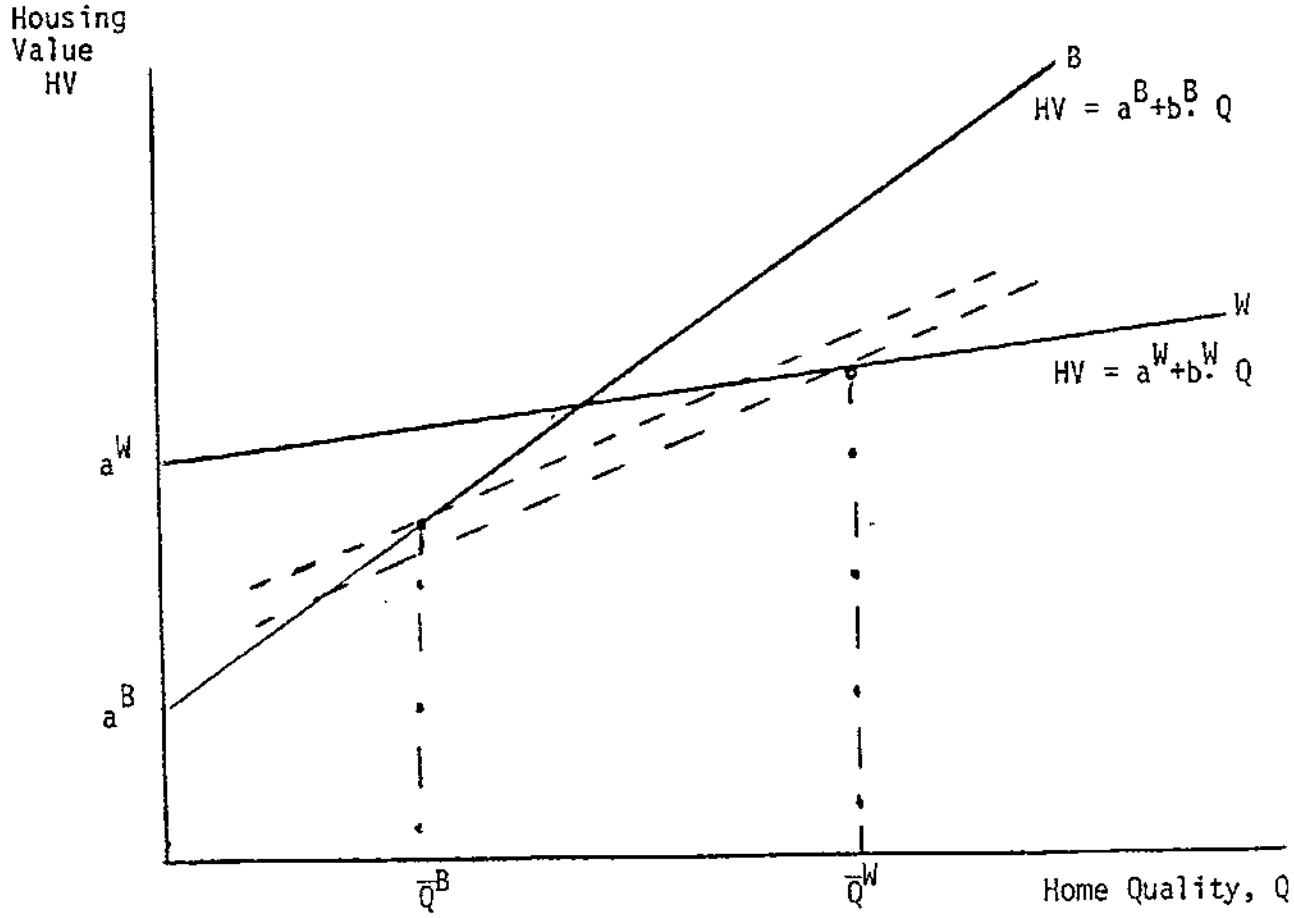
Consider for the moment that Black and White areas are segregated into segmented housing markets. To test whether Black's pay more for housing, one of three approaches is typically used. All involve some form of hedonic estimation. The first approach includes a Black/White dummy variable in the estimating equation; the second a percent Black variable; and the third approach involves the estimation of separate hedonic equations for each racially delineated area, followed by a comparison of the estimated price (value) of housing obtained from the separate equations for a given set of structural characteristics.

First, consider the case where the actual house price functions are distinguished by the following: $\underline{a}^B < \underline{a}^W$ and $\underline{b}^B > \underline{b}^W$. That is, the constant term or intercept of the housing price function is higher for Whites while the marginal cost of Q is higher for Blacks. Diagramically the relationship looks like that shown below in Figure 1.

Assume now that all or most of the Black observations are associated with lower levels of Q than are the White observations. Estimating the relationship between HV and Q using either a dummy variable for racial composition or a percent Black variable forces the slope coefficients to be the same. Differentials are detected only by differences in the shift coefficient, $\underline{a}$. In the example shown in Figure 1, if a Black/White dummy were used, the sign on the coefficient would indicate that Blacks pay more. However, if the mean value of Q for the White subsample, $\overline{Q}^W$, were smaller and $\overline{Q}^B$ were larger than that shown in Figure 1, one could get the opposite

FIGURE 1

House Value Functions
Within
Black and White Submarkets



Key: _____ Actual Black and White House Value Functions

– – – – – Estimated House Value Functions with Race Dummy Variables
$(HV = a \cdot D + b \cdot Q)$

results, despite the fact that the White and Black price structure, the parameters a and b, remained exactly the same.

If the variable percent Black were used and if percent Black and Q are highly negatively correlated, then the sign of the coefficient will depend upon the nature of the data used and whether sufficient data exists for integrated areas, such as areas with 50% Black. In this case, shown in Figure 2, as percent Black (%B) increases, "prices" rise and then eventually fall. This effect can be captured by including (%B) and $(\%B)^2$ in the estimating equation as does Schnare (1976). If the data is strongly polar, as is usually the case, the sign on %B without the quadratic term could be either positive or negative, again depending upon the gap between $\bar{Q}^W$ and $\bar{Q}^B$ and their relative location with respect to the intersection of the two functions.[1]

If the third approach is used, where two separate equations are estimated, then both the shift and slope coefficients are obtained, providing fuller information with regards to the differing structure of prices. However, in cases such as those above, where $\bar{a}^W > \bar{a}^B$ and $\bar{b}^W < \bar{b}^B$, often an unambiguous conclusion still cannot be reached. If, the White and Black house value equations intersect and if $\bar{Q}^B$ and $\bar{Q}^W$ straddle the point of intersection, then Blacks can be shown to pay either more or less, depending upon the consumption bundle used to measure the difference.

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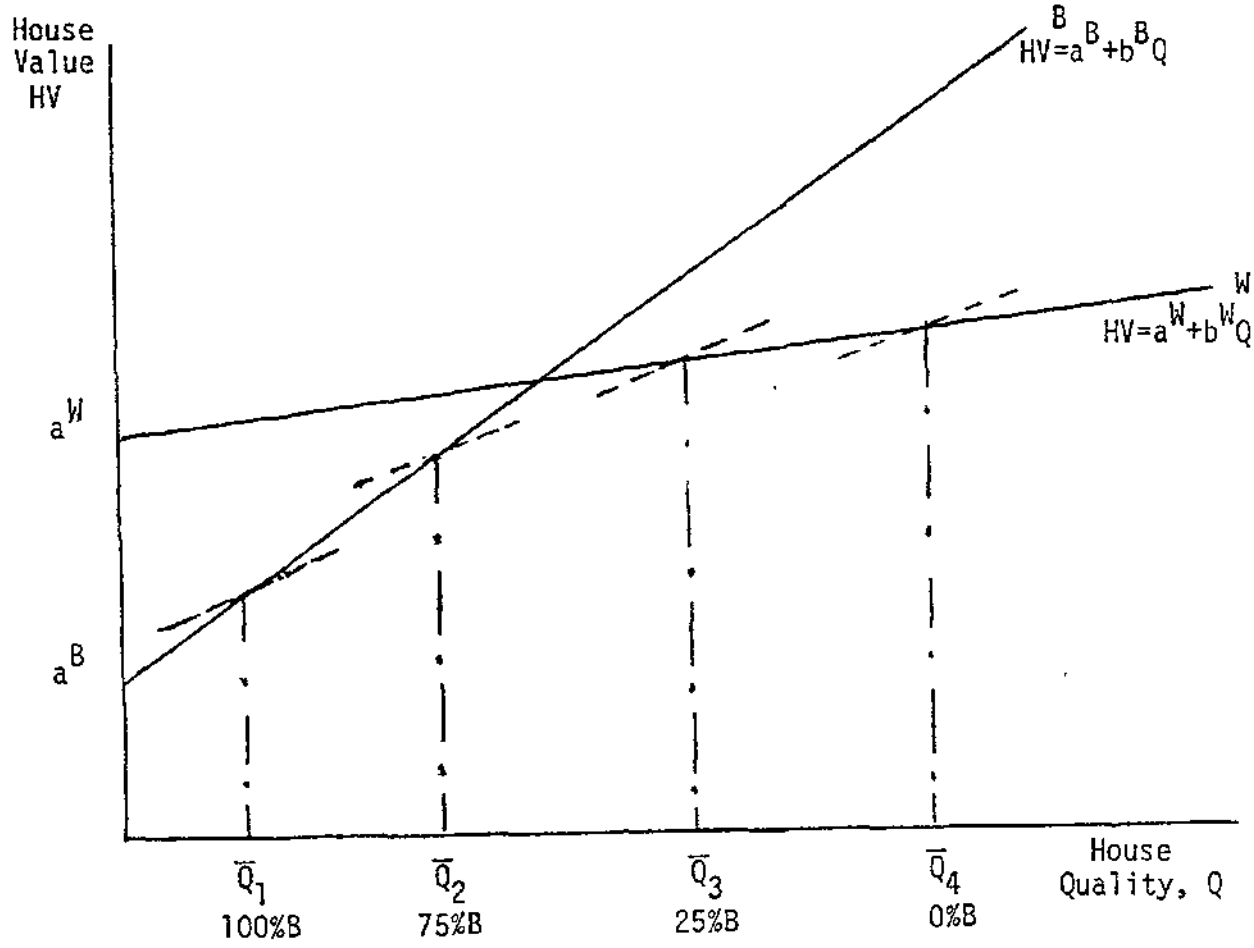
[1] It should be noted that differences in $(\bar{Q}^W - \bar{Q}^B)$ can result from how the sample was constructed or from differences in the income distributions between racial groups.

FIGURE 2

Single House Value Equation
with Percent Black included as
an Independent Variable



Key: _____ Actual Black and White House Value Functions

– – – – – Estimated House Value Functions with Continuous Race Variable ($HV = a \cdot \%B + \overline{b} \cdot Q$)

As shown in Figure 3, if $\bar{Q}^B$ is used in making comparisons, Whites would be shown to pay more. That is, $\overline{HV}^B < \overline{HV}^W$, where the latter is estimated by evaluating the White equation at the Black consumption mean $\bar{Q}^B$. The "price" differential is estimated to be $\overline{AB}$ as shown in Figure 3.

On the other hand, if $\bar{Q}^W$ were used as the basis of comparison, then the "price" differential would indicate that Blacks pay more by $\overline{CD}$. Lapham obtains similar conflicting results, where the sign of the price differential changes when alternative housing bundles are used to evaluate estimated house values. However, in either case the differentials she finds are not statistically significant.

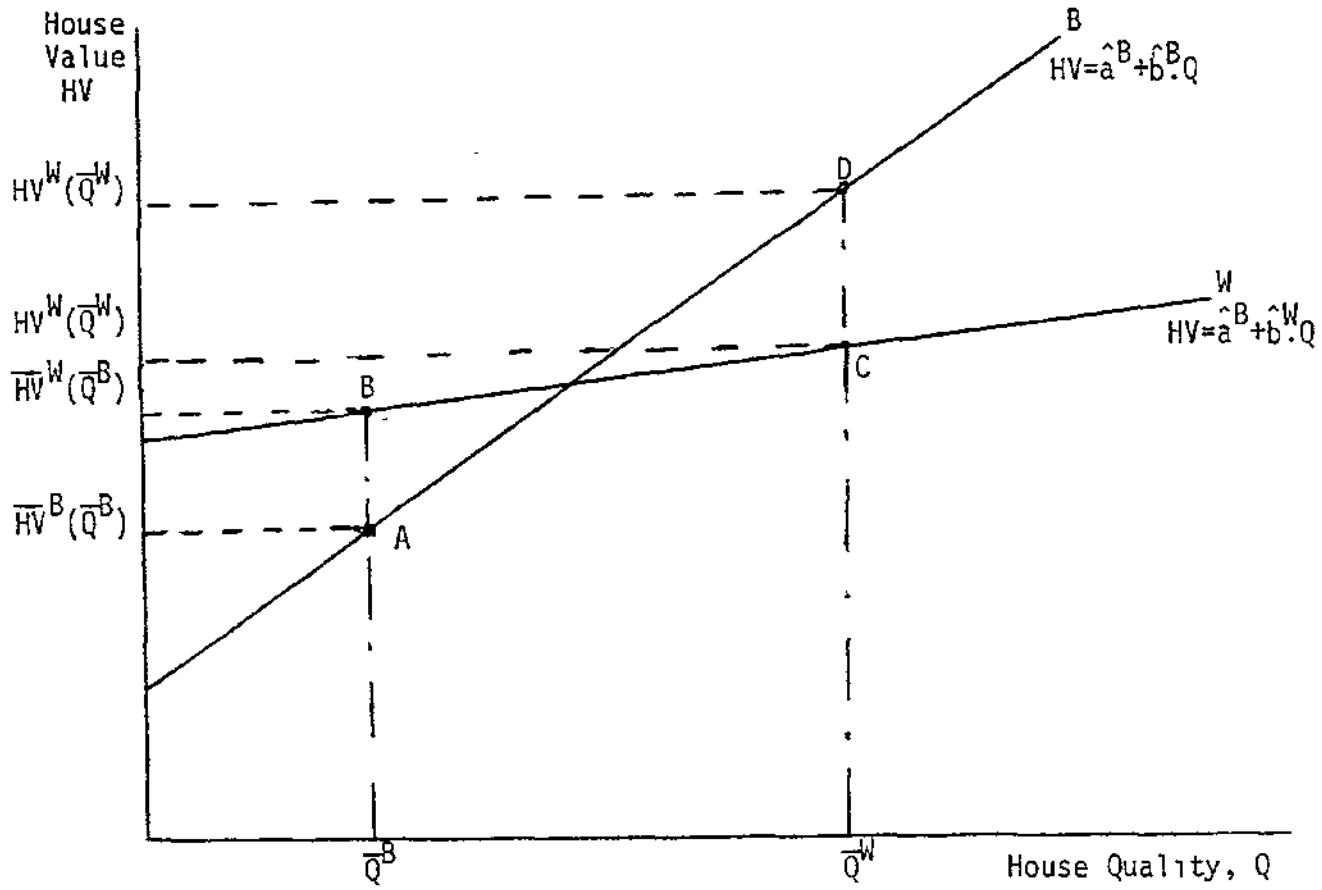
In summary, we find that with the use of a Black/White dummy variable any sign can be obtained (including insignificant coefficients) depending primarily upon the gap between $\bar{Q}^B$ and $\bar{Q}^W$. The sign on the coefficient of the variable %B also depends upon the gap between $\bar{Q}^B$ and $\bar{Q}^W$ and upon the extent that the sample includes a full range of areas of differing racial composition. If the latter requirement is fulfilled, the likelihood is quite high that a quadratic fit, as was used by Schnare, will be statistically significant.

Schnare finds that in 1960 the lowest prices for housing were in "integrated" areas. This suggests that the price functions may be reversed from those described in Figure 1 to 3, where instead $\underline{a}^B > \underline{a}^W$ and $\underline{b}^B < \underline{b}^W$. These functions are shown below in Figure 4.

To many this set of price structures has an intuitive appeal. One set of hypotheses suggested by this structure of prices is that $\underline{a}$ is higher for Blacks because of restricted supply in segregated areas and $\underline{b}$ is lower

FIGURE 3

Comparisons of Expected House Values
from Separate Estimating Equations where
Price Differentials are Evaluated with
Alternative Bundles

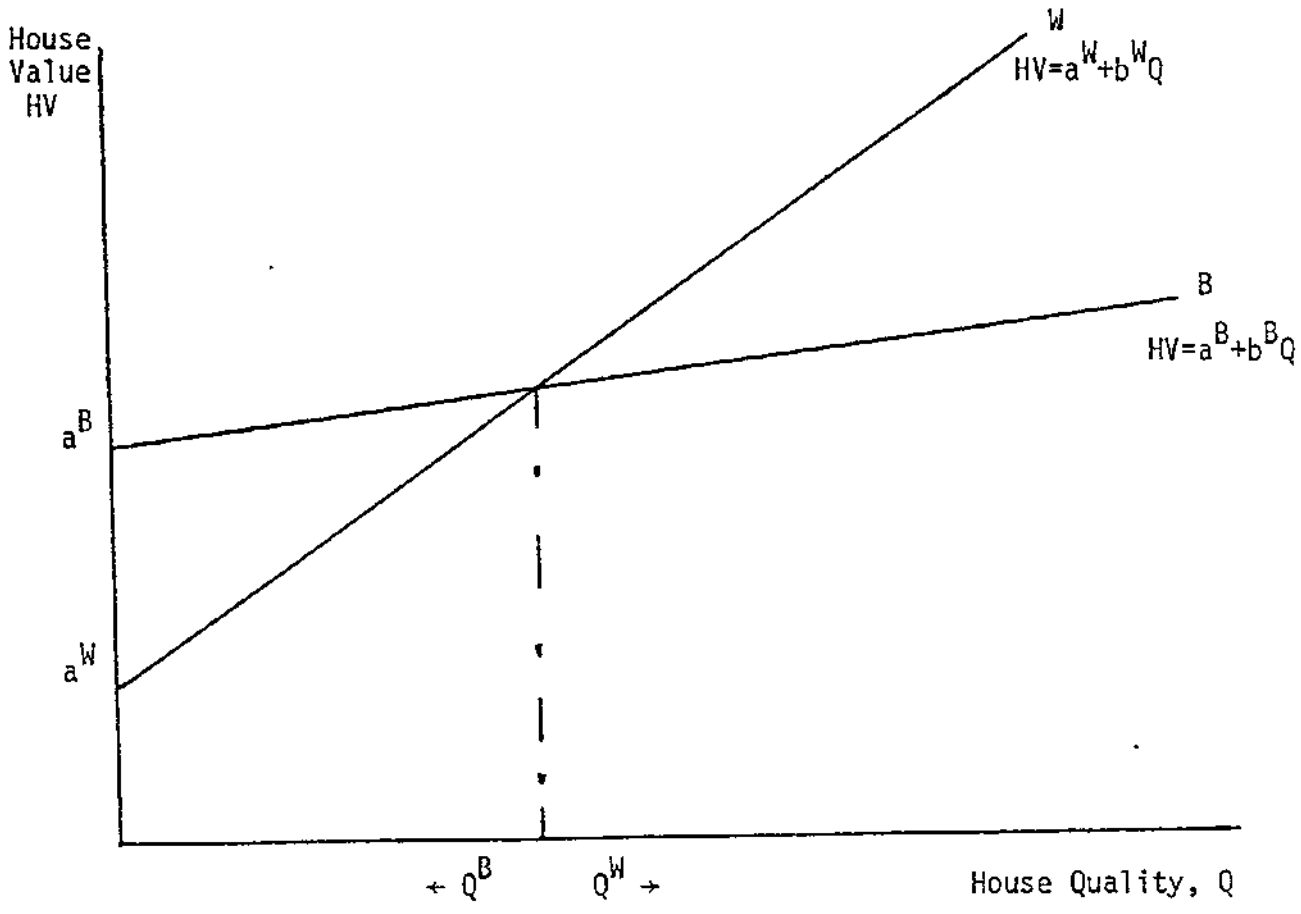


Key: _____ Actual and Estimated Black and White House Value Function

($HV(\bar{Q})$ is equal to the expected house value obtained from the estimated house value equations evaluated at same level of housing services, $\bar{Q}$)

FIGURE 4

Alternative Structures of
House Prices Faced by
Blacks and Whites



Key: _____ Actual Black and White House Value Functions with $a^W < a^B$ and $b^W > b^B$.

because the lower incomes of Blacks generate a lower demand for Q. However, such a pattern is also consistent with segregation and "price" differentials in the absence of explicit discrimination or exclusion of any kind. Blacks merely outbid others for housing (the level of Q) they can afford. Whites with higher incomes simply do not consider the initially lower qualtiy housing at the price Blacks are willing to pay, even if the property could be upgraded. Conversely for higher quality units, Whites outbid Blacks. Given the geographic distribution of housing by quality, the result of both household types simply maximizing their utility could lead to a form of de-facto segregation.

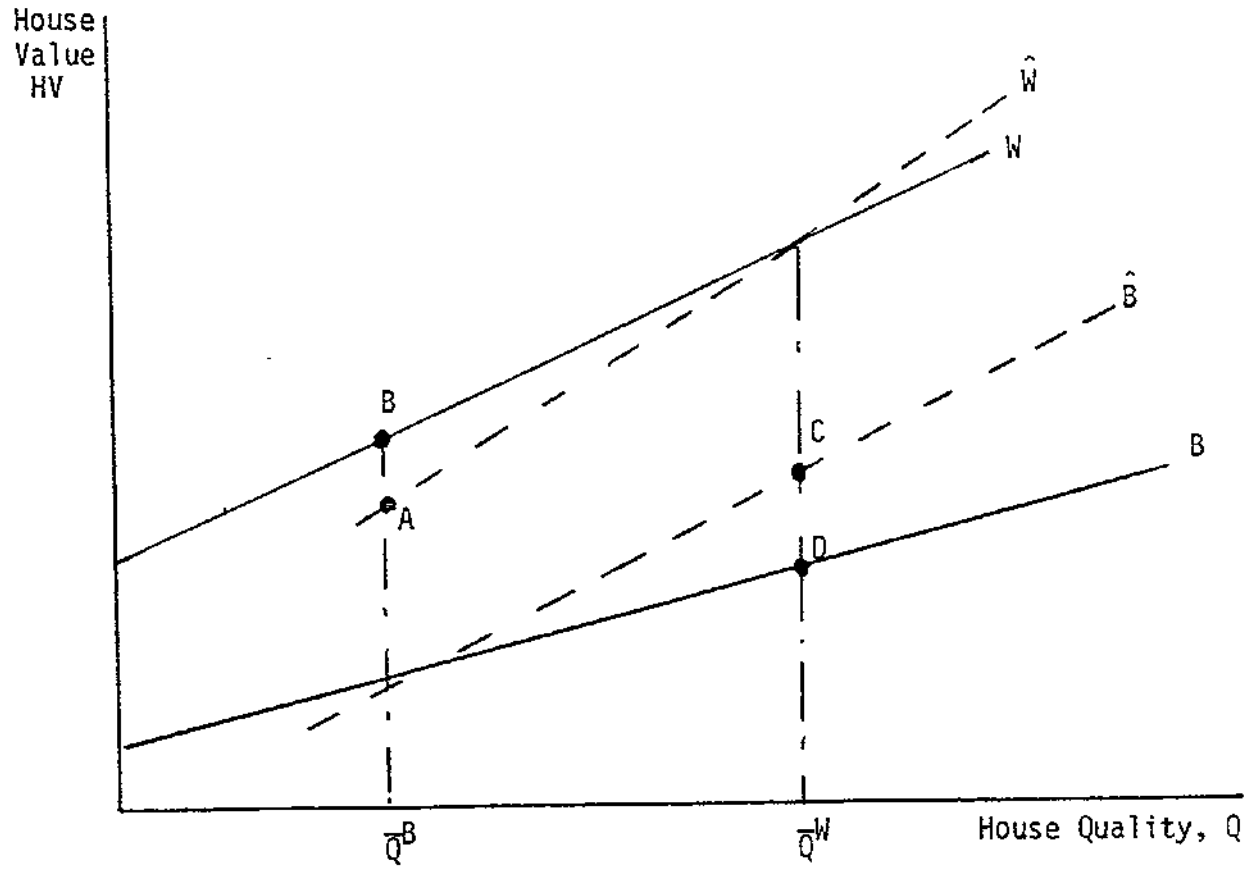
If the curves look like those shown in Figure 4, then all of the comments in earlier paragraphs are still relevant except that the signs will, in general, be opposite. With the use of (%B) and $(\%B)^2$, the quadradic will have a minimum rather than a maximum. In either case a very wide range of results can be obtained from alternative empirical specifications, even from the same basic price structures.

(c) Unambiguous ranking of both price components.

The primary source of the problem discussed above stems from the ambiguous situation where $\underline{a}^W < \underline{a}^B$ and $\underline{b}^W > \underline{b}^B$. However, problems still exist if both price terms differ in the same direction. Consider the situation where $\underline{a}^W > \underline{a}^B$ and where $\underline{b}^W > \underline{b}^B$. The HV functions look like those shown in Figure 5. If a Black/White dummy variable is used in estimating a single HV equation which constrains $\underline{b}^W = \underline{b}^B$, the estimated price differential will be biased. As shown in Figure 5 the differential will be under-

FIGURE 5

House Value Equations
with
Unambiguous Rankings



Key: _____ Actual Black and White House Value Functions

_ _ _ _ _ Estimated House Value Functions with Dummy Variable

estimated by at least the amount $\overline{AB}$ and by as much as the amount $\overline{CD}$. Similarly the use of %B as an independent variable is also likely to produce biased results. In both cases, however, the sign (direction) of the differential will always be correct.

The use of separate regressions will also indicate Blacks pay less given the structure of prices depicted in Figure 5. However, the magnitude of the differential will differ significantly depending upon the housing bundle used to make the comparison. The price gap using $\overline{Q}^B$ will always be smaller than the gap when $\overline{Q}^W$ is used as can be seen from Figure 6. This in part explains why in the Kain and Quigley work the price differentials range wildly from 1 to 50%.

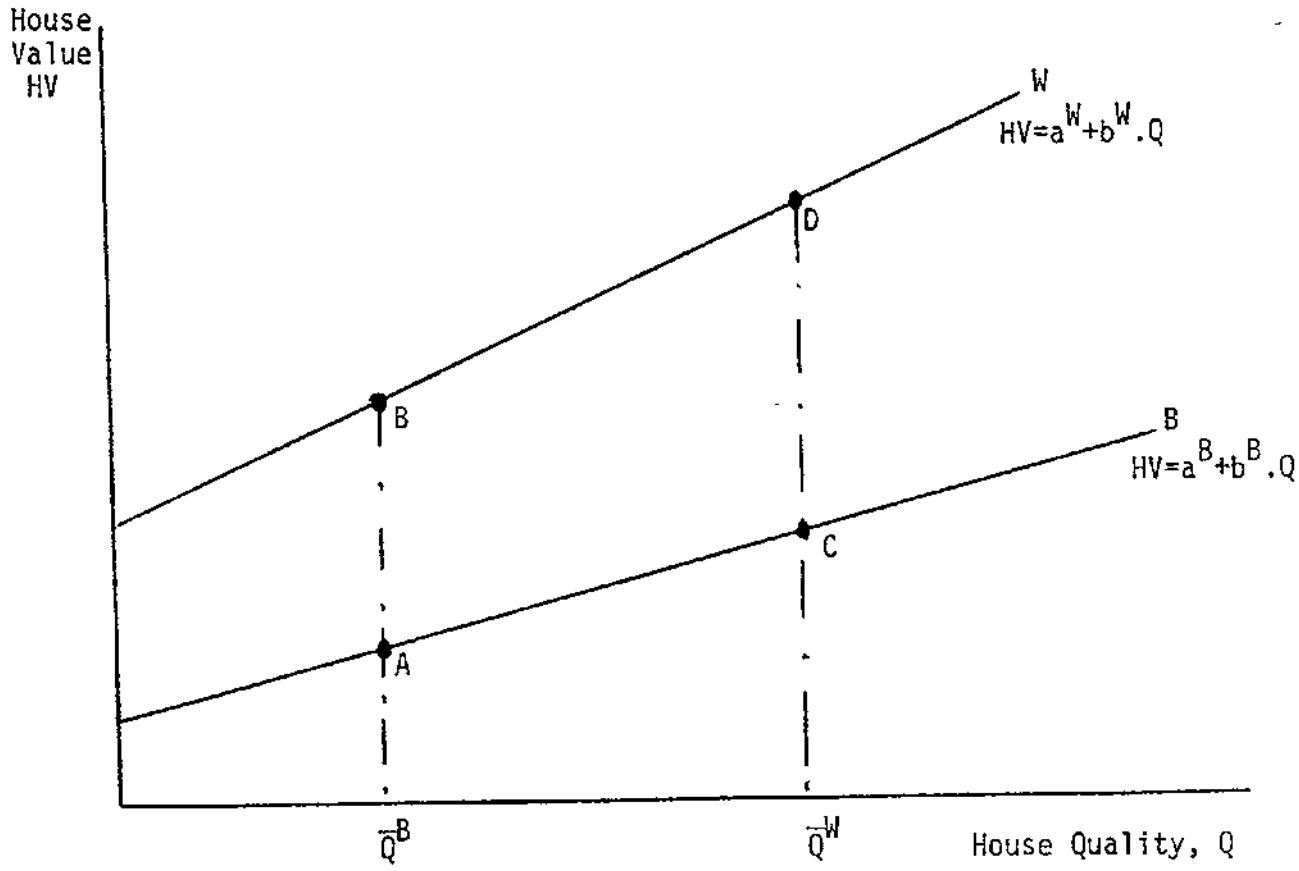
It can be concluded then that, almost without exception, past estimates of price differentials are flawed by failure to appreciate the dual nature of housing prices and the extent that the use of different methodological techniques can alter the so-called "price" differentials which analysts have attempted to measure. This problem alone may explain much of the confusion that exists with regards to the empirical results currently in the literature. Furthermore, in ignoring the basic differences in both a and b, past studies fail to provide all the requisite information to make inferences about discrimination and its effect on Blacks in segmented housing markets.

Other Issues:

Two additional issues of interest involving the estimation of price differentials require further comment. One involves additional refinement

FIGURE 6

Comparisons of Expected
House Values where House Value
Equations are Unambiguously Ranked



Key: _____ Actual and Estimated Black and White House Value Equations

of the concept of price, and the other concerns empirical questions with regards to the correct hedonic specification.

(a) The effective price of housing.

If housing is thought of as an investment good as well as consumption good, then the effective price of a home must take into account the expected rate of return to home ownership. Ignoring, at this point, various tax advantages to ownership, a purchaser of a home receives an annual rate of return on that home by way of appreciation of value. This return is a benefit stream beyond the annual yield of housing services he consumes. Thus, holding quality constant, a positive correlation would be expected between the price of a home and its expected rate of appreciation. Therefore, two homes of equal value ($P \cdot Q$) and of the same quality (Q), but with different appreciate rates, $d\overset{*}{P}$, will have different effective prices. In other words, if $d\overset{*}{P}_1 > d\overset{*}{P}_2$, then P_1 must be greater than P_2 <u>for the effective price of housing to be the same</u>.

Suppose then that <u>at any point in time</u> the price paid by Whites and Blacks does not significantly differ. If homes in White areas are appreciating at an annual rate of 10% and those of Blacks are appreciating at only 4%, then with $P^W = P^B$, Blacks must be actually paying more in terms of the "effective price" of housing. This suggests that to completely investigate differentials in housing prices faced by Blacks, rates of house price appreciation also need to be examined.

(b) The specification issue.

The specification issue is considerable more complex than the problem of controlling for different appreciation rates. It basically involves the question of just how differences in neighborhood quality are capitalized into housing prices. In part the discussion above, concerning the dual nature of house prices, touches upon the issue. However, in many studies neighborhood amenity variables are included in the empirical estimation. Whether the value of neighborhood amenities is separable in the estimating equation or whether it merely effects the marginal values of structural attributes of housing is a matter of debate. Diamond (1980) and Diamond and Smith (1980) provide one of the best theoretical frameworks to answer the question. However, the answer is not at all simple.

If hedonic equations are estimated over a set of neighborhoods where the population is relatively homogeneous in terms of characteristics that effect housing demand, then a separable specification including the values of neighborhood amenities along with the value of the structure may be appropriate. One can either estimate a house value equation with both structure and neighborhood attributes together in some linear form or if the variance in neighborhood attributes is small within sub-areas, separate equations can be estimated for each area including structural characteristics only.

If the sample includes housing occupied by a broad heterogeneous population, then a specification allowing for interaction between structure and neighborhood values is apt to be required. One such specification is found in King and Mieszkowski (1973) who use both semi-log specification and interaction terms with the neighborhood variables. The issue is to some extent an empirical one. However, because incorrect specifications of the

house value equation can lead to biased estimates of price differentials due to race as well as to biased estimates of the "value" of neighborhood amenities, it is felt that given any particular data set, alternative specifications should be applied to examine the robustness of estimated price differentials to alternative specifications.

The Analytic Approach Used

The basic approach followed in this research involves the separate estimation of hedonic equations by neighborhood type. For Chicago, areas are defined as Black, Expansion, Border and White Interior. This corresponds to the exact neighboborhood definition used by Berry (1976), so that a direct comparison with his results can be made. In Houston, areas are defined as Black (65% Black or more), Integrated (5 to 64% Black), Border Transition (White areas on border where Blacks are expected to move in), Border Non-Transition (White border areas where the status quo is likely to remain the same) and White Interior areas.[1] In the Houston case the areas are defined at the block level of resolution.

Because of the way the areas are defined in both cities, the variances in the neighborhood characteristics are quite small. Consequently, most neighborhood variables prove insignificant in the subsample regressions. Thus, in the final specifications each neighborhood regression includes only structural characteristics variables. However, an equation for the entire metropolitan area with the neighborhood variables included is estimated in

[1]See Section II for some additional details with respect to the definitions of the Houston submarkets, especially in regard to Border Transition and Non-Transition areas.

order to obtain "rough" measures of the implicit prices or values of key neighborhood amenities. This procedure, whereby structural variables are only used for the separate neighborhood regressions, helps to avoid the difficult specification problem with regards to the interaction of structure and neighborhood characteristic variables. The King and Mieszkowski approach was attempted as an additional check on the appropriateness of this approach. For the most part, similar results were produced.

The question of the dual nature of housing prices is addressed by examing the difference in both a and b for each set of neighborhood comparisons. In addition, price differentials are made using both consumption bundles $\overline{Q}^B$ and $\overline{Q}^W$ as the basis for comparison. In application, differences in the value of housing between areas is decomposed into differences attributable to the shift coefficients (the constant), differences in the slope coefficients, and differences in the attributes of the housing in each area. The so-called constant (shift) plus coefficient (slope) effects provide one measure of the overall price differential between areas.

The basic relationship estimated is

$$(1) \quad HV_i^k = \beta_o^k + \Sigma\beta_i^k X_{ij}^k + \mu_i^k$$

$$i = 1 \text{ to } n$$

where HV_i^k is the value of the $i^{\underline{th}}$ house located in the $k^{\underline{th}}$ area and the X_{ij}^k are the structural characteristics of each house. For each neighborhood type, this equation is separately estimated. From the different subsample estimates the differential in the expected house value in any two areas, $(\overline{HV}^1 - \overline{HV}^2)$, is broken down into three categories: that portion captured

by differences in the constants ("the shift coefficient"); that attributable to differences in housing attributes, the $\bar{X}_i$'s; and that attributable to differences in the subarea coefficients, the β_i's.

In particular, differences between the White area and the Black area are broken down as follows:

the attribute effect,

$$(2) \quad \Sigma_i \beta_i (\bar{X}_i^W - \bar{X}_i^B),$$

the coefficient effect,

$$(3) \quad \Sigma \bar{X}_j^\beta (\beta_i^W - \beta_i^B),$$

and the constant (shift coefficient) effect,

$$(4) \quad \beta_o^W - \beta_o^B$$

It can easily be shown that the sum of these three effects equals $(\overline{HV}^W - \overline{HV}^B)$, the average (or expected) differential in house values between the two areas. In the empirical results presented below each of these three partial effects is isolated. As previously mentioned the sum of the coefficient and constant (shift coefficient) effect is considered the "price" differential after controlling for quality differences.[1]

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[1] This overall price differential is essentially the differential in "average prices" between areas. To obtain information on the differences in either marginal prices, b_i, or in the lump sum price, a, the individual components must be examined separately. It should also be noted that because of the exponential specification used for most regressions, the coefficients, as well as the constant and coefficient effects need to be interpreted with care. For example, as presented in the text to follow, the coefficient effect actually measures differences in the percent marginal price of various housing characteristics.

However, each individual effect, which is equivalent to Δa and Δb as discussed above, is also analyzed separately.

Findings

(a) Data

A semi-log specification of equation (1) is estimated using similar data from both Chicago and Houston. The housing data, including market prices and a host of structural characteristics, were obtained from quarterly listings published by the Society of Real Estate Appraisers. Additional data on distance to key work centers, demographic characteristics of the area where each home is located, and key neighborhood attributes obtained from census data and other local sources were added to each SREA observation. Data on crime by police districts were obtained for both Chicago and Houston from their respective Police Departments. However, Houston police districts are so large and encompass such heterogeneous areas that the crime data were found to be virtually useless in hedonic estimations.

The Chicago file contains 1917 observations grouped into 4 areas that correspond exactly to those used by Berry (1976): (1) all White; (2) White/Black border; (3) Recent Black Expansion; and (4) Black Interior. The 3736 observations obtained for Houston are grouped into five areas: (1) White; (2) Integrated; (3) Border/Non-Transition; (4) Border/Transition; (5) Black. The Chicago data is for transactions for 1972. The Houston data is for transactions in 1977. In addition, 2112 Houston observations for 1970 are grouped into the same Houston subareas in order to estimate differences in rates of appreciation between these areas over time

as well as cross-sectional differences in housing prices at a single point in time.

(b) Empirical results: Chicago

Tables II[a] and III[a] present the regression results for the Chicago data using the entire sample. The regression reported in Table II[a] includes only structural characteristics of the housing. Table III[a] reports the regression results for which neighborhood variables are added. Included among these additional explanatory independent variables are four primary neighborhood characteristics or amenity variables: distance to the CBD, neighborhood pollution levels, per student expenditure in neighborhood schools, and local area crime rates. Finally, as shown in the second column of Table III[a], variables based on racial composition of each area are included in the estimating equation.

All three OLS regression estimates have respectable R^2's, all coefficients have the correct sign, and most coefficients are statistically significant. The coefficients of the neighborhood variables indicate that housing prices are lower in Black areas. This is consistent with Berry's (1976) results. However, the lowest prices are found in the White area bordering the Black neighborhoods. Though these results differ from Berry's, definitive conclusions should be avoided at this point since the probability of specification error with the use of neighborhood dummy variables is quite high.

The products of the coefficients of the neighborhood amenity variables and mean house value ($\beta_i \cdot \overline{HV}$) are taken as the "overall implicit

market prices" for these attributes. As such, they represent equilibrium market prices at the margin for those attributes and are not necessarily their marginal value to any particular demographic group. However, as an overall rough estimate of market-wide marginal values, they are used later to estimate the "expected" differences in housing prices between the 4 designated neighborhood areas.

Table IV[a] presents the results of the separate OLS regression estimates for each neighborhood area. Again each subsample regression has a respectable R^2, though a few coefficients have incorrect signs or are insignificant. The neighborhood variables are deleted here because the variance in these characteristics across these more narrowly defined areas is minimal, making estimation of the implicit values within the separate areas impossible.

Following equation (2) through (4), Table V[a] provides a breakdown of the attribute, coefficient and constant effects associated with the Border, Black Expansion, and Black areas as compared with the White Interior submarket. Since the basic specification of equation (1) is semi-log, in order to estimate in percentage terms the actual differential in prices, the exponential of the "price difference" estimates (.112, .141, and .193) must be calculated. The results shown in Table VII[a] are 11.9%, 15.1%, and 21.3% respectively. Thus Table V[a] and VII[a] indicates that housing prices fall monotonically with closeness to the Black interior. (The positive sign indicating that Whites pay more.) These results are reasonably consistent with Berry's (1976) findings, though the Black expansion area does not show an increase (or partial recovery) in prices.

In general both the White constant, a, and the White slope coefficient, b, are higher than for other areas, although the coefficient effect (differences in the b's) dominates the White/Black Expansion comparison. It is also of interest to note that Blacks pay slightly more for large lots, fireplaces, and to some extent interior space. However, Blacks save less by purchasing older housing or, in other words, Whites pay more for younger housing.

Table VI[a] takes the implicit shadow prices of neighborhood characteristics in each area and calculates the implicit value of housing attributable just to those characteristics. The bottom line on Table VI[a] simply standardizes the differences between neighborhood areas with respect to the White Interior area. The exponential of these coefficients shows that prices in the Border, Black Expansion, and Black area are expected to be 5.2%, 20.3%, and 22.6% lower respectively due to inferior neighborhood characteristics (e.g., higher crime, inferior schools, greater pollution, and poorer accessibility).[1]

Table VII[a] compares the estimated price differentials between neighborhoods (excluding the effects of neighborhood amenities) with the "expected" price differential accountable to differences in the four primary neighborhood characteristics. Of the 11.9% differential between the White and Border areas, almost half can be explained by differences in neighborhood attributes. On the other hand, housing prices in Black Expansion and in Black areas are actually higher than would be expected because of inferior

[1] In actuality, Blacks fair better in Chicago with respect to accessibility and Black areas have only slightly inferior schools. However, Black areas have significantly higher pollution levels and crime rates.

TABLE II[a]

CHICAGO RESULTS

OVERALL MARKET EQUATION
WITH STRUCTURAL CHARACTERISTICS ONLY
(DEPENDENT VARIABLE, HOUSE VALUE)

INDEPENDENT VARIABLES	s_i	$\bar{X}_i$
AGE	-.0086 (597.2)	33 7
SQ. FEET	.0145 (127.5)	13.3
BRICK	.1033 (74 6)	.712
ROOMS	-.0065 (1.7)	5.94
BATHS	.0493 (13.5)	1.23
BASEMENT	.1141 (21.2)	.969
MODERNIZE	0223 (37.5)	1.13
AIR COND	.1380 (118.2)	.157
FIREPLACE	.0540 (24.5)	.168
GARAGE	.0292 (33.1)	1.25
LOT SIZE	.0279 (119.3)	4 78
CONDITION	.0058 (1.4)	2.53
CONSTANT	5.0656	
	R^2=.628 N=1917	

*F statistics are provided beneath each coefficient.

TABLE III[a]

CHICAGO RESULTS

"MARKET EQUATION" REGRESSION RESULTS
WITH NEIGHBORHOOD CHARACTERISTICS
(DEPENDENT VARIABLE, HOUSE VALUE)

INDEPENDENT VARIABLES	X_i	β_i	β_i
AGE	33 7	-.0072 (562.8)	-.0071 (505.8)
SQ. FEET	13.3	0161 (229.6)	.0159 (207.3)
BRICK	.712	.1061 (108.7)	.0993 (88.6)
ROOMS	5 94	.0111 (7 4)	.0092 (4 6)
BATHS	1.23	.0508 (21.3)	.0441 (14.9)
BASEMENT	.969	.1556 (58.8)	.1455 (47 6)
MODERNIZE	1.13	.0175 (34.2)	0202 (42.6)
AIR COND	.157	.1173 (126 1)	.1205 (122 9)
FIREPLACE	168	.0613 (46.2)	.0536 (33.1)
GARAGE	1.25	.0248 (35.3)	.0233 (28 9)
LOT SIZE	4 78	.0163 (52.3)	0151 (42 0)
CONDITION	2.50	.0075 (3 4)	.0072 (2.9)
DIST. TO LOOP	10.3	-.0085 (24.4)	-.0128 (57 2)
POLLUTION	10.8	- 0075 (3.7)	-.0015 (20.1)
SCHOOL $	5 47	.0724 (37 4)	0809 (46 0)
CRIME	8.53	-.0159 (235.1)	-.0182 (364 6)
BLACK EXP	.483	-.0812 (38.3)	----
BORDER	.149	-.1505 (156 5)	----
BLACK	.116	- 1070 (39 3)	----
CONSTANT		4.8973	4 9682
		R^2= 753 N=1917	R^2=.732 N=1917

*F statistics are found beneath each coefficient

TABLE IV[a]

CHICAGO RESULTS

REGRESSIONS FOR FOUR
SEPARATE NEIGHBORHOOD TYPES

	WHITE		BORDER		BLACK EXP.		BLACK	
	β_i	$\bar{Y}_i$	β_i	$\bar{Y}_i$	β_i	$\bar{Y}_i$	β_i	$\bar{Y}_i$
AGE	-.0092 (111 4)	19.6	- 0074 (110.1)	26.6	-.0082 (379.4)	37.9	- 0080 (113 0)	35.1
SQ. FEET	.0196 (20 0)	11.9	.0205 (39.9)	14.1	0103 (76 5)	12.6	0211 (45 4)	13 8
BRICK	.0757 .(9 4)	867	.1973 (47 9)	.836	.1040 (66 6)	.611	- 116 (16.4)	.838
ROOMS	0275 (7.5)	5.37	0218 (4 0)	5.92	.0316 (34 2)	6 24	.0051 (0.2)	6 05
BATHS	.0394 (1.7)	1.17	.0288 (1.2)	1 33	0369 (6.3)	1.23	0296 (1 3)	1.29
BASEMENT	.1818 (51 3)	.900	.0650 (1.7)	972	.1342 (18.4)	.978	.1196 (2 3)	987
MODERNIZE	.0096 (2 3)	.693	- 0039 (0 3)	762	0071 (3.3)	1.26	- 0075 (0.9)	1.06
AIR COND.	0782 (22.7)	307	.0726 (13 4)	.231	.2144 (179 1)	.119	.0135 (0.2)	.108
FIREPLACE	0359 (3.0)	195	0714 (17.6)	.343	0519 (16.4)	.125	.514 (5 0)	198
GARAGE	0404 (19 5)	1 30	.0335 (10 1)	1 40	.0238 (19.8)	1.21	.0157 (2 2)	1 20
LOT SIZE	0209 (18 3)	5 37	.0121 (9 4)	5.55	0270 (77 6)	4 57	.0335 (23 2)	4 48
CONDITION	.0923 (7.2)	2 63	.0269 (7.4)	2.51	.0038 (0.6)	2.53	0434 (10.5)	2.68
CONSTANT	4 8580		4.8060		4.8494		4.7360	
	R^2= 730 N = 241		R^2=.778 N = 248		R^2= 762 N = 925		R^2= 788 N = 222	

*F statistics are in parentheses

TABLE V[a]

CHICAGO RESULTS

COMPARATIVE ANALYSIS
WHITE WITH 3 OTHER NEIGHBORHOODS

	WHITE-BORDER		WHITE-BLACK EXPAN		WHITE-BLACK	
	ATTRIB EFFECT	COEFF EFFECT	ATTRIB EFFECT	COEFF EFFECT	ATTRIB EFFECT	COEFF EFFECT
AGE	.064	- 048	.168	-.038	.142	-.042
SQ. FT	-.042	-.013	- 031	.126	- 037	-.021
BRICK	.002	-.102	.019	- 017	.002	- 034
ROOMS	-.015	.034	- 022	-.025	- 019	136
BATHS	-.007	.014	- 003	.003	-.005	.013
BASEMENT	-.013	.114	-.014	.047	-.016	.061
MODERNIZE	-.001	.010	-.005	.003	- 004	.018
AIR COND.	.006	.001	015	-.016	.016	.007
FIREPLACE	-.005	-.012	.003	-.002	-.0001	- 003
GARAGE	-.004	.009	.004	.020	.004	.029
LOT SIZE	-.004	.049	.017	- 028	.019	-.056
COND.	.004	.006	.004	064	- 002	- 038
	-.014	+.060	+.156	+.132	+.096	+.072
CONSTANT DIFFERENCE		+ 052		+ 009		+ 121
"PRICE DIFFERENCE"		+ 112		+ 141		+.193
TOTAL DIFFERENCE		+.098		+.297		+ 289

TABLE VI[a]

CHICAGO RESULTS

PRICE DIFFERENTIALS DUE TO NEIGHBORHOOD FACTORS

	NBHD COEFFICIENTS FOR MARKET EQUATION	WHITE		BORDER		BLACK EXP.		BLACK	
	β_1	$\bar{X}_1$	$\bar{X}_1\beta_1$	$\bar{X}_1$	$\bar{X}_1\beta_1$	$\bar{X}_1$	$\bar{X}_1\beta_1$	$\bar{X}_1$	$\bar{X}_1\beta_1$
DIST. LOOP	-.0128	11.950	-.153	11.690	-.149	10.240	-.131	8.920	-.114
POLLUTION	- 0513	9.320	-.144	4 940	-.154	11.640	-.180	11.950	-.185
SCHOOL	+.0809	5.693	.460	5.618	454	5.299	428	5 471	.443
CRIME	-.0182	2.963	-.054	5.098	-.093	10.583	-.192	12.194	-.239
INCREMENT DUE TO NEIGHBORHOOD			+ 109		+.058		-.075		-.095
DIFFERENCE COMPARED TO WHITE AREA			.000		-.051		- 182		-.204

TABLE VII[a]

CHICAGO RESULTS

PRICE DIFFERENCES BETWEEN NEIGHBORHOODS

AREA COMPARISON	ESTIMATED "PRICE DIFFERENCES"	EXPECTED PRICE DIFFERENCES DUE TO NEIGHBORHOOD CHARACTERISTICS
WHITE/BORDER	-11.9%	-5.2%
WHITE/BLACK EXP.	-15.1%	-20.2%
WHITE/BLACK	-21.3%	-22.6%

neighborhood attributes. In either case, however, the difference is not statistically significant. Consequently while it appears that Blacks actually may pay less for housing, for the most part, they do so because they purchase housing in inferior neighborhoods.

(c) Empirical results: Houston.

Tables II[b] through VII[b] are constructed similarly to those for Chicago. The primary difference is that the specification of equation (1) is somewhat different. There are five designated neighborhood types and crime is not included as an independent variable in the overall market equation presented in Table III[b]. It also should be noted that while the "quality" of housing between neighborhood types does not differ significantly in Chicago, in the Houston sample the average housing bundle in White areas as compared to the other locations is far superior. In general the regressions estimated fit the Houston data somewhat better. R^2's and F statistics are generally higher.

The dummy variables for the different neighborhood areas indicate a monotonically decreasing relationship between housing prices and nearness to the Black interior areas. The price differences obtained from the results displayed in Tables IV[b] through VII[b] show that housing prices in Black areas are approximately 21% lower than housing prices in White areas. Prices in Integrated, Border/Transition and Border/Non Transition areas are 16%, 10% and 7% lower respectively. One anomoly is that in integrated areas the coefficient effect is negative, indicating that Blacks pay more for housing because of substantial changes in coefficients of the

HV function. This is due primarily to the higher percentage marginal price for interior space (number of rooms) and exterior space (lot size). For most other comparisons, however, the coefficient effect is positive and, in general, is the dominant factor responsible for the overall price differences. Also, in further contrast to the Chicago results, Blacks in Houston gain less than Whites by purchasing older housing and pay more for larger lots.

Table VII[b] summarizes the results and again compares the price differentials with the expected differentials after neighborhood attributes are taken into account. These results are startlingly similar to those found for Chicago. The Houston Black/White differential of 21% is virtually identical (at least to the nearest percentage point) to Chicago's 21% differential. The other neighborhood comparisons between the two cities are also quite similar, especially after taking into account the fact that these other neighborhoods are defined somewhat differently. Furthermore, as is the case for Chicago, most of the price differences can be explained by neighborhood factors. In Houston the "expected" price differentials usually exceed slightly the estimated differentials. The largest gap is for the White/Border Transition comparison where the expected differential is 18.5% while the estimated differential is only 10.2%. To some extent then, it can be concluded that after accounting for differences in neighborhood quality, Blacks actually pay more for housing (though the differences is not statistically significant). From another perspective, it could be concluded that Blacks pay less for housing (the structural aspects of housing) but are paying more for neighborhood (that is, interior

areas in which many Blacks live are not sufficiently discounted).

(d) Differential in the "Effective Price" of housing.

Using the same basic technique as applied cross-sectionally, rates of appreciation by neighborhood type were also calculated for the Houston metropolitan area. All areas in Houston experienced significant annual housing appreciation as is shown in Table VIII. Black areas, in general, appreciated at a rate that was between 20-45% lower than White areas. Thus, to the extent that Black prices, after adjusting for neighborhood differences, are similar, then the "effective price" Blacks are paying for housing is much more than that paid by Whites. In addition, these results, indicating that the prices paid by Blacks for housing structure are increasing less rapidly than in White areas, suggest that the Black/White price differential or price gap is widening over time. To some extent this is to be expected if the "effective price" in White areas is too low. However, whether this phenomenon is due to temporary disequilibrium requiring price adjustments or whether this is due to an expectation of continuing decline in neighborhood quality in Black areas relative to White areas requires further investigation.

Summary of the Chicago and Houston Results

The empirical results presented above indicate that for both Chicago and Houston, Blacks pay less for housing (the structural characteristics). The differential seems to increase steadily from border to integrated to dominately Black areas. However, the price differential between

neighborhoods within the two metropolitan areas differs in its composition. While in some cases the constant effect, the difference in a, dominates in the overall price effect, other comparisons (between neighborhoods) show a coefficient effect, the difference in the percentage marginal price of housing attributes, b, to be equally, if not more important. Comparisons using either $\bar{Q}^B$ or $\bar{Q}^W$ indicate that Blacks pay less, though the magnitude of the differential does change (quite significantly for a few comparisons).[1]

While the results indicate that housing prices for areas either threatened by Black immigration or with substantial Black population are lower, it is shown that differences in accessibility, school quality, crime rates, and pollution level could by themselves account for the difference in price. In essence, it appears that Blacks do pay less for housing, but they get less quality neighborhoods which accounts for the differential.

On the other hand, while Blacks may pay less for housing (structure), it appears more likely that, if there exists any differential, they are likely to be paying more for the entire housing and neighborhood bundle than are Whites. Furthermore, when the investment aspect of housing is considered, Blacks seem to be faring even worse. In terms of the "effective price" of housing, Blacks may be paying substantially more.

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[1]Note that the results presented above suggest that while in general the slope of the White house value function is steeper than the Black function, which indicates that the price differentials would be larger if $\bar{Q}^W$ were used as the baseline bundle, it needs to be remembered that in some cases $\bar{Q}^B$ actually is greater than $\bar{Q}^W$, and that b^B sometimes exceeds b^W.

TABLE II[b]

HOUSTON RESULTS

OVERALL MARKET EQUATION
WITH STRUCTURAL CHARACTERISTICS ONLY
(DEPENDENT VARIABLE, HOUSE VALUE)

INDEPENDENT VARIABLES	β_i	$\bar{X}_i$
KITCHEN MODERNIZATION	.1134 (288.5)	1 36
AGE OF HOUSE	.0084 (72.1)	12.1
AGE OF HOUSE (SQ.)	-.0001 (12.6)	279.
LOT SIZE	.0015 (1.01)	8.74
LOT SIZE (SQ)	0001 (0.22)	105.
NUMBER OF ROOMS	.006 (2.34)	6.68
NUMBER OF BATHS	1126 (96 9)	1 81
SQ. FT. LIVING AREA	.0373 (999 3)	16.4
CONDITION	0567 (172.5)	3 63
CENTRAL AIR	1613 (227.6)	.674
FIREPLACE	.1719 (264.0)	.422
GARAGE X #CARS	.0801 (175.2)	1.58
CONSTANT	1.2451	
	R^2=.823 N =3736	

*F statistics are provided beneath each coefficient.

TABLE III[b]

HOUSTON RESULTS

"MARKET EQUATION" REGRESSION RESULTS
WITH NEIGHBORHOOD CHARACTERISTICS
(DEPENDENT VARIABLE, HOUSE VALUE)

INDEPENDENT VARIABLES	$\bar{X}_i$	β_i	β_j
KITCHEN MODERNIZATION	1.02	.073 (53.1)	.08 (60.0)
AGE OF HOME	18.3	-.005 (8.6)	-.005 (6.0)
AGE OF HOME (SQ.)	467.	.000 (1.9)	.000 (4.0)
LOT SIZE	8.41	.010 (11.7)	.006 (4.2)
LOT SIZE (SQ.)	98.9	-.000 (5.1)	-.000 (1.1)
NUMBER OF ROOMS	6.37	-.019 (9.2)	-.02 (9.0)
NUMBER OF BATHS	1.64	.055 (9.0)	.042 (4.8)
SQ. FT. LIV. AREA	15.2	.047 (397.0)	.050 (411.3)
CONDITION	3.79	.053 (40.0)	.054 (38.8)
CENTRAL AIR	.514	.123 (57.5)	.125 (54.5)
FIREPLACE	.264	.154 (75.4)	.165 (80.0)
GARAGE X #CARS	1.40	.060 (47.0)	.065 (50.9)
POLLUTION	80.3	-.004 (75.8)	-.003 (45.5)
SCHOOL QUALITY INDEX	40.6	.004 (47.9)	.007 (266.2)
DISTANCE TO CBD	7.82	-.035 (125.1)	-.033 (101.3)
BLACK	.140	-.207 (77.5)	
INTEGRATED	.415	-.071 (94.7)	
BORDER/TRANSITION	.527	-.024 (22.8)	
BORDER/NON TRANSITION	.754	-.027 (37.9)	
CONSTANT		5.097	
		R^2=.866 N =1207	R^2=.849 N =1207

*F statistics are found beneath each coefficient

TABLE IV[b]

HOUSTON RESULTS

REGRESSIONS FOR FIVE
SEPARATE NEIGHBORHOOD TYPES

	WHITE		BLACK		INTEGRATED	
	β_i	$\bar{X}_i$	β_i	$\bar{X}_i$	β_i	$\bar{X}_i$
KITCHEN MODERN.	.1043 (180.6)	1.57	.0314 (2 0)	.645	.0164 (10.8)	.970
AGE OF HOME	.0078 (46.7	10.1	-.0076 (2 8)	17.7	-.0076 (8.0)	13 8
AGE OF HOME (SQ.)	- 0001 (14.7)	232.	.0001 (0.9)	428.	.0001 (6 2)	276.
LOT SIZE	.0105 (3.5)	8.76	.0401 (3.4)	7.88	.0460 (6.0)	8.00
LOT SIZE (SQ)	- 0002 (0.8)	85.9	0020 (4.1)	70 1	- 0018 (5 1)	69.7
NUMBER OF ROOMS	0091 (4 6)	6.94	.0122 (0.6)	5.97	.0984 (60.8)	6.20
NUMBER OF BATHS	.1158 (77.1)	1.93	.0148 (0.1)	1.43	.1459 (22.4)	1 57
SQ. FT. LIV. AREA	.0371 (814.5)	17.7	.0507 (67.8)	12.8	.0122 (25.3)	13 6
CONDITION	.0414 (35.2)	3.79	.0220 (4 9)	3.21	0282 (17.2)	3 05
CENTRAL AIR	.1446 (139.2)	.762	.1899 (25.0)	.367	.1188 (22.1)	.573
FIREPLACE	1550 (192.3)	.532	.0802 (2.4)	.131	.2561 (60.9)	.179
GARAGE X #CARS	.0812 (114 2)	1.74	.0726 (13 8)	1.04	.0949 (34.6)	1.43
CONSTANT	4.2880		4.2419		3.9702	
	R^2=.8202 N = 2543		R^2=.7854 N = 259		R^2=.8684 N = 302	

TABLE IV[b] (Cont'd)

HOUSTON RESULTS

REGRESSIONS FOR FIVE
SEPARATE NEIGHBORHOOD TYPES

	BORDER/NT		BORDER/T	
	β_i	$\bar{X}_i$	β_i	$\bar{X}_i$
KITCHEN MODERN.	.1554 (38 1)	.803	.0109 (0.5)	.796
AGE OF HOME	.0020 (0.0)	22.0	-.0022 (0.2)	17.1
AGE OF HOME (SQ.)	.0000 (0.0)	620.	.0001 (0.4)	343.
LOT SIZE	.0335 (3.9)	7.79	.0312 (4.1)	8.03
LOT SIZE (SQ.)	-.0009 (1 8)	68.9	-.0014 (5.6)	71.7
NUMBER OF ROOMS	-.0077 (0.3)	6.27	.0387 (9 5)	5.95
NUMBER OF BATHS	-.0361 (0 7)	1.48	.0853 (7.9)	1.43
SQ. FT. LIV AREA	.0406 (52.4)	14.1	.0363 (53.7)	12.6
CONDITION	.0618 (18 2)	3.48	.0243 (10.2)	3.26
CENTRAL AIR	.1632 (16.1)	.394	.0986 (18.5)	.396
FIREPLACE	.2195 (28.4)	.268	.1454 (6.4)	.034
GARAGE X #CARS	.0354 (3.4)	1.38	.0578 (16.7)	1.17
CONSTANT	4.4061		4 2690	
	R^2=.8489 N = 254		R^2=.8106 N = 378	

*F statistics are found beneath each coefficient.

TABLE V[b]

HOUSTON RESULTS

COMPARATIVE ANALYSIS
WHITE WITH 4 OTHER NEIGHBORHOODS

	WHITE-BLACK		WHITE-INTEGRATED		WHITE-BORD./NT		WHITE-BORD./TRANS	
	ATTRIB. EFFECT	COEFF EFFECT	ATTRIB. EFFECT	COEFF EFFECT	ATTRIB. EFFECT	COEFF EFFECT	ATTRIB. EFFECT	COEFF EFFECT
KITCHEN MODERN.	0963	0470	0624	.0853	.0798	- 0410	.0806	.0743
AGE OF HOME	-.0592	.2724	-.0289	.2127	-.0928	.1673	-.0548	1713
AGE OF HOME (SQ.)	.0197	-.0857	.0044	-.0551	.0388	-.0620	.0111	-.0685
LOT SIZE	0093	-.2333	.0080	-.2840	.0103	-.1791	.0077	-.1661
LOT SIZE (SQ.)	-.0032	.2362	-.0032	.1115	-.0034	.0482	-.0028	.0860
NUMBER OF ROOMS	.0088	-.0185	.0067	-.5541	.0061	.1054	.0090	-.1761
NUMBER OF BATHS	.0582	.1441	.0415	-.0473	.0516	.2255	.0584	.0435
SQ. FT. LIVING AREA	.1821	-.1739	.1515	.3389	1.33	-.0494	.1905	0100
CONDITION	.023	.0623	.0295	.0403	.0121	-.0709	.0212	.0557
CENTRAL AIR	.0572	-.0166	.0274	.0148	.0533	-.0073	0530	.0182
FIREPLACE	.0621	.0098	.0547	- 0181	.0409	-.0173	.0771	.0003
GARAGE X #CARS	0569	0089	0251	-.0196	.0293	.0631	.0462	0274
	.5112	.1427	.3791	-.6190	.3590	.1825	4972	.0778
CONSTANT DIFFERENCE		0461		3178		1181		0190
PRICE DIFFERENCE		.1888		1488		0644		0968
TOTAL DIFFERENCE		.7000		.5279		4234		5940

TABLE VI[b]

HOUSTON RESULTS

PRICE DIFFERENTIALS DUE TO NEIGHBORHOOD FACTORS

	NBHD COEFFICIENTS FROM MARKET EQUATION	WHITE		BLACK		INTEGRATED		BORDER/NT		BORDER/T	
	β_i	$\bar{X}_i$	$\bar{X}_i\beta_i$	$\bar{X}_i$	$\bar{X}_i\beta_i$	$\bar{X}_i$	$\bar{X}_i\beta_i$	$\bar{X}_i$	$\bar{X}_i\beta_i$	$\bar{X}_i$	$\bar{X}_i\beta_i$
POLLUTION	-.0031	73.396	-.229	90.295	-.282	83.036	-.256	94.343	-.296	77.143	-.241
SCHOOL	.0072	56.635	.388	22.548	163	30.723	.222	37.860	.274	30.665	.222
DIST	-.0330	8.722	- 256	6.586	-.193	7.667	- 225	5 541	-.162	8.455	-.248
INCREMENT DUE TO NEIGHBORHOOD			-.097		-.312		-.258		-.185		-.267
DIFFERENCE COMPARED TO WHITE AREA			.000		-.215		-.162		-.088		-.170

TABLE VII[b]

HOUSTON RESULTS

PRICE DIFFERENCES BETWEEN NEIGHBORHOODS

AREA COMPARISON	ESTIMATED "PRICE DIFFERENCES"	EXPECTED PRICE DIFFERENCES DUE TO NEIGHBORHOOD CHARACTERISTICS
WHITE/BLACK	-20.78%	-23.97%
WHITE/INTEGRATED	-16.04%	-17.55%
WHITE/BORD.-NON TRANS.	-6.65%	-9.20%
WHITE/BORD.-TRANS.	-10.16%	-18.52%

TABLE VIII

ESTIMATED RATES OF HOUSING APPRECIATION BY NEIGHBORHOOD IN HOUSTON BETWEEN 1970-1976

Area	Rate of Appreciation
White Interior (all areas)	101.8%
White Interior (middle and upper middle class)	152.7%
Border/Non Transition	117.1%
Border/Transition	79.8%
Integrated	92.8%
Black	84.1%

IV. THE UNDERCONSUMPTION OF HOUSING BY BLACK HOUSEHOLDS

Past Studies

The existence of discrimination (both price discrimination and exclusion) leads to several hypotheses regarding differentials in housing consumption patterns between minority and non-minority groups. One such hypothesis is that, as a consequence of discrimination, Blacks are likely to consume less housing than Whites of the same socio-economic status. An examination of published data which is readily available seems to give credence to this hypothesis. This type of casual empiricism, however, usually fails to rigorously control for major differences in the socio-economic status that exist between Whites and Blacks.

While many studies have analyzed the existence and extent of differential housing prices faced by Blacks, less research has been focused upon differences between Black and White housing consumption patterns. To the extent that this empirical question has been investigated, most studies, found that Blacks tend to underconsume housing.

Rapkin (1966) was one of the early researchers that documented the low consumption of housing by Blacks. Using census data, he demonstrates that Blacks of similar socio-economic status live in areas with a greater amount of low quality housing and with greater percentages of substandard housing. In a more rigorous study, Straszheim (1974) shows that Blacks (ceteris paribus) expend about 10% less on housing and that low income Blacks spend about 15% less for housing than White counterparts. Straszheim's results also indicate that Black underconsumption of housing primarily

takes the form of abnormally low levels of quality, and that while housing quality differentials were large, house size differentials were rather small. Straszheim concludes that the primary cause for the differentials is the difference in prices paid by Blacks.

Others also document findings similar to Straszheim's. Quigley (1974) finds Blacks spend about 25% less on housing. Kain and Quigley (1975) disaggregate the overall underconsumption of housing into several categories of housing characteristics and find that Blacks consume 60% less quality, insignificantly less interior space, 17% less exterior space and 13% less neighborhoor quality. Using national data and two-stage least squares approach, Smith and Campbell (1976) estimate that on a national basis Blacks consume 9 to 12% less. However, as much as two thirds of this underconsumption is found to be attributable to differentials in income. Smith and Campbell also find that the ratio of defacto (due to income) to dejure (presumably due to discrimination) underconsumption differs significantly between regions in the U. S.

Suggested Explanations of the Underconsumption Phenomenon

Several explanations exist with regards to the apparent underconsumption of housing by Black households. One explanation is that since most studies focus on housing expenditures rather than actual consumption and since housing prices may be lower for Blacks, then Black expenditures would be expected to be less (ceteris paribus) as long as the price elasticity of housing demand is less than 1.[1]

[1]Even this latter restriction is unnecessary if price differences are all embedded in the a price term as opposed to b, the marginal price of housing attributes.

While such a hypothesis has merit, the underconsumption of housing cannot be that easily dismissed. This is especially true, given Straszheim's and Kain and Quigley's findings with respect to the consumption patterns among Blacks and Whites of specific components of the housing bundle.

Another popular hypothesis is based upon the presumption that in a segregated world Blacks face a highly restricted supply of housing. Thus, it is suggested that Blacks substitute away from a market in which they are discriminated against to other markets for which they have better access. Consequently, Blacks are expected to consume less housing because discriminatory segregation keeps them in neighborhoods with inferior quality housing. This hypothesis is also too simplistic, in part because it fails to explain why adequate housing is not produced or maintained in all Black areas.

In many cases segregation may take place because of the existence of some type of self-segregation. Such a situation would be consistent with Muth/Bailey models of prejudice, where Blacks simply outbid Whites in selected areas. For example, consider the following scenario where Blacks begin to move into a previously all-White area. Some Whites with a high aversion to living near Blacks will quickly move out. Prices may become somewhat depressed, opening the door to more Black immigration. Ultimately, not only do prices change, but the entire housing "submarket" changes.

New potential buyers in this submarket, seeking low cost owner-occupied housing available with a minimum down payment of 5 to 10%, typically have less income and wealth. Before transition occurred, when the market was "stronger", a seller of a home could get top dollar and sell to a purchaser who intended to finance the home with a 20 to 30% down payment con-

ventional loan. Because of the preferability of conventional mortgages in the stronger market, households who sought 5 to 10% down loans through F.H.A. mortgages were preempted, even if they could "afford" the capital price of housing there.

With racial transition, the housing market is assumed to soften and sellers thus must sell to "FHA buyers." Slightly lower home prices and the competitive availability of low down payment FHA loans now make the area even more attractive to Blacks with lower levels of wealth. To the extent that Whites have an aversion to living with or near Blacks the situation will be unstable. Equilibrium occurs only when the neighborhood is all Black and FHA financing eventually becomes the only viable mortgage instrument in the area. As long as FHA mortgages continue to be available, this will speed the transition process.

For what type of neighborhood and housing could such a transition process occur? To a great extent this depends on the options available to the Black middle class, especially to those that participate in the transition process. If White neighborhoods with high quality housing are perceived by Whites to be secure from minority intrusion, then Muth/Bailey type premiums will be paid by Whites. These racial premiums will discourage Blacks (even if they could afford it) from locating in the area, since they will be unwilling to pay the higher prices stemming from White prejudice. On the other hand, White neighborhoods with lower quality housing that may be financed with low down payment FHA loans may be perceived to be less secure from minority intrusion and hence warrant no special

premium. Because perceptions of the "racial security" of an area alter the prices of housing between areas, Blacks will have a strong incentive to move into inferior areas where the price (price per unit of quality) is relatively lower. Consequently, Black movement headed by the Black middle class is often directed toward White areas where relative housing prices are low because of the lack of prejudice oriented premiums.

Typically the basic level of neighborhood and housing structure quality is relatively low in these areas for which Whites perceive as potential transition areas. The end result is that middle income Blacks sacrifice neighborhood quality and housing structural quality in the attempt to achieve some degree of upward mobility in the housing market and access to integrated areas. In the long run, however, they are frustrated in the attempt by the eventual complete racial transition of the area. The result is that Blacks will tend to appear to spend less on housing because of lower prices in Black areas. They will also be observed to underconsume housing and neighborhood quality because of the nature of the neighborhoods where the middle-income Black efforts to integrate are focused and because most Black consumption of housing is restricted (in this case by their own optimizing choice) to areas that have been previously penetrated by the Black community in the past. In essence, this particular alternative view suggest that the key to understanding Black consumption of housing at any point in time is a correct knowledge of the process of the neighborhood transition and of the expansion of Black neighborhoods.

The scenario described above is not necessarily meant to be a description of fact, but to be suggestive of one of many reasonable hypotheses.

More important, it demonstrates the complexity of what seems on the surface to be rather a simple phenomenon: the underconsumption of housing by Blacks. This underconsumption is clearly a function of a wide variety of factors that affect both housing and location decision which may stem from either explicit market barriers or implicit incentives generated from a White-dominated housing market, where relative prices reflecting White prejudice distort the decisions of Black households.

Empirical Issues

While the cause of the so-called underconsumption affect is not at all well understood, past documentation of the phenomenon itself is also questionable. Several aspects of past studies make uncertain the extent to which Blacks actually underconsume housing. First of all, most studies including Straszheim (1974) and Kain and Quigley (1975) are much too casual with regards to adequately controlling for the generally accepted appropriate budget constraint. The absence of any consideration of differences in the wealth of households in previous estimations of demand or expenditure functions makes the Black/White differentials found highly suspect.

Another problem with past studies is that they tend to use pooled data of housing purchased by conventional mortgages and housing purchased with FHA mortgages. More and more evidence, beginning with Smith and Campbell (1974), indicates that the two markets are considerably different and that failure to test the robustness of any results across each submarket is a serious mistake. Furthermore, many studies do not distinguish between households that have recently made a home purchase versus those that have lived in their cur-

current house for some time. Questions are raised as to whether all households are in equilibrium or whether market conditions have changed sufficiently over time to make pooling data for such different households inappropriate.

Finally, analyses of race and housing in the current literature typically fail to distinguish between Black households purchasing housing in dominantly Black areas and Blacks purchasing housing in virtually all White areas. Such a comparative analysis is requisite to any validation of most discrimination and segregation models. Furthermore, the empirical question of whether "segregated" and "integrated" Blacks differ in their consumption of housing will provide insights regarding the importance of integration as a solution to minority housing problems.

The Analytic Approach Used

Both housing expenditure (or value) functions and individual demand functions for several key components of the housing bundle were statistically estimated. The analysis of individual housing characteristics employed factor analysis, much along the same line of Kain and Quigley (1975). The stated house value as indicated in the survey data and the actual value of the house indicated from the SREA data were both used in estimating the expenditure function to test for comparability. In general, both values were reasonably similar. However, for the few observations in the overall sample where some time had passed between the survey and when they had purchased their home, there appears a greater discrepancy between the two values.

In the analysis of Black/White differentials in the consumption of housing, considerable attention was given to the sensitivity of the results

to alternative definitions of the income variable used in the regression equations and to differences the inclusion of the wealth variable made upon the estimates of all key parameters. Some attention was also given to questions of specification, especially regarding the inclusion of demographic variables. However, since these specification questions are extremely complex and since they were beyond the scope of this project, most were not fully addressed. On the other hand, differences between Blacks in Black areas versus Blacks in White areas, and differences between households financing through FHA as opposed to conventional mortgage sources were examined more thoroughly, even though these analyses were also beyond the initial scope of the study. In this case, it was felt that the preliminary findings which are presented below provided additional insight needed to help clarify aspects of the complex underconsumption phenomenon.

Empirical Findings

(a) Primary Results

Table IX presents alternative results that differ in their specifications of the budget constraint. The first equation reported in Table IX uses actual stated income along with net wealth as a measure of budget oriented shifters. The estimate of .479 obtained from this first specification is not usually low for an estimated income elasticity from microdata where no special attempt is made to guarantee that the variable is representative of the household's permanent income.

The second and third equations use a predicted income variable, $\hat{Y}$, obtained from estimating an incomes equation. $\hat{Y}$ was obtained by the application of OLS regression analyses to income as a function of several human

capital type variables for each worker in the family as provided by the survey. This form of estimated income satisfies the arguments of many proponents of permanent income as the correct measure of the budget constraint shifter, in that the transitory components of current income are purged through the regression error term. The estimated income elasticity of .761 (third column, Table IX) is quite similar to past microestimates where the concept of permanent income has been given much more attnetion. The inclusion of wealth in the estimating equation (Second column, Table IX) lowers the income elasticity to .626, a finding consistent with results presented in Smith and Campbell (1974) and Smith and Campbell (1978). However, the wealth elasticity is somewhat lower than that found in the limited number of studies that include this variable.

Notice that in all cases both Black and Mexican-Americans are shown to consume less housing. For the most part, the level of underconsumption is reasonable similar between the two groups. It is significant, however, that the magnitude of the coefficients on the Black and Mexican-American dummy variables drops sharply when estimated income is used, falling from -.21 and -.22 to -.09 and -.11, respectively. This phenomenon occurs consistently, regardless of the definition of estimated income. In addition, the inclusion of wealth in the estimating equation lowers the coefficients on the racial/ethnic dummies as well, though the change is perhaps not as large as might have been expected.

Table X provides a large number of estimated coefficients for slightly different specifications of the basic equations described in Table IX. The primary differences involve: (1) the inclusion of alternative income

variables ($\hat{Y}$, $\hat{Y}_2$, $\hat{Y}_3$, Y_N); (2) the inclusion or exclusion of the wealth variable and/or the age dummies; and (3) the use of two-stage least squares to control for possible endogeneity between house value and wealth. This later set of specifications is also used to simultaneously provide an additional "permanent income" variable in the form of an instrumental variable for income that is created when income is made endogeneous. Finally, the last set of coefficients displayed (columns (27) to (44)) were obtained from regressions where the data sample was limited to households with married couples only or was split between households that purchased homes with either conventional or FHA mortgages.

Table X indicates that the inclusion of age and/or wealth does change the other parameters somewhat. Most importantly, the inclusion of wealth almost always lowers the magnitude of the Black and Mexican-American coefficients. On the other hand, the inclusion of the age dummies makes much less difference on the coefficients of these racial variables. In fact, it usually raises their magnitude somewhat. Most startling is the impact that alternative specifications of the income variable have on the Black and Mexican-American coefficients. With the exception of $\hat{Y}_2$, all "estimated" income variables significantly reduce the estimated minority underconsumption of housing.

(b) Alternative Specifications of Income and Wealth

The alternative income variables used represent various attempts to apply variables that might reasonable reflect a households permanent income position.

$\hat{Y}$ is estimated by OLS regression using a standard "incomes equation." This equation included such variables such as education, occupation, age, as well as Black/White and Mexican-American/White dummy variables. $\hat{Y}_2$ was estimated using the same specification but without the racial dummy variables. $\hat{Y}_3$ was created from two separate incomes equations, one for Whites and one for minorities.[1] In the two stage estimates, $\hat{Y}_x$ stands for the actual stated income variable (Y) taken to be exogeneous in the system of equations. $\hat{Y}_x$ is likewise $\hat{Y}$ taken to be exogeneous. Y_n is stated income but made endogeneous. Thus Y_n represents a form of an instrumental variable used as a proxy for permanent income. Also to be noted is that when W is accompanied by a subscript n, wealth was estimated as an endogeneous variable.

Of particular interest to this study is that the Black coefficients fall sharply when $\hat{Y}$, $\hat{Y}_3$ and Y_n are used, especially if wealth is also included in the equation. In fact, all estimates of the coefficient of the Black/White dummy variable are statistically insignificant when Y_n is used. Estimates of the income elasticity of demand are also sensitive to alternative specifications. The estimates most consistent with recent literature are obtained when either $\hat{Y}$ or $\hat{Y}_2$ are used. In terms of both the income and wealth elasticities the two stages least squares (2 SLS) specification with Y_n and W_n appears quite reasonable. In each of these cases, however, the underconsumption effect becomes quite small and in most cases disappears altogether. While not lending themselves to a precise conclusion, these results are, nonetheless, instructive. Taken together they suggest that the

[1]There was insufficient degrees of freedom to estimate a Mexican-American incomes equation alone.

so-called underconsumption affect could be an illusion, empirically created by improperly specifying the appropriate budget constraint(s).

(c) Subsample Results

Some alternative specifications created questions with respect to unusual differences found for households headed by a single adult. As a consequence separate regressions were estimated for only households with married adults. These results were not much different, however, from that obtained from the entire sample. Income elasticities were a bit higher and so were the Black and Mexican-American coefficients, though the use of $\hat{Y}$ still lowers their magnitude significantly.

The sample was also divided into households who financed their home purchase through federally insured mortgages (FHA and VA), referred to in the tables as FHA, and those financed privately as conventional mortgages, CONV. This dichotomy proved to be quite interesting. The FHA results are similar to the over all sample estimates except that estimates of the income elasticity are significantly lower. The coefficient of the Black/White dummy exceeds -.20 for this sample, though it does fall to less than -.10 when $\hat{Y}$ is used in the regression. On the other hand, for the conventional mortgage submarket the sign of the Black/White coefficient is positive regardless of the income variable used though the coefficient is never significant. Thus, Blacks who, for whatever reason, acquire owner-occupied housing through conventional mortgage markets show no sign of underconsumption, a phenomenon that is robust with respect to all specification variants attempted. As such, these tenative findings suggest that in future analyses of housing

consumption behavior between racial groups the role of home financing needs to be studied much more thoroughly.

(d) Blacks in Black Neighborhoods versus Blacks in White Neighborhoods

One important issue that is ignored in the literature is the extent that the consumption patterns of Black households which locate in predominantly White areas differs from Black households living in Black areas. To examine this issue, the sample of Black households were split into two groups: those living in Black, Integrated and Border areas and those living in White Interior areas.[1]

Table XI presents the results of the basic expenditure functions for four specifications where two alternative income variables are used and where the wealth variable is either included or excluded. While all other variables included in Table IX are used, only the elasticities with respect to income, wealth, and the demographic group dummy variables are reported.

As can be seen, the results obtained with respect to the income and wealth elasticities are quite similar to previous estimates. However, the racial or demographic elasticities differ significantly from past estimates. Black households living in Black neighborhoods appear to underconsume housing by nearly 40%. Even with the $\hat{Y}$ specification, Blacks in Black neighborhoods

[1]While Border areas are currently "White," it was felt that their proximity to Black areas and their potential disequilibrium nature would suggest that recent Black movers into these areas should not be classified among those Blacks that have definitely broken racial barriers and now reside in White interior locations. Unfortunately, the number of Black households in Border areas within the overall data sample was too small to distinguish them as a separate group in the empirical work. Also, the number of Mexican-American households that live in Hispanic ghettos was too small to distinguish as a unique group. (Mexican-Americans in Houston are relatively integrated throughout the metropolitan area, with two-thirds living outside areas with a Hispanic majority.

are estimated to spend between 18% to 26% less on housing, ceteris paribus. These figures are substantially higher than almost all previous estimates.

On the other hand, Blacks in White neighborhoods are found to consume approximately the same amount of housing as Whites. That is, the differential in the levels of expenditures on housing is not significantly different from zero between these Black households and the White control group. Such results appear to suggest that previous estimates of the Black/White differential are averages of the differentials that exist between the two sets of comparisons. Consequently, past estimates will have been affected by the nature of the sample used; in particular the percent of the Black population in the sample that lives outside the ghetto.

The results in Table XI suggest that further investigation into the differences between Blacks in Black areas versus those in White areas is clearly needed. Special attention should be given to individual cases of successful integration. In the sample used in this study those Blacks who lived in White areas had greater incomes and wealth than the average Black household in Houston. In fact, for the most part, Black incomes and wealth in White areas were not significantly different than their White neighbors. However, many Blacks with similar incomes as those who had moved to White areas still lived in the ghetto. Unfortunately, the number of Black households in White areas was quite small and they were located in a diversity of neighborhoods. Consequently a detailed analysis of this group was impossible. Hence, conclusions about the group are very tentative. If an generalization can be made at this point, it is that these households are virtually the only Blacks acquiring housing with conventional mortgages. This, of

course, is consistent with the results presented in Table X and provides further support to the suggestion that the role of financing home purchases warrants expanded analysis beyond such recent empirical studies on redlining as Schafer (1978) and Smith (1979).

(e) The Consumption of Housing Characteristics

Measures of underconsumption stemming from expenditure equations may be inappropriately identified if price differentials faced by Blacks and Whites do exist. Therefore, individual regressions of demand functions for four housing characteristics were estimated. These characteristics include lot size, home age, square feet of living area, and a weighted index of housing quality, where the implicit weights were obtained from previously estimated hedonic regressions. The four separate regression equations that were estimated not only ameloriate the problem of ambiguities in the interpretation of the underconsumption results that might be due to potential price differences, but they also provide better insights into just what it is that Black households are underconsuming.

Table XII provides the results of the regressions for each characteristic for two specifications, with Y and with $\hat{Y}$ used as the income variable. Again only the elasticities for income, wealth, and the racial variables are included in the table, though all other relevant variables were used as independent variables in the regression.

Several aspects of these results are worth noting. First, Blacks are shown to underconsume housing only in terms of age (older housing) and in terms of quality, a phenomenon which also holds for Mexican-American households. Given the other arguments (variables) that enter into the demand func-

tion, the levels of lot size and square feet of living area consumed seem to be no different among the demographic (racial) groups. Second, underconsumption of home quality (newness and the quality index) is not significantly affected by alternative income variables used, though alternative income variables do produce substantially different income elasticities.[1] These results provide the strongest evidence that, in fact, some degree of distortion exists in Black household housing consumption decisions. Neither difficulties in controlling for price differentials nor in measuring permanent income appear to influence the results. Black, ceteris paribus, are shown with little ambiguity to purchase older homes of inferior quality, findings that are reasonably consistent with those of Straszheim and of Kain and Quigley.

Summary

In summary, while a considerable portion of the results presented above provides a somewhat ambiguous answer to the empirical question of the existence of differentials between Blacks and Whites in the consumption of housing, the last set of results, where the demand for individual components of housing is estimated, makes any outright dismissal of the underconsumption thesis unwarranted. What can be said is that Blacks do appear to purchase older homes with inferior quality than White counterparts. Whether Blacks spend less on housing, on the other hand, seems unclear. The results obtained from alternative specifications of income cloud this issue, which was already complicated by the confusion that exists regarding the role prices play.

[1] Elasticities estimated with $\hat{Y}$ are typically larger, as would be expected, and for the most part they are more consistent with a priori expectations.

If Blacks do not spend less on housing, (as much of the results above indicate) then one may infer that, given their acquisition of inferior dwelling units coupled by their location in inferior neighborhoods (as shown in Section III), Blacks must, therefore, be paying more for the quality of housing and the quality of neighborhoods they are getting. In contrast, if Blacks do spend less on housing, then one must assume that there exists either explicit market barriers or implicit market forces that are distorting Black household decisions. In either case, whether it is due directly to exclusion or to the indirect effects of White prejudice, Blacks appear to be facing different housing market conditions. Thus, the concept of the existence of a Black housing "submarket" appears to have substantive merit.

TABLE IX

ESTIMATED CONSUMPTION FUNCTIONS:
ALTERNATIVE OLS SPECIFICATIONS
(DEPENDENT VARIABLE. HOUSE VALUE)

	with Actual Income (Y)	with Estimated Income (Ŷ)	with Estimated Income (wealth excluded)
LOG Y	.479 (10.)	.626 (7 8)	.761 (9 4)
LOG W	.073 (3.9)	.131 (7.6)	- -
BLACK	-.209 (2.5)	- 087 (1.6)	- 120 (2 2)
MEX. AMER.	- 217 (2.6)	- 105 (1.2)	- 148 (1.6)
FAMILY DEC.	009 (.14)	.041 (6.6)	098 (1 3)
FAMILY INC	033 (.85)	.036 (0.9)	057 (1 3)
2ND WORKER	- 074 (2.1)	-.117 (3.1)	-.160 (4.1)
PAST RENTER	-.133 (3 5)	- 164 (4.2)	-.234 (5 9)
OUT TOWN	.056 (0 9)	042 (0 7)	.022 (0 4)
OUT STATE	.050 (1.8)	.002 (0 0)	-.005 (0.1)
M STATUS	- 073 (1.3)	-.195 (3.1)	- 127 (1.9)
# CHILDREN	- 023 (1.4)	-.016 (0.9)	-.024 (1 3)
AGE 2	.085 (1.6)	.003 (.06)	.019 (0.3)
AGE 3	.083 (1.5)	-.031 (0 5)	- 018 (0.3)
AGE 4	.273 (4.5)	.134 (1.9)	134 (1.9)
AGE 5	.303 (4.6)	134 (1 7)	.165 (2 1)
AGE 6	.180 (2.4)	.022 (0 3)	.085 (1 0)
AGE 7	121 (0.7)	022 (0.1)	.085 (0 7)
QRT. SOLD	-.059 (2.0)	- 067 (2 8)	-.052 (3.4)
	R^2=.478	R^2=.447	R^2=.405

*t-statistics are given below each estimated coefficient

TABLE X

KEY COEFFICIENTS FOR ESTIMATED EXPENDITURE FUNCTIONS
WITH ALTERNATIVE SPECIFICATIONS
(Starred Coefficients are not Significant at 90% Level)

REGRESSION DESCRIPTION	(1) OLS Y	(2) OLS Y W	(3) OLS Y w/oAge	(4) OLS Y W w/oAge	(5) OLS $\hat{Y}$	(6) OLS $\hat{Y}$ W	(7) OLS $\hat{Y}$ w/oAge	(8) OLS $\hat{Y}$ W w/oAge	(9) OLS $\hat{Y}_2$	(10) OLS $\hat{Y}_2$ W	(11) OLS $\hat{Y}_2$ w/oAge
INCOME COEFFICIENTS	467	479	620	.534	.761	626	.856	707	1 01	842	.997
WEALTH COEFFICIENTS		.072		.077		.131		131		.128	
BLACK COEFFICIENTS	- 209	- 182	- 201	-.171	-.119	- 087	-.094	- 070	-.212	-.167	-.224
MEX AMER. COEFFICIENTS	-.217	-.212	- 264	- 234	-.148	- 105	-.137	-.100	- 209	- 156	-.218

TABLE X (CONT'D)

KEY COEFFICIENTS FOR ESTIMATED EXPENDITURE FUNCTIONS
WITH ALTERNATIVE SPECIFICATIONS
(Starred Coefficients are not Significant at 90% Level)

REGRESSION DESCRIPTION	(12) OLS	(13) OLS	(14) OLS	(15) OLS	(16) OLS	(17) 2SLS	(18) 2SLS	(19) 2SLS	(20) 2SLS	(21) 2SLS	(22) 2SLS
	$\hat{Y}_2$	$\hat{Y}_3$	$\hat{Y}_3$	$\hat{Y}_3$	Y_3	Y_x	Y_x	Y_x	Y_x	Y_N	Y_N
	W		W	w/oAge	W		W_N	w/oAge	W_N		W_N
	w/oAge				w/oAge				w/oAge		
INCOME COEFFICIENTS	.833	.830	.659	.943	.765	.541	.130*	.625	.107*	1 11	.826
WEALTH COEFFICIENTS	.125		.133		.131		.339		.439		.195
BLACK COEFFICIENTS	- 181	-.092	- 074	- 062	-.050	- 197	-.133	- 251	-.188	- 037*	- 014*
MEX. AMER. COEFFICIENTS	-.169	- 156	- 118	- 148	- 113	- 245	-.127	- 272	-.111	-.124	-.067*

TABLE X (CONT'D)

KEY COEFFICIENTS FOR ESTIMATED EXPENDITURE FUNCTIONS
WITH ALTERNATIVE SPECIFICATIONS
(Starred Coefficients are not Significant at 90% Level)

					Households With Married Adults Only						
REGRESSION DESCRIPTION	(23) 2SLS	(24) 2SLS	(25) 2SLS	(26) 2SLS	(27) OLS	(28) OLS	(29) OLS	(30) OLS	(31) OLS	(32) OLS	(33) OLS
	Y	Y	$\hat{Y}$	Y_N	Y	Y	Y	Y	$\hat{Y}$	$\hat{Y}$	$\hat{Y}$
	w/oAge	W_N	W_N	W_N		W	w/oAge	W		W	w/oAge
		w/oAge						w/oAge			
INCOME COEFFICIENTS	1.18	.957	.474	.620	.565	472	.625	.521	.850	.719	.912
WEALTH COEFFICIENTS		.145	.284	.207		.082		.086		.143	
BLACK COEFFICIENTS	- 045*	- 007*	-.056*	- 064*	-.269	-.256	- 251	- 238	- 150	- 126	-.133
HEX AMER COEFFICIENTS	-.108*	- 067*	-.056*	- 677*	-.258	- 226	-.272	- 240	-.127	-.079	-.116

TABLE X (CONT'D)

KEY COEFFICIENTS FOR ESTIMATED EXPENDITURE FUNCTIONS
WITH ALTERNATIVE SPECIFICATIONS
(Starred Coefficients are not Significant at 90% Level)

	Married Adults			Conventional Mortgage				FHA Mortgage			
REGRESSION DESCRIPTION	(34) OLS	(35) OLS	(36) OLS	(37) OLS	(38) OLS	(39) OLS	(40) OLS	(41) OLS	(42) OLS	(43) OLS	(44) OLS
		CONV.	FHA	CONV.	CONV.	CONV.	CONV	FHA	FHA	FHA	FHA
	$\hat{Y}$	$\hat{Y}$	$\hat{Y}$	Y	Y	$\hat{Y}$	$\hat{Y}$	Y	Y	$\hat{Y}$	$\hat{Y}$
	W w/oAge	W	W	w/oAge	W w/oAge		W	w/oAge	W w/oAge	W	W
INCOME COEFFICIENTS	.756	.466	669	.407	.342	535	461	280	.222	.662	.552
WEALTH	.141	135	091		099		.136			077	.088
BLACK COEFFICIENTS	-.119	153*	- 086	-.125*	- 041*	288*	145*	222	-.223	- 066	-.088
MEX AMER. COEFFICIENTS	- 076*	303	- 022	212	168	382	.307	- 228	-.178	- 086	-.045

TABLE XI

ESTIMATES OF KEY REGRESSION
COEFFICIENTS WITH SPECIAL SAMPLE
INCLUDING BLACKS IN WHITE NEIGHBORHOODS*

REGRESSION DESCRIPTION	OLS Y W	OLS Y w/o W	OLS $\tilde{Y}$ W	OLS $\hat{Y}$ w/o W
INCOME ELASTICITY	.436 (14.)	.571 (17.)	.649 (16.)	.826 (13.)
WEALTH ELASTICITY	.102 (7.6)	--- ---	.139 (6.3)	--- ---
BLACKS IN BLACK NEIGHBORHOODS	-.303 (7.8)	-.376 (7.4)	-.182 (5.5)	-.255 (4.5)
BLACKS IN WHITE NEIGHBORHOODS	-.052 (.71)	.009 (.37)	.010 (.98)	.011 (.87)
MEXICAN AMERICANS	-.189 (2.9)	-.207 (2 4)	-.078 (2.5)	-.096 (2 1)

*t-statistics are given below each estimated coefficient.

TABLE XII

KEY COEFFICIENTS OF DEMAND FUNCTION
ESTIMATES FOR SELECTED HOUSING ATTRIBUTES

DEPENDENT VARIABLE	Log (Lot Size)		Log (Age)		Log (Living Area)		Log (Quality)	
REGRESSION DESCRIPTION	OLS $\frac{Y}{W}$	OLS $\frac{\hat{Y}}{W}$	OLS $\frac{Y}{W}$	OLS $\frac{\hat{Y}}{W}$	OLS $\frac{Y}{W}$	OLS $\frac{\hat{Y}}{W}$	OLS $\frac{Y}{W}$	OL $\frac{\hat{Y}}{W}$
INCOME ELASTICITY	.225 (13)	.101 (1.4)	-.176 (2.7)	-.268 (1.0)	.168 (62.)	.489 (68.)	.172 (12.)	.73 (34.
WEALTH ELASTICITY	.020 (14)	.010 (54)	-.106 (5.6)	-.199 (21)	.056 (34.)	.072 (58.)	.100 (21.)	.12 (4
BLACK ELASTICITY	-.042 (.02)	.009 (03)	294 (6.7)	.411 (9.8)	.007 (.05)	.000 (.00)	-.224 (12.)	-.21 (7.4
MEXICAN/AMERICAN ELASTICITY	.279 (4 1)	.050 (40)	.428 (4.8)	.446 (2 9)	.013 (08)	.032 (.33)	-.209 (3.7)	-.18 (2.3

V. OWNER/RENTER TENURE DISTORTION

Past Studies

The literature which focuses primarily on owner/renter decisions in the housing market is relatively sparse. Most observers find that Blacks of equal economic credentials have a higher probability of being renters. However some authors provide persuasive evidence that Blacks may actually have a slightly higher propensity to own.

Kain and Quigley (1975) are among the first to rigorously document what most already knew or thought they knew: that Blacks had a greater tendency to rent than Whites of identical economic status. Kain and Quigley find that, in general, Blacks have a 9% higher probability of renting, ceteris paribus. In earlier work, Kain and Quigley (1972) document that this observed higher probability of renting varies between cities and depends upon such factors as the percent of single-family dwellings in the central city and degree of centralization of Black households.

Others, including Straszheim (1974), also find that Blacks have a higher probability of renting. After controlling for socio-economic factors, Straszheim reports that Blacks in general have a 10% higher probability of renting. Struyk (1975), who takes a somewhat different empirical approach, also finds a significant difference in Black/White propensities to rent. But of greater interest is Struyk's finding that improvements in Black incomes affect the probability of ownership for Blacks much more than alteration in price levels (presumably lowered by the elimination of price discrimination or through housing subsidization).

Two studies consider the impact of wealth on the tenure decision. Birnbaum and Weston (1974) indicate that when differences in wealth are considered that Blacks actually may have a smaller propensity to rent than Whites. In particular, they find that, nationally, Blacks have a 14% higher probability of renting if wealth is not considered, but have an 8% lower probability of renting when wealth differences are accounted for. For St. Louis, the city which is the focus for the Kain and Quigley research, the Birnbaum and Weston results were similar: a 5% higher probability of renting without accounting for wealth and a 9% lower probability when it is accounted for.

In contrast, Roistacher and Goodman (1976), who also attempt to control for wealth differences, find Blacks have a 26% higher probability of renting, though they present evidence that Black/White differential is decreasing. These results are obtained even when they include total savings as an explanatory variable, a variable that is admitted to be less than satisfactory as means to control for wealth differences. Roistacher and Goodman also find that for recent movers, the difference between Blacks and Whites is much less pronounced, a finding that reinforces concerns that the assumption of equilibrium consumption levels for all households may not hold.

Alternative Explanations of the Tenure Distortion Phenomenon

Not only is the literature inconsistent in demonstrating the empirical phenomenon of higher propensities of renting by Black households, explanations of the purported phenomenon are simplistic and inadequate. Furthermore, while Birnbaum and Weston make an important contribution in considering

wealth, much more investigation into the wealth accumulation process and its impact on housing decisions is called for. If wealth is a major factor, it may well be that past discrimination, which in earlier periods resulted in Blacks being excluded from owner-occupied markets, has prevented them from acquiring wealth through equity accumulation. Such an occurrence could reinforce any current limitations upon opportunities for ownership even though explicit barriers may be beginning to be dismantled.

While very little evidence has been provided to document or explain tenure distortion among Blacks, several hypotheses are suggested in the literature. One explanation is that Blacks, because of discrimination and exclusion, are presented a limited choice, especially in ghetto areas dominanted by rental properties. Another explanation exphasizes the constraint created by higher owner-occupied home prices faced by Blacks, a phenomenon which is shown in Section III to be questionable.

An alternative explanation related to the first two hypotheses is the suggestion that through exclusionary segregation, Blacks face such a restricted supply of housing that they turn to other areas of consumption where access is more open. Home ownership is simply a part of that sacrificial choice as Blacks turn away from housing in general.

Perhaps the most popular current hypothesis is related to purported discrimination in mortgage lending practices, in particular redlining. While this hypothesis has definite merit, there does not exist any strong empirical evidence documenting its existence, nature, extent, or impact. Questions of financing also pertain to issues involving the role of wealth. If Blacks do, in fact, tend to have a higher propensity to rent, consider-

able research will need to be conducted to sort out what is likely a very complex phenomenon.

While this research does not attempt to provide a comprehensive description of the tenure distortion problem, as with previous empirical issues discussed in Sections III and IV, it is felt that the refinements made in measuring the phenomenon in this study will lead and give focus to further research efforts to resolve many of the unanswered questions.

Key Empirical Issues

The primary empirical question focused upon in this study is the impact of including wealth as an independent variable in the estimating equations. It was anticipated that at least some of the apparent tenure distortion could be explained by past failures to account for a household's wealth position. In addition, because of the findings in Section IV, alternative specifications of the income variable were also considered important. In contrast to past estimates of consumption or demand functions, even less attention has been given in the literature to the sensitivity of tenure decision parameters to different income variables used in the analysis.

Few studies also use the appropriate statistical analysis. However, the development of improved statistical approaches to the analysis of the dichotomous outcomes is rather new. In general, the past literature reflects a level of analysis that is reasonably consistent with the state of the art. Kain and Quigley (1975) used GLS regression analysis and more recently Li (1977) used logit analysis in examining the tenure choice question.

Perhaps the most startling aspect of past analyses is that none of the previous studies question or discuss the representativeness of the sample used in the analysis. Using continuous variables, economists have for some time ignored the requirements of "representativeness" in the samples used for empirical studies. However, with logit or any other analysis of dichotomous choice, the representativeness of the sample is in itself information and the use of an unrepresentative sample can lead to enormous biases. Kain and Quigley"s results are one example of an owner/renter analysis that is highly suspect because of this problem. Though they do give some attention to the representativeness issue as applied to their hedonic estimations and to their expenditure functions, they ignore this issue entirely with regard to their owner/renter analysis where it is much more important.

The Approach Applied

The basic statistical tool used in this study is logit analysis, though OLS estimations are also provided. Only single equations were run at this time, because of data limitations. However, in general, separate Black and White owner/renter equations would be preferable. The basic tenure equation was estimated with and without wealth as an explanatory variable and considerable experimentation was conducted with alternative specifications. Again, special attention was given to the use of different income variables.

To overcome the problems of sample representativeness, a sample was created by a process of duplication of observations. The goal was to create

a sample that was representative of Harris County's (the Houston metropolitan area) population with respect to income, tenure and racial distributions. To illustrate the extent of the biases that can be introduced using an unrepresentative sample, results from samples of different distributions are presented in Table XV for comparison.

Empirical Results

Table XIII presents the estimation of the basic owner/renter equation using both OLS and logit regression analyses. The OLS results provide elasticities directly. The logit elasticities provided in Table XIII were calculated from the logit coefficients using the appropriate probability transformation at the mean of the X_i. All elasticities have signs that were expected. While logit analysis should not alter the sign of coefficients, the magnitude of the estimated elasticities and the significance levels of each were anticipated to differ.

It must be remembered, however, that OLS and logit elasticities are not directly comparable. Logit analysis explicitly assumes non-linearity. Hence elasticities change along the probability function. Furthermore, while it seems reasonable to calculate the logit elasticities at the mean probability of the estimating sample, there does exist some arbitrariness in that choice.

In both equations wealth appears to be the "strongest" explanatory variable. In the OLS equation this is borne out by the Beta statistics and the incremental R^2's which show that wealth almost totally dominates the estimating equation. In the logit it can be seen by an examination of the

realtively high t-statistic for the wealth variable.

The logit results indicate that a 100% increase in income and wealth will result in an 18% and 16 % increase in the probability of ownership, respectively. Households with married couples have a 31% higher probability of owning than do households with one single adult. Households recently moving from out of town have a high probability of renting and households that previously rented have a 6% higher probability of renting, even when accounting for differences in household wealth. The age dummies reveal to some extent life cycle patterns, though it is not clear why the 25-30 age groups (Age 2) should have a lower probability of owning than the youngest group. Interestingly, the second worker discount, evident in the consumption/expenditure functions, does not appear in the tenure choice estimations.

Both OLS and logit estimations indicate that Blacks and Mexican-Americans have a lower probability of owning, ceteris paribus. Blacks appear to have a 20% lower probability of owning, though in this case the difference between the logit and OLS estimates is quite evident. On the other hand, Mexican-Americans appear to have a 10% lower probability of owning regardless of which statistical technique is used.

Similar to the estimations of the consumption functions in Section IV, the estimated differentials in Black/White ownership probabilities are sensitive to alternative specifications. As before, the use of an estimated income variable ($\hat{Y}$ or $\hat{Y}_3$) significantly lowers the Black/White differential.[1]

[1] $\hat{Y}_2$ was not used in the logit estimations because of the complications of creating this variable within the logit software package.

Nonetheless, no specification reversed the conclusion that Blacks, ceteris paribus, tend to have a significantly lower probability of owning. The lowest estimate is -7%.

The exclusion of wealth raises the estimated differential somewhat, but clearly the results shown in Table XIV indicate that the absence of wealth in past studies cannot explain away the tenure distortion phenomenon. The exclusion of the age dummy variables produces ambiguous results, raising the probability differential when OLS is used and lowering it when logit analysis is used.

Particularly interesting are the results presented in Table XV, where the owner/renter equation was estimated using different samples of various distributions with respect to: (1) the number of Blacks and Mexican-Americans in the sample; (2) the number of homeowners; and (3) average level of household income. Except for Sample 5, where mean wealth is particularly low, the wealth elasticity is reasonably robust. On the other hand, the estimated income elasticities change significantly, with a range of .06 to .24.

In general, higher elasticities are associated with samples where mean income or wealth are below the Harris County average or where either Blacks or Mexican-Americans are under-represented in the sample. The results shown in Table XIV are considered most accurate, given that the sample used (referred to in the table as REP) is basically representative of the Houston Metropolitan Area. Table XV is provided here simply to indicate the severity of the representativeness problem as suggested earlier. These results show that Blacks and Mexican-Americans can be "demonstrated" to have

either higher or lower probabilities of homewonership, depending upon the sample used.

The representative sample was created from the initial data set by duplicating observations such that the new set of observations was reasonably representative of Harris County's population with respect to race, income and ownership. This, of course, does not guarantee that the sample is completely representative, especially with respect to other key independent variables. Nonetheless, the robustness of many variables such as wealth, gives some indication that the elasticities of other variables not adjusted for representativeness are probably not terribly biased.

Summary

Though the results above seem somewhat sensitive to alternative specifications and samples, these results are actually more robust than those found in Section IV. For the sample that is reasonably representative of Harris County population characteristics and for all alternative specifications, Blacks and Mexican-Americans are found to have unambiguously lower probabilities of owning. While the inclusion of wealth lowers the magnitude of estimated tenure distortions, it clearly does not eliminate it. The same is true when estimated income is used in the regression equations. Thus, while the literature may be flawed somewhat for ignoring the issues of appropriate measures of permanent income, the inclusion of wealth, and the sample representativeness, it appears that the basic conclusions of past studies hold up rather well. In Houston, Blacks and Mexican-Americans are found to have 10 to 15% lower probabilities of owning their homes, a finding that is not much different from previous research for other areas.

TABLE XIII

OWNER/RENTAL ANALYSIS
ESTIMATED ELASTICITIES USING
HARRIS COUNTY REPRESENTATIVE SAMPLE*

INDEPENDENT VARIABLES	LOGIT	OLS
Log Income	.181 (2.5)	.308 (1.9)
Log Wealth	.162 (12.)	.126 (22)
Marital Status	.306 (6 8)	.267 (12.)
#Children	.014 (1.0)	.003 (.42)
Black	-.202 (4.3)	-.103 (7.7)
Mex. Amer.	-.094 (1.7)	-.101 (8.1)
Family Inc.	.229 (3.7)	.149 (8 7)
Family Dec.	- 287 ((6.8)	- 118 (4.2)
Past Tenure	-.060 (1 9)	- 022 (1.4)
Out of Town	- 476 (9 6)	-.198 (9.9)
Out of State	-.185 (4 3)	-.119 (6.4)
Age 2	- 103 (2 1)	- 003 (01)
Age 3	028 (.54)	.036 (1.6)
Age 4	.058 (.54)	104 (1.6)
Age 5	.269 (93)	162 (3.7)
Age 6	193 (3 8)	094 (5.4)
Age 7	203 (2 5)	.193 (5 1)
Second Worker	.017 (48)	002 (0 1)
	x^2=302	F=19 20

*Logit coefficients above are elasticities estimated at the means of the X_i.
The asymtotic t is given in parenthesis below each coefficient

TABLE XIV

OWNER/RENTER ANALYSIS KEY ELASTICITIES
FOR SELECTED ALTERNATIVE SPECIFICATIONS

ANALYSIS DESCRIPTION	(1) REP OLS Y	(2) REP OLS Y w/oAge	(3) REP OLS Y w/oW	(4) REP OLS $\hat{Y}_3$	(5) REP OLS $\hat{Y}_3$ w/oAge	(6) REP OLS $\hat{Y}_3$ w/oW	(7) REP OLS $\hat{Y}$	(8) REP OLS $\hat{Y}$ w/oAge	(9) REP OLS $\hat{Y}$ w/oW	(10) REP LOGIT Y	(11) REP LOGIT Y w/oAge	(12) REP LOGIT Y w/oW	(13) REP LOGIT $\hat{Y}$	(14) REP LOGIT $\hat{Y}$ w/oAge	(15) REP LOGIT $\hat{Y}$ w/oW
INCOME ELASTICITY	.089	072	.319	.308	.257	535	.330	.283	.613	.132	.110	.363	.181	.187	.409
WEALTH ELASTICITY	.130	147		126	.138		.133	.141		.141	.154	.363	.162	.167	
BLACK ELASTICITY	-.168	-.176	- 220	-.103	-.126	- 159	- 072	- 103	- 124	-.244	-.179	- 280	- 202	-.147	- 237
MEX AMER ELASTICITY	-.134	-.157	-.156	- 101	-.116	- 094	- 105	-.123	-.107	-.126	-.175	-.145	- 094	-.144	-.100

TABLE XV

OWNER/RENTER ANALYSIS: KEY ELASTICITIES
ALTERNATIVE SAMPLE DISTRIBUTIONS

ANALYSIS DESCRIPTION	(1) SAMPLE 1	(2) SAMPLE 2	(3) SAMPLE 3	(4) SAMPLE 4	(5) SAMPLE 5	(6) SAMPLE 6	(7) SAMPLE 7	(8) SAMPLE 8	(9) SAMPLE 9	(10) SAMPLE 10	(11) SAMPLE 11
INCOME ELASTICITY	.060	.065	.093	.066	.244	112	.122	.072	118	.141	.204
WEALTH ELASTICITY	.174	.196	.106	.176	.077	.113	117	.113	124	.116	.148
BLACK ELASTICITY	.038*	-.012*	.063	.054	039	-.190	- 150	-.146	-.042	-.137	-.224
MEX. AMER. ELASTICITY	.058	.065	106	.049	.040	-.148	-.009	.114	.053	-.179	.174

VI. SUMMARY OF EMPIRICAL RESULTS AND THEIR IMPLICATIONS

Contributions to the Race and Housing Literature

To some extent this research was purposefully biased against the proposition that the experience of Blacks in the housing market is different than that of Whites. That is, issues are raised which question whether previous studies fully accounted for all factors other than race that might account for observed differences between Black and White housing consumption patterns. Many questions and inconsistencies in the race and housing literature are still left unresolved. However, virtually all of the empirical results presented in this study, including the fact that there exists significant differences in the housing price structures of Black and White submarkets, suggests that markets are segmented by race. Furthermore, although less conclusive, it also appears that Blacks consume less housing and have lower probabilities of home ownership, ceteris paribus.

These findings are consistent with hypotheses that suggest that Black alternatives in the housing market are restricted and that Black access to the owner occupied housing market is limited. However, they are also consistent with expected outcomes stemming from Muth/Bailey type prejudice models.

Thus, while this study tends to verify the general proposition that Black households face significantly differently market conditions in the acquisition of housing, important questions regarding the source of these differences is left incompletely answered. That is, it is still not clear to what extent these differences are due to explicit discrimination in the housing market as opposed to other more subtle and less direct phenomena involv-

ing the mechanisms of race sensitive urban housing markets which can generate these same observed outcomes. The latter might include the existence of strong housing market incentives which would lead Blacks to choose to acquire less housing and neighborhoods and to choose to remain segregated. Clearly, further research is still required in order to resolve this question and, in particular, to test the validity of the two major alternative models: the Muth/Bailey models of prejudice and the Cournant/Yinger models of exclusion and discrimination.

Even though this study was unable to document the extent of explicit discrimination and exclusion against Black households, the research reported above makes several contributions. First, it provides a more rigorous and accurate estimate of the actual extent of differential market conditions and outcomes for Blacks. Second, in carefully developing methodologies that avoid many of the errors of previous studies, this research generates a new impetus toward the reconciliation of a very confused literature on race and housing. To the extent that monitoring the progress of activities which attempt to promote equal access to housing for all races is considered important, then appropriate methodologies must be agreed upon and a concensus must be reached regarding the relationship between observed phenomena and discriminatory housing practices. For this reason equal attention was given in this study to resolving issues of methodology as was given to obtaining definitive estimates of Black/White differentials.

In all likelihood, a wide variety of factors, including discrimination, interact together in a rather complex manner. Consequently, analyses that focus on any one race and housing issue alone are apt to reveal very little

about the causes of the phenomena they document, and may actually lead to misinformation. Therefore, the approach taken in this study was to analyze together all of the major phenomena purported to be consistent with discrimination using the same data base, and then, to the extent possible, integrate the findings. Because of this rather ambitious approach to the analysis of issues involving race and housing, it was recognized from the onset that the work involved would exceed the time and resource constraints of this particular grant. As a consequence, many conclusions must at this point in time be considered preliminary. The tentativeness of the conclusions stem in part from the continued existence of missing pieces to the empirical puzzle that preclude complete, comprehensive answers. In fact, until further analyses are pursued which can resolve these remaining issues, rushed attempts to develop broad generalizations from the findings presented here could actually be counterproductive. In some ways, therefore, this study appears to generate more questions than answers. However, such a possibility was fully anticipated. From the beginning it has been assumed that the fact that all issues involving the race and housing literature were not to be resolved would not in any way diminish the value of the new insights generated from this research.

Blacks and the Price of Housing

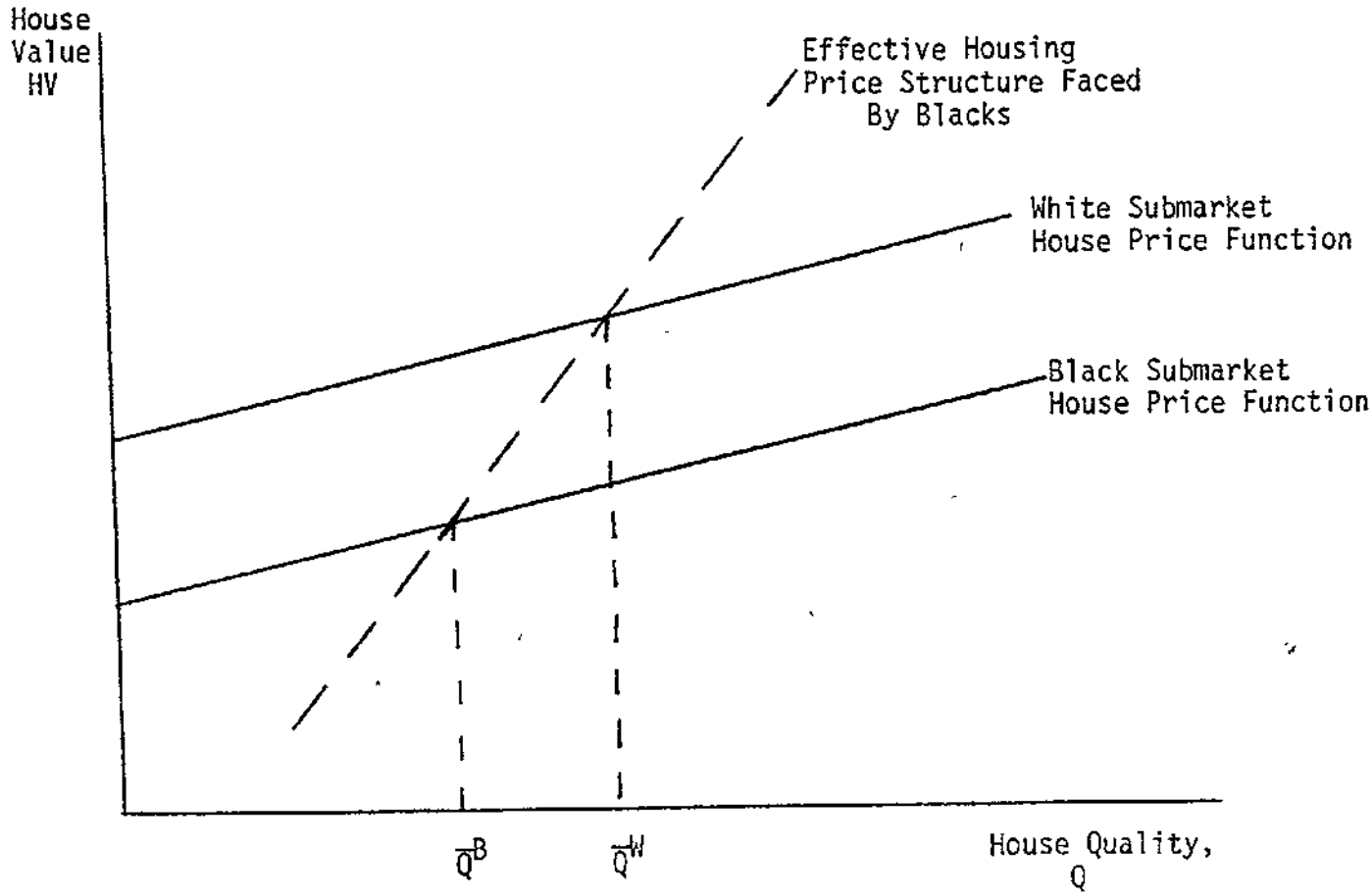
The results presented above indicate that Blacks pay about 20% less for housing, defined to include structure and land but not the neighborhood environment. However, once key neighborhood amenities are controlled for, the "price" differential seems to disappear. In general, the price function

across housing characteristics is shown to differ significantly between submarkets. In addition, within submarkets, Blacks are shown to have faced lower marginal implicit prices for most housing characteristics. This phenomena must be considered in light of the highly segregated nature of their different submarkets and of the differentials that exist in the quality levels of the stock of housing in each area. From this perspective, Blacks actually appear to face higher prices for increased housing. That is, for a middle income Black households to significantly increase both housing and neighborhood quality it would have to move to a White neighborhood, but in doing so it has to pay the price of increased housing quality in addition to the White area premiums as shown in Figure 7 below. Blacks faced with this high marginal price of acquiring greater levels of home quality may choose instead to restrict their consumption of housing to amounts consistent with quality levels available in the lower cost Black neighborhoods. As a consequence, higher income Blacks will be observed to increase their consumption of only those housing attributes which are readily available in the ghetto.

Given the structure of housing prices in Black and White Submarkets found in Section III, it is reasonable to expect that Blacks would tend to "adequately" consume interior and exterior space which are available and "cheap" in Black areas and to underconsume house quality that is limited and relatively more expensive in those areas. Furthermore, Blacks would be expected to underconsume neighborhood quality, if for no other reason than the fact that market realities provide them with strong incentives to remain in the ghetto where neighborhood quality is lower. On the other hand, those Blacks that do move to White areas and that, in essence, have paid the lump

FIGURE 7

Housing Price Structure Faced by Blacks
Considering a move from the Ghetto to
Better Quality Housing in a White Neighborhood



premium to live in a White neighborhood, face the same implicit marginal prices as do their White neighbors. Thus, they would be expected to consume similar levels of housing as their White counterparts (ceteris paribus). These Blacks, however, must have rather strong preferences for neighborhood amenities or perhaps for living in White areas.

Such expectations, as described above, are confirmed by the findings of Section IV. Of particular interest is that Blacks in White areas do not underconsume housing. Because this latter result is consistent with expectations and because such a phenomenon provides greater insights into the causes of segregation and underconsumption, it seems clear that valuable information could be obtained from further analyses of Black households residing in predominately all White areas. In particular, it would be useful to identify those distinguishing characteristics of Black households who choose to live in White areas.

Differential prices paid by Blacks can affect their housing consumptions in several other ways. First, because of lower prices, Blacks can buy comparable housing at a lower level of expenditure. To some extent this could explain the phenomenon that Blacks spend less on housing. In addition, since Blacks face different implicit marginal prices for various components of housing bundle, the consumption mix of housing attributes that Blacks consume is likely to be altered. However, while relative prices between various components of the housing bundle differ between White and Black areas, in many cases these differences seem to only slightly affect the housing consumption patterns of Blacks. For example, while the marginal price of purchasing somewhat younger housing is lower for Blacks in Black

areas, they, nonetheless, consume older housing. Consequently, it appears more likely that to the extent that price differentials are responsible for the underconsumption affect, it is differentials in implicit prices across the segmented markets, not within them, that is most important.[1]

Finally, as previously alluded to, price differentials that distort Black location decisions will indirectly alter consumption patterns. With Black neighborhood prices discounted, Black households will have incentives to remain in the ghetto. But if the supply of housing in the ghetto provides limited options with respect to housing quality levels, then the price incentive to remain in the ghetto will result in an implicit incentive to consume lower quality housing.

While differentials in home prices in Black and White areas may be explained by either discrimination or prejudice, another explanation of the price differentials observed is that they are merely the by-product of utility maximizing behavior. Given relative preferences, Blacks simply choose to live in less desirable neighborhoods where "prices" are lower and housing is "affordable." Such a scenario is also consistent with the empirical findings on consumption patterns, which indicate that Blacks underconsume home quality and neighborhood quality, but not interior or exterior space. This suggest that, given income, wealth, and family size, Blacks may have a relatively higher demand for living space than for the luxury of structural and neighborhood quality. That is, Black preferences differ from Whites.

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[1]However, more research is required to completely understand this phenomenon, since the lower "price" of younger housing may reflect less demand for such housing in what appears to be a segmented housing market. Thus, the separate supply and demand effects are not properly identified.

If this hypothesis is correct, Black segregation could be self-imposed as they simply locate in areas where they out-bid Whites. If Whites have a higher relative demand for neighborhoods than do Blacks, then Blacks as the highest bidders, will locate in lower quality neighborhoods which have adequate housing in terms of exterior and interior space. While this hypothesis is likely incorrect, it further illustrates the fact that conclusions from analyses of price differentials should not be made without consideration given to observed differentials in consumption patterns and vice versa.

Likewise, this hypothesis illustrates that while the empirical findings in Section III supported by the results described in other sections are consistent with urban housing models of prejudice in the absence of explicit discrimination or exclusion (the Muth/Bailey Models), they are not in themselves sufficient evidence to substantiate such models.

In light of the possiblilties suggested above, further analyses of integrated neighborhoods and of the neighborhood transition process could obviously provide important insights. In particular, such analyses might help in determining the source of the price differentials that apparently affect the consumption of both housing and neighborhood by Black households. If it is White prejudices that generate these price differentials, then this prejudice behavior should be observable in areas of transition, or in other words, in marginal areas where White prejudice prices are insufficient to keep Blacks from moving in. If Whites in these areas are strongly adverse to living with or near Blacks, the subsequent White flight from those areas into which Blacks are beginning to move will lower prices even further. The eventual result will be total racial transition as the lower prices make the area more and

more attractive to Blacks. Thus, integration will be inherently unstable. Clearly price differentials not only play an important part in keeping Black and White markets segmented, but they also appear to play an important role in the transition process.

As a final word of caution, it should be noted that in drawing inferences about price differentials and their impact on Black households, one should avoid broad generalizations and loose comparisons from cross sectional analyses between cities. While the Houston and Chicago results were remarkably similar (much more than anticipated), differences did exist in the housing price structure between the two cities. This is indicative of the fact that each city has quite different housing markets, reflecting differences in the population distribution of various demographic groups and the distribution of the stock of various types of housing in each metropolitan area. Consequently, for each city the empirical results regarding price differentials could be open to different interpretations. As such, policies to promote integration and improve Black accessibility to housing in one city may not be applicable in the other.

The Underconsumption of Housing by Black Households

Section IV presents important findings regarding the apparent Black underconsumption of housing. While these vary considerably, it appears that Blacks of similar socioeconomic status as Whites spend about 10% less on housing. This could be due, at least in part, to the fact that, as in previous studies, it is housing expenditures which is being explained. Since Blacks pay lower prices, to some extent respect, low expenditures are to be

expected. That is, because of lower prices, Blacks can buy comparable housing at a lower level of expenditures, thus possibly explaining why Blacks spend less on housing. On the other hand, the evidence that Blacks actually underconsume key attributes of housing by as much as 15 to 20% suggests that lower prices cannot explain the entire underconsumption phenomen.

Section IV also provides evidence that Black incomes appear to be somewhat discounted in the housing market. This could be because Blacks may have a larger transitory component of income. Such a hypothesis is supported by the fact that almost all specifications which use some type of permanent income variable (instead of current income) obtain lower estimates of the percent level of underconsumption. Furthermore, while additional exploration is required, tentative evidence was also found to suggest that occupational class may also influence the amount of housing an individual can buy. Members of occupational groups that have high concentrations of minorities typically had the greatest difficulty in acquiring housing consistent with their earnings. Finally, the discount of Black incomes also may stem from prejudices formed from weak generalizations about income and Blacks as a group. Because Black incomes are significantly lower on average than Whites, the income of a Black that exceeds the White mean may be considered an aboration and only temporary.

Regardless of the exact reason, the empirical results from Section IV indicate that it is highly likely that past studies have not used a proper measure of permanent income in analyzing Black/White differences. Nonetheless, it also is likely that, even after properly controlling for differences in the "true" budget constraint, the economic position of Blacks is still discounted in the housing market.

Perhaps the strongest evidence that Blacks face severe limitations with respect to their access to housing for which they could afford is the fact that they unambiguously underconsume housing quality. If housing quality has embedded into it the premium prejudiced Whites are willing to pay for all-White areas, then the underconsumption of quality could occur in the absence of explicit discriminatory barriers or exclusion. In this case, to increase the level of structural and neighborhood quality, Blacks must not only pay the additional price of these attributes, but they must also pay the price of locating in predominately White areas. Therefore, Blacks who wish to acquire better quality homes in better quality neighborhoods must be willing to give up the discount on housing structure found in the Black ghetto. Blacks, who consequently must indirectly pay these higher prices for housing and neighborhood quality at the margin while simultaneously being forced to pay a locational premium to live in a White neighborhood, will have a strong incentive to consume less quality housing.

Because the underconsumption of housing quality is equally consistent with explicit discrimination and exclusion, further research is obviously needed to examine this issue in more detail. Particularly useful would be an expanded analysis of areas currently occupied by Whites where Blacks would be willing to and could afford to purchase housing. In addition, further refinement in estimates of relative demand for different housing characteristics is needed in order to address such important questions as whether the relative demand by Blacks for interior space is sufficiently high to explain why housing and neighborhood quality are apparently sacrificed for exterior and interior space.

Low Black Ownership Rates

Whereas some of the results reported in Section III and IV indicate that Black/White price and consumption differentials may not exist, the results presented in Section V unambiguously indicate that Blacks have lower ownership rates. In that section, Blacks are shown to have at least a 10% lower probability of owning a home, ceteris paribus. While it is demonstrated that past studies of Black ownership rates are likely biased by the use of unrepresentative data samples, it is now evident that this problem cannot completely explain the lower ownership rates found in earlier studies. Furthermore, though wealth and previous housing tenure are quite important in explaining ownership, their inclusion also does not eliminate the disparity that exists between Whites and Blacks.

The exact cause of the low ownership is not clear. In part it may be due to Black segregation in areas with a higher percentage of rental units. Were such the case, aggressive fair housing efforts to open up new owner-occupied areas to Black households would be required. Poor access to traditional mortgage money may also be a factor. Indeed several pieces of evidence suggest that more monitoring of mortgage lending patterns could be valuable.

The fact that the inclusion of wealth in all estimating equations lowers the Black/White differential suggests that lower levels of wealth does make it difficult for many Black households to acquire and/or maintain owner-occupied housing. However, again, this alone cannot explain the entire difference between Whites and Blacks. In addition, the empirical findings from Section V also indicate that Black incomes are discounted in the

process of acquiring owner-occupied housing (that is, as it affects their ability to buy instead of rent) as appeared to be the case with respect to housing expenditures. Together, the empirical findings involving wealth and income seem to suggest that subsidy programs may need to be redesigned. That is, effective subsidies are needed to overcome both income and wealth deficiencies in order for minorities and other lower income households to be able to acquire and continuously maintain owner-occupied housing.

The Importance of Wealth to Household Housing Consumption and Ownership Opportunities

The empirical verification of the importance of wealth as a separate and distinguishable part of a household's budget constraint in effecting the level of consumption of owner occupied housing is a major contribution of this research effort. Individuals having identical incomes may still have different levels of current wealth due, for example to past windfall gains (or losses) or unusual savings histories. It is shown in Sections IV and V that both tenure and expenditure choices are affected as much by wealth as by income. Indeed, entry into the owner occupied market is shown to be particularly dependent upon wealth accumulated by families through past savings decisions. While this has been implicitly recognized by housing analysts for some time, most forms of income used in past demand studies do not incorporate wealth as a part of the budget constraint.

Considerations of wealth could be incorporated into analyses of demand in several ways. One alternative approach to include wealth in demand analyses is to define a single budget constraint as the expected present

discounted value of explicit future income from all sources, including debt repayment obligations and implicit income flows from capital assets such as consumer durables. However, while this might fully account for all aspects of a comprehensive budget constraint, because of inefficiencies in capital markets in a world of risk and uncertainty, various components of this broader definition of income are not likely to be perfect subsitutes. As a consequence, they are apt to be weighed differently in the housing market. That is, an additional $10,000 in the present discounted value of a family's future income stream may not be "worth" as much in purchasing a house as an additional $10,000 in a savings account.

Traditionally,wealth is considered important in acquiring housing in order to meet downpayment and closing cost requirements. Few conventional mortgages can be consummated in today's housing market for less than $10,000. In most cases, such costs must be financed out of a household's wealth. Given that most middle income White areas require conventional financing and that Black households (ceteris paribus) have less wealth, it is easy to understand why few Blacks break the segregation barrier.

During the 1960s the barrier to home ownership created by high closing costs and downpayments was partly negated for low income families by the FHA-235 program. This program was considered at its inception a major step forward in ameliorating the problems faced by lower income families in acquiring owner occupied housing. However, the program was plagued by excessive abandoment rates of "235" housing, which were typically vacated in poor physical condition. Most of the problems were attributed to the poor quality of initial construction and HUD's failure to properly manage the

program. However, it is more likely that the problem stemmed from a failure to recognize and appreciate the importance of family wealth in maintaining home ownership.

As Kain and Quigley (1975), de Leeuw (1971) and Reid (1962) argue, a host of additional and often unexpected expenditures, including repairs, accompany home ownership. Such costs do not directly affect renters. For most home owners payments for home improvements and/or corrective maintenance are spent out of their wealth. When a household's net assets are insufficient to meet necessary expenditures for maintenance and unexpected repairs, the resultant neglect will result in the deterioration of the home regardless of the initial quality of construction. If a home's value minus transactions costs is less than the outstanding mortgage, the excessive burden of ownership expenses can make it more economical to abandon the house than to continue to absorb the costs. The probability of this occurring is especially high for families with negligible discretionary income to supplement and add to their wealth. Consequently, wealth is important with regard to a family's ability to both enter the owner occupied housing market and to assume the continuing financial burden of home ownership.

In this light, it becomes evident that a once and for all "wealth subsidy" through, for example, low downpayment requirements will have significantly different effects than an income (flow) subsidy through programs that provided subsidized interest or amortization payments. Also, where subsidy programs are limited by income criteria alone, families whose income levels qualify them for subsidies but whose wealth would allow them to acquire better housing may choose to underconsume housing in order to purchase at the sub-

sidized price. On the other hand, programs that incorporate wealth ceilings face the difficult task of ascertaining a proper wealth threshold. Ceilings that are too low can result in the exclusion of households whose wealth levels are above the threshold but whose wealth is insufficient to acquire non-subsidized housing from conventional housing markets.

For the most part, Black household wealth is lower than White counterparts with the same level of income. Thus, at least some portion of the underconsumption effect as well as the lower probability of ownership is likely due to lower Black household wealth. This is born out by the empirical evidence presented in Sections IV and V, where the inclusion of wealth in the estimating equations reduces the estimated extent of both of these effects. Clearly policies aimed at increasing ownership rates for minorities must carefully consider the importance of wealth and must provide a means to ameloriate the potentially adverse affect of inducing marginal buyers with low incomes and low wealth into owner-occupied housing.

The problem of low home ownership rates among minorities is further complicated by conditions in today's housing market. As housing prices continue to soar, the ability to own a home is rapidly becoming the luxury of those that have owned in the past. Home equity appreciation (aside from forced retirement plans and social security) is the primary means of wealth accumulation by middle income families. Few new households, whose wealth is small, can afford even lower cost new homes. In fact, even this market is increasingly becoming reserved for previous home owners. Ironically, family wealth will continue to be a major determinant of home ownership, while home ownership will remain a dominant means of wealth accumulation. Thus, while

incomes and home prices continue to rise, ownership rates are likely to continue to fall. Given that Blacks and minorities have much lower ownership rates to start with, it is these households that will be unable to take advantage of rapid housing price appreciation. Furthermore, as shown in Section III, even Blacks who own houses in Black areas are experiencing significantly less growth in home equities than Whites. Consequently, during the next decade it may be more difficult to increase ownership rates among Blacks and other minorities, even if discriminatory behavior in the housing market declines.

The Role of F.H.A. Mortgage Financing

Another interesting phenomenon discovered in this study was that the Black underconsumption of housing seems to be associated primarily within the "FHA" submarket. This finding is consistent with that found in Smith and Campbell (1974), though that study demonstrated that to some extent all households in the FHA submarket appear to underconsume housing.

There may be several reasons for this effect. As suggested in Smith and Campbell (1974), the demand for housing may be somewhat distorted by the FHA mortgage ceiling, causing households at the margin (of the ceiling) to consume less housing in order to receive more favorable FHA credit terms. If FHA mortgages are the only means of financing the purchase of a home for many low/moderate income Blacks, in order to get into the owner-occupied market, they may be induced to consume inferior quality housing merely because such housing can be acquired by FHA financing. Furthermore, FHA financing may allow "inferior" housing to be sold in the owner market. Given that

Blacks almost exclusively use FHA or VA financing, a majority of these marginal homes are subsequently bought by Blacks. In essence, the relationship between Black underconsumption and FHA financing may reflect the fact that FHA mortgages bring to the owner-occupied market families that could not buy owner occupied housing in any alternative way and would otherwise be forced to rent, while simultaneously allowing homes that would otherwise be rental property to be sold in the owner-occupied market.

As a primary tool to aid low/moderate income families, FHA insurance should avoid being so constructed that it leads to less than anticipated housing consumed. Special concern should also be given to the role of FHA programs play in effecting neighborhood change, since the predominance of FHA loans in an area is considered by many observers as positive evidence that "redlining" is occurring and is often taken as a leading indicator of neighborhood decline. It seems unlikely that such a strong position is warranted, but given the findings from this research plus current public perceptions, it seems imperative that further analysis investigate the role of FHA financing as it affects consumption patterns of both minorities and non-minorities.

Racial Segregation and Public Policy

Black households are not only residentially segregated, but are shown in this study to participate in a significantly different "housing market" than White households. Among other things, Blacks face different implicit prices for housing characteristics and appear to have a more restrictive set of housing types to choose from. If this is due to the

continuation of explicit discrimination and exclusion, then current fair housing programs that seek to open up housing opportunities to Blacks by preventing discriminatory behavior in the housing market will continue to be useful. However, if the observed differences in the housing market for Blacks is due to White prejudicial behavior in the absence of explicit discrimination (White exclusiveness and White flight), then standard fair housing activities may not be particularly effective. If the latter case is correct, then H.U.D. faces a difficult problem. In essence, H.U.D. must be willing to readdress the question of whether the problem of segregation and effective limitation on the supply of housing to minorities should be ignored, even if it occurs as a result of natural market forces where freedom of choice is being exercised by households of all races. In this case, White prejudices generate high White prices. Thus, Whites "pay" for their prejudice and their exclusiveness. Blacks choose not to pay to break it down. But while freedom of choice and open housing in the legal sense exists, it seems that a reasonably strong case can be made for policies that directly promote residential integration, if for no other reason that it will yield a broader degree of social integration and ameloriate a whole host of urban problems related to segregation. Even more important, however, the encouragement of integration may be the only effective way to truly open up housing to minorities who are now effectively limited in their housing choices, even if this limitation does not involve explicit discrimination.

While this research does not directly address issues involving the causes of segregation, many of the findings reported here are relevant. Such findings suggest that there indeed exists a reasonably high probability

that given the realities of today's housing market, Blacks may self-segregate. This does not mean that they prefer to live in all Black areas. Rather, it indicates that with strong White preferences to avoid integration, which have a depressing effect on housing prices in Black areas, most Black households do not find the marginal benefit of integration worth the premium they would have to pay to live in the higher cost all White areas.

It also appears that a key element to the success of integration as a means of opening up housing opportunities for all Blacks involves the behavior of the growing Black middle class. These are the Black households that appear to have the purchasing power to buy "neighborhood" quality, including that which is offered in predominantely White areas. Black middle class families that do break the segregation barrier appear indistinguishable from Whites in their housing consumption. Black families that can "afford" to penetrate White areas seem no longer restricted to the ghetto supply of housing. But, integration is achieved through alterations in the behavior of both Blacks and Whites. Black migration into dominately all White areas will lend itself to integration only if Whites accept the change and don't leave. Black households that can afford upper middle class housing in White areas are not perceived as a real threat to the status quo, since too few Black households with the income and wealth to purchase in the area exist to significantly alter the demographic mix and "tip" the neighborhood. On the other hand, moderate income White areas, into which substantial numbers of Black households can now afford to move, tend to be quickly depleted of its White population as Black households move in. Often this is accompanied by expectations of lower public services and of a general decline in neighborhood

amenities. Such a change in expectations will only widen the gap between White and Black housing price bids beyond that generated from the neighborhood discount Whites may now apply to the area because of their prejudice towards integrated areas. The ultimate result is that integration promoted by Fair Housing policies that primarily emphasize equal opportunity of access may actually be disstablizing, with the end result being "legal block busting."

Housing policies aimed at achieving integration need to keep several factors in mind. First, housing programs that only focus upon the plight of low income minorities are likely to foster either very token forms of integration or actually strengthen racial segregation. Integration policies that do not focus upon the Black middle class will be inconsistent with market realities to such a degree that the ultimate social objective will be unattainable. Furthermore, such programs are likely to impose terribly high social costs associated with the decline of neighborhoods experiencing racial change.

On the other hand, policies to promote integration may require subsidies to Blacks (even middle income Blacks) to allow them to buy in higher cost areas. This should be simultaneously accompanied by special support to integrated or transitional neighborhoods to ameliorate pressure for White flight. In other words, the most effective means to insure <u>stable</u> integrated areas may be to promote neighborhood oriented affirmative action policies to "strengthen" integrated areas. Such policies may, however, be difficult to politically implement, since they also entail focusing considerable aid to less economically depressed minorities. Here again, H.U.D. faces a policy

predicament involving a potential trade-off between the achievement of greater residential integration as opposed to the achievement of an improved housing environment for the nation's lowest income minorities. In reality, the former is much more related to housing policy issues involving race. The later is more of a question involving the housing status of all low income households. By pursuing the former, it seems plausible that all low income households will receive spillover benefits. Nonetheless, if integration efforts were to succeed to the point where Black neighborhood home prices are no longer discounted, this could have potentially adverse impacts on low income Blacks. Ironically, low income Blacks may actually benefit from the lower housing prices that result from segregation.

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APPENDIX

DATA FILES

Descriptions of the data files are presented below according to the dominant type of analysis for which they were used. This does not mean that they were used solely for that purpose. The basic information provided here includes the number of observations for each data file and a list with accompanying mean values of various key variables used in the empirical analyses discussed in Sections III through V.

I. PRICE DIFFERENTIALS: HEDONIC ESTIMATES

Chicago File SREA, Census Tract, NBHD Variables

1. Observations 1917

2. Key Variables

House Value	34,764
House Age	33.705
Sq. Feet	1,328
Lot Size	4,779
Brick	.712
Rooms	5.936
Baths	1.231
Garage X No. of Cars	1.246
Air Conditioning	.157

3. Use

Analysis of Price differences between areas of different racial composition

1970 Houston File: SREA, Census Tract, NBHD Variables

1. Observations 2112

2. Key Variables

House Value	17,995
House Age	12,839
Lot Size	9,637
Sq. Feet	1,546
Rooms	1.514
Baths	1.653
Air Conditioning	.521
Garage X No. of Cars	.880
White	.508
Integrated	.145
Border	.204
Black	.143

3. Use

Analysis of Rates of Housing Appreciation between areas of different racial composition.

I. PRICE DIFFERENTIALS: HEDONIC ESTIMATES (CONT'D)

1977 Houston File: SREA, Census Tract, NBHD Variables

1. Observations 3736

2. Key Variables

House Value	42,106
House Age	12.089
Lot Size	8.741
Sq. Feet	1.642
Rooms	6.678
Baths	1.809
Air Conditioning	.674
Garage X No. of Cars	1.579
White	.681
Integrated	.094
Border	.146
Black	.079

3. Use

Analysis of Price Differentials between areas of different racial composition.

Survey Data Only/All Owner Observations

1.	Observations	700
2.	Key Variables	
	House Value	39,580
	Income	22,600
	Wealth	25,100
	Black	.163
	Mexican-American	.039
	Married	.877
	Second Worker	.439
	Number of Children	1.130
	Expecting Larger Family	.079
	Expecting Smaller Family	.294
3.	Use	
	Demand for Housing	
	Black Underconsumption	

Survey Data Tied to SREA Data

1. Observations 639

2. Key Variables

House Value	37,653
Income	22,318
Wealth	24,250
Black	.138
Mexican-American	.039
Married	.875
Second Worker	.423
Number of Children	1.120
Expecting Larger Family	.077
Expecting Smaller Family	.304

3. Use

Demand for Housing
Test on comparability between stated house value and actual house value
Test differences between F.H.A. and conventional markets
Analysis of separate demand functions for housing attributes
Examine issue of whether "Blacks" pay more for housing regardless of location

Survey Data plus Special Survey

1. Observations 690

2. Key Variables

House Value	42,380
Income	26,090
Wealth	27,920
Black	.201
Mexican-American	.036
Married	.883
Second Worker	.439
Number of Children	1.150
Expecting Larger Family	.083
Expecting Smaller Family	.296

3. Use

Demand Analysis
Comparison of Underconsumption of Black households in Black areas versus those in White areas.

(Note: This is the basic survey data file plus the special survey of 52 Black households in virtually all white areas.

A separate data file was required since the special survey contained only a limited amount of information as opposed to the basic survey.)

III. TENURE DISTORTION: OWNER/RENTER ANALYSES

Pooled Renter/Owner Survey Data

1. Observations 858

2. Key Variables

Owners	.823
Income	20,592
Wealth	18,801
Black	.178
Mexican-American	.036
Married	.796
Second Worker	.403
Number of Children	1.070
Expecting Larger Family	.294
Expecting Smaller Family	.076
Previous Owner	.612

3. Use

Analysis of Tenure Choice

III. TENURE DISTORTION: OWNER/RENTER ANALYSES (CONT'D)

Representative Sample

1. Observations 3525

2. Key Variables

Owners	.587
Income	17,999
Wealth	9,174
Black	.199
Mexican-American	.066
Married	.640
Second Worker	.316
Number of Children	.963
Expecting Larger Family	.239
Expecting Smaller Family	.069
Previous Owner	.659

3. Use

Analysis of Tenure Choice

(Note: Since Logit Analysis is highly dependent upon the representativeness of the sample used, a sample created by multiples of the original data was created to conform more with the population characteristics of Harris Co. In other analysis a Tobit program that allows for explicit weighing was shown to produce similar results as those produced in this study.)

National Longitudinal Survey

1. Observations 684

2. Key Variables

Owner	.640
House Value (of owners)	17,703
Income	7,210
Wealth	6,158
Age of Household head	40,820
Second Worker	.440
Family Size	4.850
Black	.170

3. Use

Comparison Analysis of Primary Study of Owner/Renter choice that allows for interdependencies in the Expenditure and Tenure Decisions.