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**DISCRIMINATION IN QUALITATIVE ACTIONS
BY REAL ESTATE BROKERS**

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Abstract

Discrimination occurs when people in a particular class are systematically treated less favorably than other equally qualified people. This study focuses on racial and ethnic discrimination in qualitative actions by real estate brokers, such as showing a customer a housing unit that was advertised in the newspaper. The data come from the Housing Discrimination Study, which conducted over 2,000 fair housing audits of real estate brokers in 25 metropolitan areas in 1989. Each audit consists of a visit to a real estate agency by a white person and either a black or Hispanic person with similar socio-economic characteristics. Using Chamberlain's fixed-effects logit estimation, we develop a nationally representative measure of the incidence of discrimination in broker behavior and conduct hypothesis tests on the incidence and causes of discrimination. The results indicate widespread discrimination and support the hypotheses that brokers discriminate both out of personal prejudice and in response to the prejudice of present and future white clients.

Introduction

Racial discrimination in housing involves a choice by housing agents to treat racial and ethnic minorities less favorably than other customers. This paper presents evidence from the 1989 Housing Discrimination Study (HDS) concerning the extent to which this type of choice is made in the United States.¹ To be specific, this paper estimates the incidence of discrimination against African Americans and Hispanic Americans in qualitative actions taken by real estate brokers, such as showing an advertised unit to a customer or offering to help a customer find financing.² It also tests hypotheses about the causes of discrimination.

Many previous studies have used audit data to estimate the incidence of discrimination in housing. See Galster (1990a, 1990c), Page (1995), Roychoudhry and Goodman (1992, 1996), Turner and Mickelsons (1992), Wienk, Reid, Simonson, and Eggers (1979), and Yinger (1995). Methodological issues that arise in estimating the incidence of discrimination are discussed in Fix and Struyk (1993) and Ondrich, Ross, and Yinger (1995). As pointed out by Yinger (1986), audit-based tests of the hypothesis that discrimination exists must account for unobserved factors that audit teammates share. This paper is the first to use the Chamberlain (1980) fixed-effects logit technique, which is designed to account for such factors with a qualitative dependent variable. Tests of hypotheses about the causes of discrimination in housing have appeared in Galster (1990c), Page (1995), Roychoudhry and Goodman (1992, 1996), and Yinger (1986, 1991, 1995).³ This paper is the first to conduct them using data on housing agents' qualitative actions, for which the fixed-effects logit technique is well suited.

This research on discrimination in housing is part of a broader literature on the economics of discrimination, which examines alternative methods for studying discrimination and explores

discrimination in several different markets. Recent surveys cover research on discrimination in mortgage markets (Ladd forthcoming; Goering and Wienk 1996; Yinger 1995) and labor markets (Fix and Struyk 1993; Darity and Mason forthcoming).⁴

The paper is organized as follows. The first section introduces HDS, the second explains how to measure discrimination in qualitative actions by real estate brokers, and the third presents estimates of the incidence of discrimination against blacks and Hispanics in the home sales market. The fourth section introduces hypotheses about the causes of discrimination; it explains the principal hypotheses in the literature and shows how they can be tested with audit data. Estimation results appear in the fifth section, and the last section presents our principal conclusions.

The Housing Discrimination Study

According to the 1968 Fair Housing Act, discrimination exists whenever an individual receives unfavorable treatment in the housing market solely because he or she belongs to a “protected class.”⁵ This paper focuses on two protected classes: blacks, also called African Americans, and Hispanics. The distinction between blacks and whites is an example of a “racial” distinction, in which a superficial physical characteristic, in this case dark skin, gains social power thanks to a history of inter-group conflict and oppression.⁶ The distinction between Hispanics and non-Hispanic whites is an example of an “ethnic” distinction in which cultural differences, for example, in language, religion, or country of origin, gain social power through a nation’s history. In some parts of the United States, this distinction also has a “racial” dimension because many Hispanic people have dark skins. The Housing Discrimination Study was designed to determine whether people in either of these protected classes continue to encounter discrimination in

housing. This section provides an overview of the HDS audit methodology and of the types of real estate broker behavior in the HDS data.

HDS Audit Methodology

Each audit is conducted by two teammates, a white person and a member of a minority group, who are equally qualified for housing. To ensure equal qualifications, teammates are matched according to sex and age, given the same training concerning how to behave during an audit, and assigned similar socio-economic characteristics for the purposes of the audit.

Teammates successively visit a real estate broker (or landlord) to inquire about available housing and then independently record what they were told and how they were treated. Discrimination is defined to be systematically less favorable treatment of minority auditors.

The HDS audits were conducted in 25 United States metropolitan areas, which were selected to allow valid national estimates of unfavorable treatment. Black-white audits were conducted in 20 areas and Hispanic-white audits were conducted in 13 areas (with both types of audits in 8 areas) during May through August, 1989. Each audit was based on audit teammates' inquiries about the availability of an advertised housing unit, which was randomly selected from the major metropolitan newspaper. Audit teammates were assigned incomes and family characteristics that made them qualified for the advertised unit assigned to their audit.⁷ The total sample sizes were 1,081 for black-white sales audits and 1,076 for Hispanic-white sales audits.⁸ Because of the HDS sampling procedures, the results presented in this paper measure discrimination that qualified black and Hispanic home seekers can expect to encounter when they inquire about housing that is advertised in a major metropolitan newspaper.⁹

Types of Broker Behavior

This paper focuses on real estate broker behavior in two broad categories concerning the marketing of housing units that are for sale.¹⁰ The first category involves information about which housing units are available. Discrimination occurs when a broker withholds information about available units from a minority auditor but not from her white teammate. The second category involves broker actions that facilitate the sale of a unit. These actions include providing information about the terms and conditions of sale, assisting or encouraging the customer, and providing information about possible mortgages. A broker who treats minority customers less favorably in any of these actions further constrains their access to housing.

The types of broker behavior examined in this paper, which are listed in Table 1, can each be characterized as a qualitative action, such as a decision to show a customer the advertised unit. Because the paper focuses on qualitative actions, it excludes some types of broker behavior, such as showing different numbers of units to white and minority customers, for which discrimination has proven to be important. Furthermore, the methods employed here cannot determine whether some brokers discriminate in many actions or many brokers discriminate in a few actions.¹¹ Thus, the results in this paper should be interpreted as illustrative of the types of discrimination that can occur, but not as representative or comprehensive indicators of racial and ethnic discrimination in urban housing markets.

Discrimination in Qualitative Actions by Real Estate Brokers

The behavior considered here can be examined with a straightforward econometric procedure. This section explains that procedure and presents the basic estimates of the extent of discrimination.

Econometric Procedure

Discrete choices by housing agents can be characterized by the following simple model:

$$Pr(A_{av} = 1 | W, d, X, \beta, a) = F(dW_{av} + \beta X_{av} + a_a) \quad (1)$$

In this equation, a is the index for audit, v is the index for visit, and there are two visits (one by a minority auditor and one by a white auditor) for each audit. In addition, A_{av} equals one if the broker takes the action and zero otherwise; W_{av} equals one if the auditor is a white and zero otherwise; X is a vector of explanatory variables such as the auditor's age and the income assigned for the purposes of the audit; a_a is a fixed effect associated with the audit; and d and β are coefficients to be estimated.

Two aspects of this model deserve emphasis. First, d is a measure of discrimination, that is, of systematic favorable treatment of white auditors or, equivalently, systematic unfavorable treatment of minority auditors. A test for the significance of d is therefore a test of the null hypothesis that there is no discrimination. Second, the fixed effect represents unobserved factors that are shared by teammates and influence an agent's behavior. Because these factors may be correlated with observed variables, estimates that ignore the fixed effects may be subject to omitted variable bias.

To estimate equation (1), therefore, one must select a form for the F -function and account for the fixed effects. In the case of the well-known logit specification, a procedure for estimating a discrete choice model with two visits per audit and with fixed effects is provided by Chamberlain (1980). This involves estimating a discrete-choice model for the subset of audits in which the choice (broker's action) is different for the two visits. Audits in which A equals one for both teammates or equals zero for both teammates are dropped from the analysis. Thus, the model is transformed into a model of the probability that the broker will choose to take the action

for the white auditor but not the minority auditor, conditional on the fact that the teammates were treated differently.

The explanatory variables in Chamberlain's discrete choice model are the **differences** in the underlying variables for the white and minority auditors. This differencing procedure has a dramatic impact in the case of audits, because audits are explicitly designed so that most of the relevant explanatory variables are the same for the two teammates. In other words, most of the differenced X variables equal zero and, like the fixed effects, drop out of the analysis. Not all the X 's disappear, however. First, and most important, the white variable, W , does not cancel and in fact becomes the constant term in the new regressions. (The original constant term obviously disappears.) The auditors inevitably visit the real estate agency in a different order. Moreover, audit teammates' ages are not identical; neither are all the characteristics they are assigned nor the characteristics of the brokers they encounter. Thus, with the white visit labeled as 2 and the minority visit as 1, the Chamberlain approach is to estimate the logit model

$$Pr(A_{a2} & A_{a1} = 1 | A_{a1} \& A_{a2} = 1; d, (X_2 \& X_1), \beta) = F(d + \beta(X_{a2} \& X_{a1})). \quad (2)$$

The usual way of expressing the extent of discrimination for a qualitative variable is the share of audits in which a favorable action is taken for the white auditor minus the share in which that action is taken for the minority auditor. However, this approach does not account for observable differences between teammates, and therefore does not take advantage of the logit framework. In many contexts, logit coefficients can be translated into probability statements. This procedure is problematic with the Chamberlain method, because it requires information on the predicted probability for each observation, which depends on the unobserved (and unestimated) fixed effect.¹²

The approach taken in this study is to look at the ratio of the white and minority odds of favorable treatment. If P is the probability that an event will occur, then $P/(1-P)$ indicates the odds of the event. In our analysis, the odds ratio is the odds that a favorable action is taken for the white auditor divided by the odds that it is taken for the minority teammate. The conceptual experiment that is required to obtain an estimate of discrimination alone is one in which there are no differences across teammates in the X 's, so that differences in treatment are due entirely to minority status. With all teammate differences set to zero, the log of the odds ratio is simply d .

With the possible exception of gamblers, people are not used to thinking in terms of odds, let alone the log of an odds ratio. However, exponentiation transforms the log of the odds ratio into an odds ratio, and the relationship between the odds ratio and the underlying probabilities is relatively straightforward. Figure 1 shows this relationship under the assumption that the probability of a favorable action toward a minority is a fixed percentage of the probability of that action toward a white. In this case, the odds ratio increases both with P_w , the probability that a favorable action is taken for the white auditor, and with c , the percentage difference in this probability between whites and minorities. Hence, with an estimate of the odds ratio, one can determine the implied value of c at any given value of P_w . In Figure 1, for example, an estimated odds ratio of 2.0 and $P_w = 0.75$ imply that P_b is 25 percent below P_w or 0.5625.

Figure 2 shows this relationship under the assumption that the white and minority probabilities differ by a fixed amount, say d . Here again, an estimate of the odds ratio makes it possible to determine the value of d for any given value of P_w . Moreover, for any given value of d , the odds ratio reaches a minimum when $P_w = (1+d)/2$. Thus, for any estimate of the odds ratio, the maximum possible value of d can be determined by drawing a horizontal line in Figure 2 corresponding to that odds ratio and reading off the value of d associated with the curve that is

tangent to that line. With an estimated odds ratio of 3.5, for example, Figure 2 shows that the maximum possible value of d is 0.30. This maximum appears when P_w equals 0.65; in other words, if whites have a 65 percent chance of the favorable action, the chance for minorities is only 35 percent.

Accounting for Variation in Discriminatory Behavior

One important extension is to note that discrimination, d , may not be the same under all circumstances. Returning to equation (1), the impact of W on the probability that A_{av} equals 1 may depend on the X 's. In this case the equation is

$$Pr(A_{av} = 1 | W, d^*, X, \beta, \gamma, \alpha) = F(d^* W_{av} + \beta X_{av} + \gamma W_{av} Z_{a2} + \alpha_a), \quad (3)$$

where Z is the subvector of the X 's that might be associated with discriminatory behavior or, to put it another way, that might have different coefficients in the white and minority audits, and the coefficient of W , now d^* , no longer embodies the full effect of discrimination. Note that only the white values of the Z 's appear because the model already accounts for differences in the Z 's (and other elements of the X 's) across teammates. When a differencing procedure is applied to the explanatory variables in this model, the Z 's remain. To be specific, the logit model is

$$Pr(A_{a2} \& A_{a1} = 1 | A_{a1} \& A_{a2} = 1; d^*, (X_2 \& X_1), \beta, X_{av}, \gamma) = F(d^* \gamma W_{a2} + \beta(X_{a2} \& X_{a1})). \quad (4)$$

This extension is important because it allows one to test hypotheses about the causes of discrimination. In particular, if a hypothesis predicts that discrimination increases with a particular variable in Z , then the coefficient of that variable in equation (4) provides a test of that hypothesis. The key hypotheses about the causes of discrimination, and their links to the explanatory variables available in the HDS data set, are explained in the next section.

In equation (4), the average difference in treatment is estimated by $d^w + \bar{Z}$, where \bar{Z} is the vector of mean values for the Z 's for the white auditors. To collapse this estimate into the intercept, Z must be redefined as a deviation from its mean. If the HDS sample were nationally representative, the sample means could be used in this procedure. In fact, however, weighted means must be used to account for the HDS sampling plan. Thus, each Z variable (but not the control variables for teammate differences, which still do not affect the average difference in treatment) is expressed as a deviation from its weighted sample mean for white auditors. The final estimating equation is as follows, where a "w" superscript indicates a variable or parameter estimate affected by weighting.

$$Pr(A_{a2} & A_{a1} = 1 * A_{a1} | A_{a2} = 1; d^w, (X_2 & X_1), \beta, (X & \bar{X}^w), ?) = F\left(d^w + \bar{Z}^w | N(Z_{a2} & \bar{Z}^w) | BN(X_{a2} & X_{a1})\right) \quad (5)$$

In this equation, $d^w + \bar{Z}^w$ is an unbiased estimate of discrimination for the nation as a whole.

Teammate Differences

Equation (5) indicates that the estimation requires data on X 's that differ between teammates. Despite the steps taken to make teammates as similar as possible, audit teammates differ on the order in which they visit the agency, which is assigned randomly, and may differ on their own age or on the age, sex, or ethnicity of the broker who assisted them.¹³ Controls for all of these differences are included in the logit regressions. Because the differences tend to be small, except in the case of the order of visit, these variables usually are not statistically significant.

Estimation Results for the Incidence of Discrimination

Hypothesis tests for the existence of discrimination against black and Hispanic home purchasers are presented in Table 2 for each type of broker behavior in Table 1. In each case, the first entry is the estimated value of d^w , the second is the associated t-statistic, and the third is the number of observations, that is, the number of audits in which teammates were treated differently.

We can reject the null hypothesis of no discrimination at the two-tailed 5 percent level for every type of broker behavior in Table 2 except invitations to call the broker back for blacks, which is significant at the one-tailed 10 percent level, and queries about auditor income for Hispanics.¹⁴ In fact, one can reject the null hypothesis at the 1 percent level for most types of broker behavior.

Table 3, for discrimination against blacks, and Table 4, for Hispanics, investigate the economic significance of these basic results. The first two columns of these tables present the weighted shares of audits in which the action was taken for minorities and whites and the third column gives the difference between them. This difference provides a simple, nonparametric measure of discrimination, which can be compared with the subsequent logit measures. This measure, unlike the other measures in these tables, does not control for observable differences between teammates.

The fourth column presents the white/minority odds ratio for receiving the treatment, and the remaining columns present the probability approximations based on the odds ratio that were derived earlier. In particular, the fifth column contains the percentage (assumed to be fixed) by which the minority probability of receiving the treatment falls short of the white probability (or exceeds the white probability in the case of queries about income). The sixth column gives the (fixed) absolute or percentage-point gap between the white and minority probabilities of receiving

a treatment. The approximations in both of these columns are evaluated at the white probability in the first column.¹⁵ The last column gives the maximum percentage-point gap that is consistent with the estimated odds ratio.

For blacks, the simple nonparametric measure of difference in treatment in the third column ranges from 3.8 percent for invitations to call back to 11.3 percent for offers of financial assistance. In every case except queries about housing needs, these percentages are below, often far below, the odds-ratio-based measures that follow. The first odds-ratio measure in column five, which assumes a fixed percentage gap between whites and minorities, ranges from 8.5 percent for the availability of the advertised unit to 84.7 percent for queries about income. Thus, under the assumption of a fixed percentage gap, blacks are 8.5 percent less likely than whites to be told the advertised unit is available and 84.7 percent more likely than whites to be queried about their income. In contrast, the odd-ratio measure in column six, which assumes a fixed absolute gap between the white and minority probabilities, ranges from 4.6 percentage points for invitations to call back to 18.8 percentage points for queries about income. The calculations in column five tend to yield larger estimates when the base, which is in column one, is smaller, and the calculations in columns five and six tend to converge when that base approaches 100 percent, as in the last row. Finally, the last column reveals that regardless of the probability that the white will receive a treatment, the estimates are not consistent with an absolute white-black gap that exceeds 4.6 percent for invitations to call back or 21.2 percent for queries about income and the availability of the advertised unit.

The estimates of the extent of discrimination for Hispanics in Table 4 are similar, although higher for some types of broker behavior and lower for others.¹⁶ The nonparametric measure of differential treatment (third column) ranges from 0.9 percent for queries about housing needs to

11.8 percent for invitations to call back. As before, this measure is almost always below the odds-ratio based measures. Excluding results for queries about income, which show little difference between white and Hispanic auditors, the first odds-ratio-based measure (fifth column) indicates a probability of discrimination between 8.8 percent for queries about housing needs to 57.9 percent for a follow-up call to the auditor. The second odds-ratio-based measure (sixth column) indicates a probability of discrimination between 6.7 percent for queries about housing needs to 24.6 percent for making the advertised unit available. Not surprisingly, the estimates in columns five and six converge as the white probability in column one approaches 100 percent. The maximum possible probabilities in the last column range up to 35.5 percent for making the advertised unit available.

Overall, these results indicate that the probability of discrimination against blacks and Hispanics is high in magnitude, as well as statistically significant, for many types of broker behavior. The behaviors with the highest probabilities of discrimination include those with a significant impact on access to housing, such as making the advertised unit available and providing financial assistance. Although the probability results in Tables 3 and 4 are approximations, they do suggest that simple nonparametric measures, which do not control for observable differences between teammates, tend to understate the probability of discrimination.¹⁷

Testing Hypotheses about the Causes of Discrimination

This section presents the main hypotheses about the causes of discrimination and shows how they can be tested using (5). Tests are then carried out for the black-white and Hispanic-white sales audits.

Hypotheses about the Causes of Discrimination in Housing

Discriminatory behavior is illegal no matter what its specific causes. Policy makers may be able to design more effective legislation for combating discrimination, however, if they can determine why it persists. The literature, which is surveyed in Galster (1987) and Yinger (1986, 1995), contains three principal hypotheses about the causes of racial and ethnic discrimination in housing.

Broker Prejudice. White real estate brokers may be prejudiced against minorities, that is, these brokers may have a strong aversion to dealing with black and Hispanic customers. The *broker-prejudice hypothesis* is that some white brokers discriminate to satisfy their own personal prejudice against minorities.

This hypothesis cannot be tested directly without a measure of real estate brokers' prejudice, but it can be tested indirectly by determining whether discrimination varies with broker characteristics that could be associated with prejudice. In particular, recent surveys indicate that prejudice against blacks is higher among men than among women and higher in older cohorts than in younger ones (see Schuman, Steeh, and Bobo 1985). Thus, this hypothesis implies that discrimination will be lower if the broker is a woman or is relatively young.

This hypothesis also predicts that discrimination depends on the race or ethnicity of the broker. In particular, minority brokers are unlikely to be prejudiced against members of their own minority group, so this hypothesis predicts that, compared to white brokers, black brokers are less likely to discriminate against blacks and Hispanic brokers are less likely to discriminate against Hispanics.

In addition, this hypothesis would be supported by a finding that real estate brokers are less likely to discriminate against a minority couple when the wife does the shopping. A

customer's potential neighbors cannot possibly care whether the husband or the wife does the house shopping, but a prejudiced broker may prefer to deal with minority females than minority males. In the sales audits, virtually all auditors are assigned the role of a married person, so this hypothesis predicts that discrimination will be greater against male than against female auditors.

Finally, a broker may reveal relatively weak prejudice through actions he takes that are independent of the audit, such as locating his office in an integrated area or advertising units in either an integrated area or a central city. This possibility leads to a second type of prediction from the broker-prejudice hypothesis, namely that brokers taking one of the preceding actions are less likely to discriminate. A rejection of this type of prediction implies that broker actions do not reveal their prejudice or broker prejudice does not lead to discrimination—or both.

Customer Prejudice. The second hypothesis, called the *customer-prejudice hypothesis*, is that housing brokers discriminate to protect their actual and potential business with the group that supplies most of their business. A real estate broker whose business is concentrated in a prejudiced white neighborhood, for example, may refuse to show houses to black or Hispanic customers for fear of alienating current or potential white house seekers and house sellers.

Different incentives face real estate brokers who operate in neighborhoods where blacks or Hispanics already live or are arriving in large numbers. These brokers do not have an economic incentive to discriminate because white customers can no longer blame any individual broker for opening the door to minorities, and many if not most of the broker's potential customers are minority house seekers. Moreover, these brokers may be able to increase their commissions by encouraging housing turnover and selling to minorities.

Prejudiced white customers are likely to be particularly concerned about minority neighbors in circumstances that might lead to neighborhood tipping, which is said to occur when a neighborhood turns from largely white to largely minority.¹⁸ Because one minority neighbor will not scare whites away, tipping is unlikely to occur in a largely white neighborhood. In contrast, an integrated neighborhood may be near the so-called tipping point, so that the addition of another minority household may initiate a change in neighborhood racial or ethnic composition. The customer-prejudice hypothesis therefore implies that discrimination could be more likely when the broker operates in an integrated neighborhood than when he operates in a white neighborhood.

Tests of this hypothesis face two problems. First, it is not possible to determine precisely which groups make up a broker's actual and potential customers. In the HDS data set, the two best indicators of a broker's actual and potential clients are the racial and ethnic compositions of the neighborhoods in which the broker's office and the advertised housing unit are located.¹⁹ Second, the HDS data set does not reveal which integrated neighborhoods are actually in danger of tipping. As a result, the customer-prejudice hypothesis does not indicate whether discrimination will be higher or lower when the broker's office or the advertised unit is in an integrated area. However, customer prejudice is the only one of the three main hypotheses that is consistent with higher discrimination in integrated areas.

In addition, the customer-prejudice hypothesis predicts that brokers are more likely to discriminate against minorities who have characteristics that are particularly likely to upset their prejudiced white customers. Two such characteristics are income and number of children (see Schuman et al. 1985; Yinger 1995). Whites appear to be more comfortable with blacks who have relatively high incomes. Moreover, whites' aversion to black neighbors appears to be magnified

when children, and hence school integration, are involved. The same issues may arise in whites' attitudes toward Hispanics. The customer-prejudice hypothesis predicts, therefore, that discrimination will decline as income increases and that there will be more discrimination against minority families with children than those without children.²⁰

It is not possible to distinguish between the broker-prejudice and the customer-prejudice hypotheses for all auditor characteristics. In particular, either brokers or their white customers may have stronger prejudice against younger than older blacks and Hispanics, against darker-skinned than lighter-skinned Hispanics, or against Hispanics with heavier accents.

The customer-prejudice hypothesis also predicts that large real-estate agencies, which have a broader customer base, will discriminate less than small agencies, which may depend for their business on attracting clients from a few neighborhoods. The HDS data set does not directly measure agency size, but it does indicate the maximum number of agency representatives encountered by either auditor during an audit. We use this maximum as a rough measure of agency size. For both the black-white and Hispanic-white audits, this variable reaches a maximum of 8 with a mean of about 1.75.

Moreover, a broker who employs a multiple listing service (MLS) may discriminate less because he can steer minority customers to locations where their presence will not threaten his reputation.²¹ In this study, we do not have information on membership in an MLS, but we do know whether a broker used an MLS directory to identify housing for either auditor. An MLS directory was used by 44 percent of the brokers in the black-white audits and by 40 percent of the brokers in the Hispanic-white audits. An additional possibility along these lines is that older brokers may be more likely to work in established agencies and therefore be less likely to discriminate. (This prediction is the opposite of that based on the broker-prejudice hypothesis.)

Finally, brokers with many units to show have the ability to advertise the one that they are most willing to sell to minorities and keep closer control over the others. The customer-prejudice hypothesis predicts, therefore, that discrimination in showing the advertised unit will be lower when similar units are available.²²

Brokers' Perceptions about Customers' Preferences. The third hypothesis is that real estate brokers discriminate in their attempt to match each customer with the neighborhood they believe that customer would prefer. According to this *perceived-preference hypothesis*, real estate brokers believe that minority customers prefer housing in integrated or largely minority neighborhoods, so that discrimination is most likely to occur when available units are in a largely white neighborhood. This attempt to satisfy perceived customer preferences may appear innocuous, but brokers' perceptions may be based on inaccurate stereotypes, and it is still illegal for a broker to discriminate against minority customers even if he believes that he is doing what those customers want.

Note that this hypothesis focuses on the neighborhood in which a housing unit is located. The neighborhood in which the broker's office is located has no direct link to this hypothesis, but it may have an indirect link because brokers with offices in white areas may be more likely to have housing units in white areas. For the purposes of this study, the most specific prediction of the perceived-preference hypothesis is that discrimination in showing the advertised unit will be higher when its neighborhood is white instead of integrated.

One way to interpret this hypothesis is to say that real estate brokers avoid investing time in interactions that they perceive are unlikely to pay off, such as showing blacks houses in white neighborhoods. This type of incentive also may show up elsewhere. Suppose, for example, that brokers believe that minority customers looking for housing in a central city will inevitably end up

looking in a minority neighborhood and that there is redlining, defined as an unwillingness on the part of lenders to grant mortgages in minority neighborhoods. In this case, brokers may be less likely to offer assistance in finding a mortgage to minority customers when the advertised unit is in a central city. Similarly, brokers may discriminate more against minorities who are just qualified for their housing than against those who are highly qualified because they believe that only the latter group will be able to obtain a mortgage.

Explanatory Variables in the HDS Data

The specific explanatory variables used to test these three hypotheses are presented in Table 5. These are the variables that are interacted with W in equation (3) and that make up the Z vector in equation (5). Several of the variables in this table are not connected to a specific hypothesis, but instead make it possible to determine whether discrimination varies by metropolitan area, over time, or by type of housing.

Most of these variables are self explanatory, but a couple require comment. First, Turner, Edwards, and Mickelsons (1991) found that over two-thirds of the houses shown to HDS auditors were in census tracts that were less than 10 percent minority.²³ As a result, a white neighborhood is defined as one with no more than 5 percent minority residents and an integrated neighborhood as everything else. (The sensitivity of the fixed effects logit results to the choice of percentage minority defining a white neighborhood is examined in Appendix C.) This definition is used to determine whether the broker's office and the advertised unit are in a white or integrated census tract, and four dummy variables are then defined by a two-by-two table with rows referring to the tract containing broker's office and columns referring to the tract containing the advertised unit. For example, the variable, OIAW, which is the left-out category, identifies an

audit in which the broker's office was in an integrated neighborhood and the advertised unit was in a white neighborhood.

Second, characteristics of the agency cannot be observed directly. The number of people encountered in the office by the white or the minority teammate, whichever is greater, is used as a proxy for the size of the agency, and agencies belonging to an MLS are considered to be those in which the broker serving either audit teammate made use of an MLS directory.

Third, each audit team was assigned a family income large enough to ensure that the auditors were clearly qualified for the randomly selected advertisement that defined the audit. The income assignment process did not follow a simple rule, however, so another variable indicates the ratio of income to the listing price of the advertised housing unit.

Estimation Results for the Causes of Discrimination

Fixed-effects logits for the black-white and Hispanic-white sales audits using all the applicable explanatory variables were carried out for each type of broker behavior described in Table 1.²⁴

Black-White Audits

In the black-white audits, three regressions uncover several factors with a significant impact on discriminatory behavior. These regressions are: the broker asked the customer to call back, the broker asked the customer about his or her income, and the advertised unit was inspected. Regression results for these three dependent variables are presented in Table 6.

In the "call back" regression, four variables connected to hypotheses are statistically significant at the 5 percent level. First, female auditors encounter less discrimination than male auditors.²⁵ This result supports one version of the broker-prejudice hypothesis.

The other three variables involve neighborhood racial composition. The coefficients of OWAW and OIAI are positive and highly significant and the coefficient of OWAI is positive and significant at the one-tailed 5 percent level. These positive coefficients indicate more discrimination in these types of circumstances than for the omitted category, namely OIAW. In qualitative terms, these results are reasonably robust to small changes in the racial composition that separates white and integrated neighborhoods for the advertised unit or the broker's office.²⁶

These results imply, first of all, that discrimination is higher when a broker who advertises a unit in a white area has an office in a white instead of an integrated neighborhood. This result is consistent with all three hypotheses. It could indicate that brokers with relatively high prejudice, and hence a relatively high proclivity to discriminate, locate their offices in white areas; or that brokers whose main business is in white areas protect their reputation with white clients by discriminating; or that brokers located in white areas tend to have listings in white areas that they believe will not be acceptable to minority customers.

Second, these results imply that the discrimination is not significantly lower when a broker with an office in a white area advertises a unit in an integrated instead of white area.²⁷ This result is consistent with the customer-prejudice hypothesis, which recognizes that selling to blacks in border areas may initiate tipping and thereby threaten a broker's established business. This evidence for the customer-prejudice hypothesis would be much stronger, of course, if neighborhoods in danger of tipping could be identified. This result also runs counter to the second type of prediction from both the broker-prejudice hypothesis, which implies less discrimination by brokers willing to advertise units in integrated neighborhoods, and contradicts the perceived-preference hypothesis, which implies that brokers are more willing to show blacks houses in integrated than in white neighborhoods.

Third, these results indicate that discrimination is significantly higher when the broker's office is in an integrated area and the advertised unit is in an integrated instead of a white neighborhood.²⁸ This result also is consistent with the customer-prejudice hypothesis. Brokers with an established business in an integrated area need not worry about introducing blacks into a white neighborhood, but they may be concerned about initiating tipping in the integrated neighborhoods in which they operate. As before, this result might be stronger if the likelihood of tipping could be measured. This result provides further evidence against the second type of prediction from the broker-prejudice hypothesis and the predictions of the perceived-preference hypothesis. According to these hypotheses, brokers who are willing to list houses in an integrated area should have relatively low prejudice, and hence low discrimination, and brokers with units to show in integrated areas should assume that these units are desirable to minority customers.

A query about a customer's income is interpreted as a negative treatment, so the coefficients for the second regression in Table 6 are predicted to have the opposite signs of the coefficients for the other regressions. Thus, the results for this regression indicate that older brokers are more likely to discriminate than are younger brokers, and male brokers more likely than female brokers. Both these results support the broker-prejudice hypothesis. In addition, queries about income decrease as family income increases, a result that supports the customer-prejudice hypothesis.²⁹

The third regression in Table 6 involves the inspection of the advertised unit. As predicted by the customer-prejudice hypothesis, older auditors are less likely to encounter discrimination and discrimination is less likely in larger agencies. Discrimination also is not significantly different when the advertised unit is in an integrated or a white neighborhood, a result that contradicts the

broker-prejudice hypothesis (based on the second-type of predictions) and the perceived-preference hypothesis.

Although not reported in Table 6, the regressions also include dummy variables for sites and for months. Many of the site variables are statistically significant, but the patterns are not the same for every type of broker behavior. For example, seven sites have positive and significant coefficients (and none has a negative and significant coefficient) for invitations to call back, indicating that seven sites have more discrimination in this behavior than does New York, the omitted site. In contrast, the only significant site variables for inspections of the advertised units are four negative ones.

For the results of other regressions, see Appendix A.

Hispanic-White Audits

The most revealing Hispanic-white estimation results, which are presented in Table 7, are for broker offers of financial assistance and for whether the advertised unit was available. Results for the other dependent variables are presented in Appendix B. In the case of financial assistance, brokers are less likely to discriminate against Hispanics with heavy accents,³⁰ which discounts the role of language differences in discrimination, and older brokers are less likely to discriminate than younger brokers, which supports the view that more established brokers discriminate less. In addition, brokers discriminate more when they have more flexibility, as measured by the availability of units similar to the advertised unit, and when they expect redlining, as indicated by the location of the advertised unit in a central city.

In the decision to make the advertised unit available, discrimination is more likely when the advertised unit is in an integrated neighborhood than when it is in a white neighborhood. This is consistent with the customer-prejudice hypothesis but directly contradicts the broker-prejudice

and perceived-preference hypotheses. Moreover, as in the previous estimation, discrimination depends on whether similar units are available and whether the advertised unit is in a central city, but now the effects are negative. As predicted by the customer-prejudice hypothesis, brokers are less likely to discriminate in showing the advertised unit when similar units are available; they are also less likely to discriminate in showing the advertised unit when it is in a central city, a result that is consistent with all three hypotheses.³¹

Virtually all the site variables have negative signs in the Hispanic-white audits, indicating more discrimination in the left-out site, New York, than elsewhere, but the sites with statistically significant coefficients (none of which have positive signs) vary from one regression to the next. Four site variables have negative, significant signs in each of the two regressions in Table 6, for example, but only the Chicago variable is significant in both regressions.

Logits for other dependent variables contain additional results. These can be found in Appendix B.

Summary

Overall, these results reveal the complexity of discriminatory behavior. They show that discriminatory behavior is influenced by variables representing both broker prejudice and the economic incentives facing brokers that build on white customer prejudice. There is no indication, however, that brokers reveal their prejudice through their office-siting and advertising decisions. The results also uncover significant variation across sites that differs from one type of discriminatory behavior to the next. Moreover, they indicate that broker and customer prejudice do not explain a large share of the variation in any type of discriminatory behavior, that each type of discriminatory behavior has a different set of causes, and that any given type of discriminatory behavior may have different causes when practiced against a different minority group.

Conclusions

These results provide strong evidence that real estate brokers often choose to discriminate against African Americans and Hispanic Americans. In those aspects of a housing transaction considered here, the probability that a broker will take a favorable action toward a white customer is significantly higher than the probability he will take the same action toward a black or Hispanic customer. Title VIII of the 1968 Civil Rights Act (also known as the Fair Housing Act) has by no means eliminated racial and ethnic discrimination in housing.

The results in this paper also indicate that discrimination does not have a single cause or the same set of causes for each type of broker action. In the broker actions considered here, discrimination appears to be influenced by the prejudice of brokers themselves, by brokers' attempts to protect their established business with prejudiced white clients, and by factors that cannot be observed. Discrimination in other broker actions might have different causes.

This complex set of causes indicates that a wide-ranging program to combat discrimination is needed. This program must include educational efforts to weaken prejudice and to train real estate brokers, stronger penalties to combat brokers' economic incentives to discriminate, and enforcement strategies that focus on the locations where discrimination is most likely to occur.³² Stronger enforcement powers for the U.S. Department of Housing and Urban Development were included in the 1988 amendments to the Fair Housing Act. These amendments were implemented, during the same period when the HDS data were being collected, so the HDS results cannot shed light on the effectiveness of the new provisions. The results presented here do reveal, however, that HUD's new enforcement tools need to be adequately funded and vigorously enforced.

Appendix A

Black-White Audits: Estimation Results for Other Dependent Variables

The logit results for all eight dependent variables are reproduced in Table A-1. The results of regressions omitted from the main text sometimes support the conclusions reached in the main text. Female auditors encounter significantly less discrimination in the receipt of follow-up calls and in offers of financial assistance, and female brokers discriminate significantly less on follow-up calls. These two results support the broker-prejudice hypothesis. When the advertised unit is not available for either auditor, discrimination in queries about housing needs is higher when the broker's office is in an integrated tract. This result provides additional weak support for the customer-prejudice hypothesis. Finally, the coefficient of OWAW is positive and highly significant in the regression for whether the advertised unit is available, a result that supports all three main hypotheses.

Table A-1. Black-White Audits Complete Results

Variable	Broker Called Back Auditor		Broker Asked About Income		Broker Offered Financial Assistance		Broker Made Follow-Up Call	
	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
INTERCEPT	0.186	1.411	-0.890	-4.987	0.705	4.279	0.655	3.016
BROAGE	-0.019	-1.665	0.040	2.574	0.003	0.238	-0.023	-1.392
BROFEM	0.224	0.943	-0.551	-1.680	-0.456	-1.494	-0.348	-0.937
BROBLK	1.802	1.552	1.441	1.310	-1.770	-1.504	0.451	0.436
NUMPEOP	0.070	0.660	0.228	1.628	0.163	1.395	0.082	0.588
MLS	-0.302	-1.230	-0.526	-1.554	-0.043	-0.155	-0.692	-1.793
AUDFEM	-0.487	-2.062	-0.285	-0.925	-0.506	-1.863	-0.734	-2.096
AUDAGE	0.017	0.951	0.013	0.505	-0.005	-0.254	-0.014	-0.549
AUDCHLD	0.087	0.284	-0.089	-0.241	-0.326	-0.952	0.279	0.607
PREVOWN	-0.115	-0.441	-0.157	-0.429	0.350	1.213	-0.526	-1.372
AFAMINC	0.004	0.932	0.010	1.813	-0.008	-1.819	0.007	1.470
INC/VAL	0.019	0.042	-1.218	-1.152	-0.641	-0.884	-0.497	-0.533
OWAW	1.069	2.459	-0.818	-1.289	-0.733	-1.439	0.309	0.496
OWAI	0.770	1.767	-0.597	-0.964	-0.566	-1.101	0.217	0.352
OIAI	1.042	2.452	0.045	0.073	-0.315	-0.609	0.029	0.047
OWNOAD	0.848	1.334	-0.242	-0.286	-1.361	-1.618	1.115	1.136
OINOAD	-0.131	-0.201	0.668	0.855	0.428	0.531	1.119	1.128
SIM	-0.334	-1.244	-0.457	-1.174	0.043	0.133	-0.146	-0.329
CONDO	0.198	0.602	0.030	0.072	0.545	1.342	0.815	1.639
CCITY	0.072	0.160	-0.425	-0.701	-0.486	-1.056	0.744	1.234

Table A-1. Continued

Variable	Broker Asked About Needs		Broker Made Advertised Unit Available		Auditor Inspected Advertised Unit		Auditor Inspected a Similar Unit	
	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
INTERCEPT	0.318	1.991	0.860	2.971	0.607	1.992	0.690	3.331
BROAGE	0.018	1.282	-0.005	-0.235	0.002	0.102	-0.010	-0.657
BROFEM	0.130	0.481	-0.245	-0.537	0.030	0.065	0.227	0.694
BROBLK	-0.520	-0.473	1.207	0.800	2.599	1.563	-0.080	-0.071
NUMPEOP	0.054	0.454	-0.055	-0.267	-0.499	-2.244	-0.162	-1.413
MLS	-0.518	-1.765	0.650	1.190	-0.157	-0.331	0.301	0.953
AUDFEM	-0.223	-0.850	0.312	0.676	0.419	0.939	0.186	0.650
AUDAGE	0.014	0.698	0.005	0.155	-0.088	-2.612	0.012	0.573
AUDCHLD	0.615	1.659	-0.010	-0.019	-0.574	-0.879	-0.001	-0.001
PREVOWN	0.115	0.376	-0.192	-0.398	-0.419	-0.841	0.435	1.296
AFAMINC	-0.007	-1.592	-0.009	-1.406	-0.001	-0.124	-0.003	-0.692
INC/VAL	-0.314	-0.787	-1.422	-0.978	-0.268	-0.580	-0.417	-0.766
OWAW	-0.018	-0.037	2.059	2.143	1.184	1.311	---	---
OWAI	-0.335	-0.653	0.856	0.954	-0.015	-0.016	---	---
OIAI	0.180	0.396	0.840	1.242	0.320	0.369	---	---
OWSW ^a	---	---	---	---	---	---	-0.480	-0.723
OWSI ^b	---	---	---	---	---	---	0.090	0.155
OISI ^c	---	---	---	---	---	---	0.159	0.289
OWNOAD	0.453	0.615	---	---	---	---	---	---
OINOAD	1.751	2.119	---	---	---	---	---	---
SIM	0.151	0.494	-0.775	-1.191	-0.421	-0.817	---	---
ADV ^d	---	---	---	---	---	---	0.152	0.421
CONDO	-0.001	-0.002	1.005	1.397	-1.635	-1.693	-0.298	-0.747
CCITY	0.494	0.971	-0.107	-0.116	0.723	0.812	0.493	0.838

^aOffice in white tract; similar unit in white tract.

^bOffice in white tract; similar unit in integrated tract.

^cOffice in integrated tract; similar unit in integrated tract.

^dAdvertised unit inspected.

Appendix B

Hispanic-White Audits: Estimation Results for Other Dependent Variables

As Appendix A did for the black-white audits, this appendix presents all eight logit results for the Hispanic-white audits. Auditors with children encounter less discrimination in invitations to call back, a result that contradicts one prediction of the customer-prejudice hypothesis. Female auditors and dark-skinned auditors encounter more discrimination in queries about income.³³ The former results supports the view that real estate brokers have negative stereotypes about Hispanic women and the second reveals that skin color sometimes plays an important role in the way Hispanics are treated.³⁴ In the provision of follow-up calls, older auditors discriminate more than do younger auditors, which supports the broker-prejudice hypothesis.³⁵ In addition, larger agencies discriminate less in inspections of the advertised unit, as predicted by the customer-prejudice hypothesis. Finally, there is less discrimination in showing units similar to the advertised units if the broker is Hispanic, which supports the broker-prejudice hypothesis, and if the advertised unit is a condominium.

Table B-1. Hispanic-White Audits Complete Results

Variable	Broker Called Back Auditor		Broker Asked About Income		Broker Offered Financial Assistance		Broker Made Follow-Up Call	
	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
INTERCEPT	0.479	3.508	0.005	0.029	0.306	1.954	1.338	4.766
BROAGE	-0.009	-0.716	-0.030	-1.901	-0.042	-2.841	0.008	0.343
BROFEM	0.011	0.049	---	---	-0.161	-0.582	0.027	0.066
BROHIS	0.163	0.338	-0.807	-1.168	-1.042	-1.569	-0.159	-0.118
NUMPEOP	0.002	0.018	---	---	-0.074	-0.750	-0.046	-0.303
MLS	0.071	0.304	-0.038	-0.129	-0.330	-1.196	0.226	0.568
AUDFEM	0.394	1.824	-0.680	-2.514	-0.171	-0.630	-0.365	-0.884
AUDAGE	0.031	1.903	---	---	0.033	1.782	0.074	2.095
AUDCHILD	-0.611	-2.413	-0.185	-0.574	-0.227	-0.729	0.353	0.721
AUDDARK	0.675	1.707	-1.200	-2.437	0.462	0.989	-1.203	-1.622
AUDHEAVY	-0.051	-0.158	-0.628	-1.555	-0.718	-1.968	-0.070	-0.122
AUDBOTH	-0.769	-1.587	0.927	1.579	-0.527	-0.917	1.466	1.667
PREVOWN	-0.225	-0.926	-0.539	-1.731	0.109	0.352	-0.912	-1.800
AFAMINC	-0.001	-0.240	0.000	0.125	-0.007	-1.466	-0.001	-0.117
INC/VAL	0.075	0.226	0.163	0.491	0.026	0.099	2.445	1.387
OWAW	-0.506	-0.862	0.986	1.298	-0.464	-0.570	0.764	0.771
OWAI	0.112	0.197	-0.431	-0.595	-0.510	-0.678	-0.731	-0.825
OIAI	0.091	0.175	-0.123	-0.177	-0.582	-0.817	-0.592	-0.715
OWNOAD	-0.427	-0.441	-0.815	-0.786	0.917	0.872	-0.463	-0.402
OINOAD	0.278	0.439	0.360	0.430	0.966	1.141	1.790	1.470
SIM	-0.052	-0.198	0.373	1.064	0.754	2.251	1.067	2.083
CONDO	0.236	0.771	-0.340	-0.851	0.033	0.083	0.046	0.085
CCITY	-0.307	-0.999	0.588	1.608	1.048	2.530	-1.066	-1.044

Table B-1. Continued

Variable	Broker Asked About Needs		Broker Made Advertised Unit Available		Auditor Inspected Advertised Unit		Auditor Inspected a Similar Unit	
	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
INTERCEPT	0.346	1.983	1.483	2.442	0.784	2.763	0.774	2.808
BROAGE	-0.008	-0.576	-0.013	-0.457	-0.023	-0.955	0.003	0.172
BROFEM	0.254	0.867	-0.695	-1.373	-0.529	-1.219	0.177	0.531
BROHISP	-0.818	-1.433	-0.705	-0.710	-0.725	-0.941	-1.802	-1.983
NUMPEOP	-0.125	-1.011	-0.420	-1.910	-0.399	-2.391	0.065	0.573
MLS	-0.055	-0.184	0.493	1.012	0.123	0.308	0.029	0.089
AUDFEM	-0.371	-1.202	-0.270	-0.506	-0.153	-0.382	-0.241	-0.723
AUDAGE	0.012	0.567	0.027	0.592	-0.045	-1.548	0.009	0.405
AUDCHILD	-0.161	-0.441	0.143	0.249	-0.740	-1.374	-0.440	-1.125
AUDDARK	0.385	0.745	-0.060	-0.062	0.542	0.751	0.624	1.300
AUDHEAVY	-0.314	-0.785	0.848	1.201	1.072	1.821	-0.194	-0.456
AUDBOTH	0.012	0.018	-0.142	-0.130	-0.856	-0.934	-0.922	-1.391
PREVOWN	0.052	0.159	0.002	0.003	0.712	1.587	-0.392	-1.125
AFAMINC	0.006	1.165	-0.005	-0.583	-0.004	-0.497	-0.001	-0.288
INC/VAL	-0.286	-0.378	-0.091	-0.082	0.394	0.583	0.920	1.170
OWAW	-1.065	-1.384	1.807	1.702	1.242	1.430	---	---
OWAI	-0.270	-0.375	1.801	1.952	0.725	0.852	---	---
OIAI	-0.292	-0.445	3.840	4.884	0.479	0.665	---	---
OWSW ^a	---	---	---	---	---	---	0.447	0.388
OWSI ^b	---	---	---	---	---	---	-0.148	-0.143
OISI ^c	---	---	---	---	---	---	0.176	0.175
OWNOAD	-0.657	-0.599	---	---	---	---	---	---
OINOAD	0.568	0.679	---	---	---	---	---	---
SIM	-0.821	-2.604	-1.778	-2.651	-0.328	-0.644	---	---
ADV ^d	---	---	---	---	---	---	-0.822	-1.909
CONDO	-0.128	-0.329	-1.177	-1.513	-0.481	-0.602	-1.484	-3.066
CCITY	-0.990	-2.064	-2.168	-2.641	0.416	0.768	0.607	1.344

^aOffice in white tract; similar unit in white tract.

^bOffice in white tract; similar unit in integrated tract.

^cOffice in integrated tract; similar unit in integrated tract.

^dAdvertised unit inspected.

Appendix C

The Sensitivity of Logit Estimates to Definition of Minority Neighborhood

Tables C-1 and C-2 both present fixed effects logit estimates of the “call back” regression coefficients for the black-white audits. Table C-1 allows the minimum minority composition for the advertised unit to be considered in a minority neighborhood to vary, holding the definition for neighborhood composition of the agent’s office constant at 5 percent. The first two columns reproduce the results of Table 6, while the remaining ten columns allow the minimum minority composition to vary between 3 and 10 percent. Except for the indicators giving the combinations of minority composition for agent’s office and advertised unit, the results appear fairly robust. Among the minority composition indicators, the coefficients significant at the 5 percent level based on a two-tailed test, OWAW and OWAI, lose their significance with even small departures from the 5 percent minority composition definition.

A similar situation occurs in Table C-2, where the minimum minority composition for the agent’s office to be considered in a minority neighborhood is allowed to vary. As the minimum minority percentage moves from 3 to 10 percent, most of the results are robust, except for the minority composition combinations. OWAW and OWAI both lose significance at the 5 percent level when minimum minority composition is decreased from 5 to 4 percent. When minimum minority composition is increased from 5 percent to 7.5 percent, significance at the 5 percent level is retained for OWAW. The movement to 10 percent makes the OWAW coefficient insignificant. For OWAI, 5 percent significance is retained when the minimum minority composition is increased from 5 to 6 percent. However, a further increase in minimum minority composition to 7.5 percent causes OWAI to lose its significance.

Table C-1. Call Back Regression Results for Black-White Audits

	Minority Percentages ^a											
	5.0		10.0		7.5		6.0		4.0		3.0	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
INTERCEPT	0.186	1.411	0.191	1.454	0.188	1.434	0.195	1.486	0.192	1.456	0.195	1.483
AGNTAGE	-0.019	-1.667	-0.020	-1.784	-0.020	-1.800	-0.019	-1.721	-0.019	-1.748	-0.019	-1.745
AGNTFEM	0.224	0.943	0.230	0.970	0.219	0.926	0.234	0.989	0.226	0.953	0.221	0.937
AGNTBLK	1.802	1.552	1.749	1.520	1.753	1.527	1.736	1.499	1.725	1.491	1.740	1.510
NUMPEOP	0.070	0.660	0.060	0.565	0.075	0.712	0.068	0.641	0.062	0.583	0.067	0.639
MLS	-0.302	-1.231	-0.328	-1.339	-0.339	-1.385	-0.329	-1.345	-0.307	-1.256	-0.311	-1.277
AUDAGE	0.017	0.950	0.013	0.744	0.015	0.828	0.016	0.906	0.018	1.000	0.017	0.933
AUDFEM	-0.487	-2.061	-0.505	-2.139	-0.494	-2.095	-0.492	-2.090	-0.482	-2.049	-0.477	-2.032
AUDCHLD	0.087	0.284	0.048	0.159	0.060	0.197	0.098	0.319	0.052	0.170	0.037	0.123
PREVOWN	-0.115	-0.441	-0.107	-0.412	-0.118	-0.457	-0.137	-0.527	-0.128	-0.493	-0.116	-0.447
AFAMINC	0.004	0.931	0.003	0.886	0.003	0.873	0.004	1.063	0.004	1.050	0.004	1.005
INC/VAL	0.019	0.042	-0.022	-0.047	0.051	0.109	0.035	0.074	0.018	0.040	0.010	0.021
OWAW	1.069	2.460	0.482	1.475	0.381	1.088	0.739	1.909	0.867	1.749	0.667	1.210
OWAI	0.770	1.767	-0.214	-0.522	-0.172	-0.435	0.471	1.138	0.864	1.767	0.664	1.236
OIAI	1.042	2.452	0.194	0.622	-0.001	-0.002	0.670	1.818	0.903	1.816	0.604	1.108
OWNOAD	0.848	1.334	0.282	0.476	0.170	0.281	0.590	0.956	0.766	1.146	0.582	0.830
OINOAD	-0.131	-0.201	-0.930	-1.608	-1.067	-1.786	-0.488	-0.791	-0.235	-0.337	-0.493	-0.672
SIM	-0.334	-1.244	-0.292	-1.097	-0.282	-1.063	-0.307	-1.155	-0.345	-1.284	-0.318	-1.187
CONDO	0.198	0.602	0.188	0.575	0.185	0.564	0.213	0.648	0.175	0.532	0.162	0.496
CCITY	0.072	0.160	0.268	0.600	0.249	0.561	0.147	0.328	0.085	0.188	0.133	0.297

^aMinority Percent indicates the minimum minority composition for the advertised unit to be considered in a minority neighborhood, holding the minimum agent's office composition at 5 percent.

Table C-2. Call Back Regression Results for Black-White Audits.

	Minority Percentages ^a											
	5.0		10.0		7.5		6.0		4.0		3.0	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
INTERCEPT	0.186	1.411	0.198	1.511	0.193	1.468	0.198	1.507	0.192	1.465	0.192	1.470
AGNTAGE	-0.019	-1.667	-0.019	-1.667	-0.019	-1.730	-0.019	-1.694	-0.017	-1.555	-0.017	-1.582
AGNTFEM	0.224	0.943	0.248	1.043	0.231	0.971	0.225	0.946	0.229	0.967	0.253	1.066
AGNTBLK	1.802	1.552	1.758	1.531	1.787	1.556	1.828	1.574	1.717	1.486	1.643	1.426
NUMPEOP	0.070	0.660	0.054	0.510	0.062	0.581	0.066	0.630	0.059	0.552	0.065	0.610
MLS	-0.302	-1.231	-0.310	-1.271	-0.332	-1.355	-0.317	-1.297	-0.273	-1.122	-0.283	-1.158
AUDAGE	0.017	0.950	0.017	0.961	0.016	0.911	0.017	0.950	0.018	1.000	0.019	1.034
AUDFEM	-0.487	-2.061	-0.475	-2.008	-0.457	-1.934	-0.487	-2.068	-0.479	-2.039	-0.497	-2.099
AUDCHLD	0.087	0.284	0.054	0.179	0.038	0.124	0.052	0.170	0.072	0.237	0.053	0.174
PREVOWN	-0.115	-0.441	-0.115	-0.442	-0.112	-0.430	-0.122	-0.468	-0.146	-0.560	-0.157	-0.602
AFAMINC	0.004	0.931	0.004	1.130	0.004	1.170	0.004	1.011	0.004	1.066	0.004	1.119
INC/VAL	0.019	0.042	0.016	0.037	-0.011	-0.026	-0.002	-0.004	-0.012	-0.028	-0.034	-0.078
OWAW	1.069	2.460	0.886	1.523	1.096	2.136	0.961	2.086	0.570	1.454	0.088	0.232
OWAI	0.770	1.767	0.920	1.649	1.080	2.175	0.837	1.851	0.350	0.844	-0.210	-0.494
OIAI	1.042	2.452	0.861	1.539	0.903	1.820	0.943	2.082	0.679	1.853	0.464	1.399
OWNOAD	0.848	1.334	0.801	1.131	1.025	1.507	0.727	1.120	0.200	0.307	0.309	0.405
OINOAD	-0.131	-0.201	-0.509	-0.643	-0.317	-0.444	-0.114	-0.168	-0.150	-0.257	-0.483	-0.920
SIM	-0.334	-1.244	-0.313	-1.170	-0.308	-1.149	-0.314	-1.173	-0.323	-1.215	-0.304	-1.145
CONDO	0.198	0.602	0.183	0.561	0.188	0.575	0.153	0.469	0.137	0.419	0.129	0.395
CCITY	0.072	0.160	1.411	0.406	0.221	0.491	0.134	0.296	0.050	0.111	0.021	0.048

^aMinority Percent indicates the minimum minority composition for the agent's office to be considered in a minority neighborhood, holding the minimum advertised unit composition at 5 percent.

Endnotes

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1. HDS was sponsored by the U.S. Department of Housing and Urban Development and conducted by the Urban Institute and the Metropolitan Studies Program at Syracuse University. For more details, see Yinger (1995).
2. The categories “white” and “Hispanic” are not mutually exclusive; in this paper, “white” is our shorthand for non-Hispanic white. We also use “African American” and “black” as synonyms.
3. In addition, employment audits have been used to test hypotheses about the causes of employment discrimination (Kenney and Wissoker, 1994), and car sales audits have been used to test hypotheses about the causes of discrimination by car salesmen (Ayres and Siegelman, 1995).
4. Much of the recent research on mortgage discrimination explores racial and ethnic differences *i* loan approval using data that virtually all lenders in the country are required to submit to the federal government under the Home Mortgage Disclosure Act. See, for example, Avery, Beeson, and Sniderman (1996), Munnell et al. (1996), and Myers and Chan (1996). Several scholars also examine racial and ethnic differences in loan default rates. See Berkovec et al. (1994, forthcoming), Goering and Wienk (1996), and Ross (1997).
5. The Fair Housing Act also says it is discrimination to use business practices that have a disparate impact on a protected class and that cannot be justified as a business necessity. See Schwemm (1992). Audits are not designed to detect discrimination based on the disparate impact standard.
6. The vast majority of experts reject race as a meaningful biological concept. See the research reviewed in Shanklin (1994) or Yinger (1995). In this paper we use the term “white” to indicate people with European ancestry and light skins, another socially defined group.
7. The minority teammate was always assigned a slightly higher income. This procedure helped to avoid detection and to ensure that income differences did not result in less favorable treatment of minorities.

8. Rental audits also were conducted by HDS, but they are not examined in this paper. Basic results are in Yinger (1995).
9. Neither discrimination that occurs later in a housing market transaction, that is, during the granting of mortgages and the acceptance of bids in the sales market or during credit checks and the selection of tenants in the rental market, nor discrimination in parts of the housing market not served by agencies that advertise in major newspapers can be measured with the HDS data.
10. A third category involves the geographic location of housing units recommended or shown by the broker. A broker can further constrain a minority customer's access to housing by showing her housing only in largely black neighborhoods or in neighborhoods with lower house values than those made available to her white teammate. This type of behavior, which is called racial or ethnic steering, is discussed in detail in Turner, Edwards, and Mickelsons (1991), Turner and Mickelsons (1992), and Yinger (1995).
11. HDS-based estimates of discrimination in broker actions that are not qualitative are provided in Yinger (1995) and HDS-based estimates of discrimination in sets of broker actions are provided in Yinger (1991).
12. If P_{wa} is the probability that an action will be taken for the white auditor in audit a , then the impact of minority status on the probability of the action can be approximated by the average across audits of $dP_{wa}(1 - P_{wa})$. See Fomby, Hill, and Johnson (1984). Although P_{wa} cannot be estimated because a_a is not observed, one might be tempted to use the well-known shortcut of substituting the share of audits in which the action was taken for the white auditor, say P_w , for P_{wa} in the above formula. In our view, however, this shortcut requires unreasonably strong assumptions. Nevertheless, this method yields results similar to those of the second method described below (and presented in row 6 of Tables 3 and 4). The reader can verify this using estimates of d from Table 2 and estimates of P_w from the first row of Table 3 or 4.
13. A few other minor differences in teammate roles occasionally arise, but they affect so few audits and have so little impact on the results that we do not include them in our final regressions. Note that controlling for teammate differences in the race or ethnicity of the broker is a conservative procedure in the sense that purposeful matching of customer to broker could be part of an agency's system of discrimination. Because the minority teammate is always assigned a slightly higher income, it is not possible to estimate the impact of income differences on auditor treatment. This also may lead to an underestimate of discrimination against minorities, but the income differences are small and often not observed by the broker, so the degree of underestimation is undoubtedly very small.
14. As we will see, however, we can reject the hypothesis of no discrimination in queries about income against dark-skinned Hispanics.
15. The reader can use Figures 1 and 2, along with the inverse log of the estimates in Table 2, to calculate comparable results at any other value of P_w .

16. A comparison of black and Hispanic results must be interpreted with care. HDS was not designed to yield precise comparisons of this type. Moreover, our approach only indicates the black-Hispanic difference in the probability of encountering discrimination on a few types of broker behavior. It does not reveal which group encounters discrimination in more types of broker behavior, nor does it indicate whether the cost of discrimination is higher for one group than for the other. See Yinger (1995).
17. The degree of underestimation also may not be the same for blacks and Hispanics. In the case of whether the advertised unit was available, the simple measure indicates a higher probability of discrimination against blacks, whereas the odds-ratio measures indicate a higher probability of discrimination against Hispanics.
18. The literature on tipping, which builds on the work of Schelling (1971) is reviewed in Yinger (1995).
19. Another possible indicator is whether the advertised unit is in the central city.
20. In addition, discrimination might be higher in suburbs, where the most prejudiced whites are likely to live, than in central cities.
21. For some strong evidence that MLS's are used to steer blacks, see Yinger (1995). A referee pointed out to us that incentives to discriminate may change as new technologies, such as the Internet, become available to brokers and customers.
22. Yinger (1995) finds evidence that brokers are less likely to discriminate in showing advertised units than in showing similar, unadvertised units.
23. In addition, just over half the units in the black-white audits were in tracts less than 2.5 percent black. This result reflects the fact that units in largely black or integrated neighborhoods are rarely advertised in the newspaper. See Yinger (1995). In the data set used for this paper, the median minority composition for census tracts is 6.68 percent for the advertised housing unit and 6.37 percent for the broker's office.
24. The regressions do not all contain exactly the same list of explanatory variables because each one involves a different subsample, and some of the categories that define explanatory variables are empty in some subsamples.
25. Yinger (1995) also finds less discrimination against female auditors in some non-qualitative types of broker behavior.
26. When this composition is raised to 7.5 percent for the broker's office, for example, the coefficients of OWAW and OWAI both increase in magnitude and the latter becomes significant at the 5 percent level for a two-tailed test. In some other cases, however, changes in the boundary composition lower the t-statistics of these variables. Regression results for a variety of different boundary definitions are presented in Appendix C. Variables measuring the actual racial composition in the neighborhood of the advertised unit and of the broker's office are not significant in any regressions.

27. More formally, a move from OWAW to OWAI lowers the estimate of discrimination by 0.299 (which is 1.069 minus 0.770). This difference has a t-statistic of -0.884, which is not statistically significant.
28. Examinations of the number of houses shown by Page (1995) and Yinger (1995) also find high discrimination for houses in integrated areas. Note also that older brokers are less likely to discriminate than younger brokers, a result that supports the view, associated with the customer-prejudice hypothesis, that more established brokers are less likely to discriminate. This result is only significant at the two-tailed 10 percent level, however.
29. The coefficient of the family income variable is positive and almost significant at the 5 percent level with a two-tailed test (controlling for the income-to-value ratio). This result suggests that the higher the income required to purchase a house, the harder it is for brokers to believe that a black customer could possibly be qualified.
30. The opposite results appears in the unreported regression for inspections of the advertised unit, where Hispanics with heavy accents encounter more discrimination, a result that is significant at the 5 percent level based on a one-tailed test.
31. Coefficient estimates for SIM and CCITY are also significant in the regression for broker queries about housing needs, which is not reported, but their implications for the three hypotheses are not so clear for this type of broker behavior.
32. For a detailed discussion of fair housing policy, see Galster (1990a) or Yinger (1995).
33. Using a one-tailed test, dark-skinned auditors also encounter more discrimination at the 5 percent level in the invitations to call back.
34. For more on this topic, see Yinger (1995).
35. Brokers also discriminate more when they have more flexibility, as indicated by the presence of units similar to the advertised unit.

Table 1. Qualitative Choices by Real Estate Brokers

Housing Availability

Advertised Unit Available = Broker told the auditor that the advertised unit was available.

Advertised Unit Inspected = Broker showed the advertised unit to the auditor.

Similar Units Inspected = Broker showed the auditor units similar to the advertised unit available.

Credit Assistance

Financial Assistance Offered = Broker offered to help the auditor find financing.

Sales Effort

Invitation to Call Back = Broker invited the auditor to call back.

Follow Up Call = Broker made a follow-up call to the auditor.

Asked About Income = Broker asked about the auditor's income.

Asked About Housing Needs = Broker asked about the auditor's housing needs.

Table 2. Estimates of the Extent of Discrimination

Broker Action	Black Audits			Hispanic Audits		
	Estimate of Discrimination^a	t-Statistic	Number of Observations	Estimate of Discrimination^a	t-Statistic	Number of Observations
Call Back	0.186	1.413	523	0.479	3.496	527
Ask About Income ^b	-0.890	-4.987	353	0.005	0.031	365
Follow-Up Call Made	0.655	3.017	303	1.338	4.762	262
Ask About Needs	0.318	1.991	382	0.346	1.989	343
Financial Assistance Offered	0.706	4.278	403	0.306	1.949	414
Advertised Unit Inspected	0.607	1.992	205	0.784	2.761	213
Similar Unit Inspected	0.690	3.331	334	0.774	2.804	292
Advertised Unit Available	0.860	2.971	173	1.483	2.483	175

^aEstimate of ω in Equation (5).

^bThe sign change for Ask About Income is caused by the disadvantageous action being assigned 1 rather than 0 for the white customer.

Table 3. Approximations of the Probability of Discrimination, Black Audits

Broker Action	Probability of Action for		Difference in Probability of Action	Odds Ratio	Probability Measure of Discrimination		Maximum Possible Discrimination, Absolute Gap Measure ^d
	White ^a	Black			Fixed Percentage Gap ^b	Fixed Absolute Gap ^c	
Call Back	0.475	0.437	0.038	1.204	0.097	0.046	0.046
Ask About Income	0.222	0.303	-0.081	0.411	0.847	0.188	0.219
Follow-Up Call Made	0.267	0.174	0.093	1.926	0.404	0.108	0.162
Ask About Needs	0.751	0.686	0.065	1.374	0.085	0.064	0.079
Financial Assistance Offered	0.376	0.263	0.113	2.025	0.390	0.147	0.175
Advertised Unit Inspected	0.630	0.573	0.057	1.834	0.236	0.149	0.151
Similar Unit Inspected	0.350	0.259	0.091	1.994	0.392	0.137	0.171
Advertised Unit Available	0.886	0.810	0.076	2.363	0.154	0.134	0.212

^aShare of audits in which the white customer received treatment.

^bEstimated fixed proportion by which probability of action for black customers falls short of probability of action for whites.

^cEstimated fixed amount by which probability of action for black customers falls short of probability of action for whites.

^dMaximum absolute gap between the probability of action for white and black customers, given the estimated odds ratio.

Table 4. Approximations of the Probability of Discrimination, Hispanic Audits

Broker Action	Probability of Action for		Difference in Probability of Action	Odds Ratio	Probability Measure of Discrimination		Maximum Possible Discrimination, Absolute Gap Measure ^d
	White ^a	Hispanic			Fixed Percentage Gap ^b	Fixed Absolute Gap ^c	
Call Back	0.490	0.372	0.118	1.614	0.239	0.117	0.119
Ask About Income	0.294	0.309	0.015	1.005	0.003	0.001	0.001
Follow-Up Call Made	0.248	0.191	0.057	3.811	0.579	0.168	0.323
Ask About Needs	0.767	0.758	0.009	1.413	0.088	0.067	0.086
Financial Assistance Offered	0.377	0.333	0.044	1.358	0.182	0.069	0.076
Advertised Unit Inspected	0.667	0.613	0.054	2.190	0.284	0.189	0.193
Similar Unit Inspected	0.355	0.292	0.063	2.168	0.430	0.153	0.191
Advertised Unit Available	0.887	0.849	0.038	4.406	0.278	0.246	0.355

^aShare of audits in which the white customer received treatment.

^bEstimated fixed proportion by which probability of action for Hispanic customers falls short of probability of action for whites.

^cEstimated fixed amount by which probability of action for Hispanic customers falls short of probability of action for whites.

^dMaximum absolute gap between the probability of action for white and Hispanic customers, given the estimated odds ratio.

Table 5. Variables to Test Hypothesis About Discrimination

Broker and Agency Characteristics

BROAGE	= The broker's age.
BROFEM	= Whether the broker was female.
BROBLK	= Whether the broker was black (black audits only).
BROHIS	= Whether the broker was Hispanic (Hispanic audits only).
NUMPEOP	= The maximum number of people encountered by either auditor at the agency.
MLS	= Whether the broker serving either auditor used an MLS directory.

Auditor Characteristics^a

AUDAGE	= The auditor's age.
AUDDARK	= Whether the minority auditor had dark skin (Hispanic audits only).
AUDACNT	= Whether the minority auditor had a heavy accent (Hispanic audits only).
AUDDAAC	= Whether the minority auditor had dark skin and a heavy accent (Hispanic audits only).

Auditors' Assigned Role

AUDCHLD	= Whether the auditor's role was that of a parent.
PREVOWN	= Whether assigned role was that of a current homeowner.
AFAMINC	= The assigned family income for the audit.
INC/VAL	= The assigned family income divided by the listing price of the advertised unit.

Neighborhood and Other Audit Characteristics^b

OWAW	= Broker's office and advertised unit in white census tract.
OWAI	= Broker's office in white tract, advertised unit in integrated tract (omitted category).
OIAW	= Broker's office in integrated tract, advertised unit in white tract.
OIAI	= Broker's office and advertised unit in integrated tract.
OWNOAD	= Broker's office in white tract, no advertised units available.
OINOAD	= Broker's office in integrated tract, no advertised units available.
SIM	= Whether any units similar to the advertised unit were available to either auditor.
CONDO	= Whether the advertised unit was a condominium.
CCITY	= Whether the advertised unit was located in a central city.

Site Variables^c

Dummy variable for each audit site, with New York as the omitted site.

Timing Variables

Dummy variable for the month (May through August with July as the omitted month).

^aThe omitted category of Hispanics was light skin with no accent.

^bA white census tract is defined as one with no more than 5 percent minority (black plus Hispanic) residents and an integrated tract is one with more than 5 percent minority residents.

^cBlack-white and Hispanic-Anglo audits were conducted in New York*, Chicago*, Los Angeles*, Austin, Bergen County, Denver, Houston, and Miami. Black-white audits also were conducted in Atlanta*, Birmingham, Cincinnati, Dayton, Detroit, Lansing, Macon County, New Orleans, Orlando, Philadelphia, Pittsburgh, and Washington, DC. Additional Hispanic-Anglo audits were conducted in San Antonio*, Phoenix, Pueblo, San Diego, and Tucson. An asterisk indicates an in-depth site, where relatively many audits were conducted.

Table 6. Regression Results for Black Audits^a

	Call Back		Ask About Income		Advertised Unit Inspected	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
INTERCEPT	0.186	1.409	-0.890	-4.972	0.607	1.990
BROAGE	-0.019	-1.727	0.040	2.500	0.002	0.091
BROFEM	0.224	0.941	-0.551	-1.680	0.030	0.066
BROBLK	1.802	1.552	1.441	1.310	2.599	1.563
NUMPEOP	0.070	0.660	0.228	1.629	-0.499	-2.248
MLS	-0.302	-1.233	-0.526	-1.556	-0.157	-0.331
AUDAGE	0.017	0.944	0.013	0.520	-0.088	-2.588
AUDFEM	-0.487	-2.064	-0.285	-0.925	0.419	0.940
AUDCHLD	0.087	0.284	-0.089	-0.241	-0.574	-0.879
PREVOWN	-0.115	-0.441	-0.157	-0.430	-0.419	-0.840
AFAMINC	0.004	1.000	0.010	2.000	-0.001	-0.125
INC/VAL	0.019	0.043	-1.219	-1.152	-0.268	-0.579
OWAW	1.069	2.457	-0.818	-1.288	1.184	1.310
OWAI	0.770	1.766	-0.597	-0.963	-0.015	-0.016
OIAI	1.042	2.452	0.045	0.073	0.320	0.369
OWNOAD	0.848	1.333	-0.242	-0.286	-	-
OINOAD	-0.131	-0.200	0.668	0.854	-	-
SIM	-0.334	-1.242	-0.457	-1.175	-0.421	-0.816
CONDO	0.198	0.600	0.030	0.071	-1.635	-1.642
CCITY	0.072	0.159	-0.425	-0.701	0.723	0.811

^aThese regressions also include dummy variables for sites and months (see Table 4) and controls for teammate differences (in auditor age; in broker age, sex and race; and in the order in which the teammates contacted the agency).

Table 7. Regression Results for Hispanic Audits^a

	Financial Assistance Offered		Advertised Unit Available	
	Coefficient	t-Statistics	Coefficient	t-Statistics
INTERCEPT	0.306	1.949	1.483	2.443
BROAGE	-0.042	-2.800	-0.013	-0.464
BROFEM	-0.161	-0.583	-0.695	-1.374
BROHIS	-1.042	-1.569	-0.705	-0.709
NUMPEOP	-0.074	-0.747	-0.420	-1.909
MLS	-0.330	-1.196	0.493	1.012
AUDAGE	0.033	1.737	0.027	0.587
AUDFEM	-0.171	-0.629	-0.270	-0.506
AUDCHLD	-0.227	-0.728	0.143	0.250
AUDDARK	0.462	0.989	-0.060	-0.062
AUDHEAVY	-0.718	-1.967	0.848	1.201
AUDBOTH	-0.527	-0.918	-0.142	-0.129
PREVOWN	0.109	0.352	0.002	0.004
AFAMINC	-0.007	-1.400	-0.005	-0.625
INC/VAL	0.026	0.099	-0.091	-0.082
OWAW	-0.465	-0.571	1.807	1.702
OWAI	-0.510	-0.678	1.801	1.951
OIAI	-0.582	-0.816	3.840	4.885
OWNOAD	0.917	0.872	---	---
OINOAD	0.966	1.141	---	---
SIM	0.754	2.251	-1.178	-2.650
CONDO	0.033	0.082	-1.177	-1.513
CCITY	1.048	2.531	-2.168	-2.641

^aThese regressions also include dummy variables for sites and months (see Table 4) and controls for teammate differences (in auditor age; in broker age, sex and race; and in the order in which the teammates contacted the agency).

Figure 1: The Odds Ratio with a Fixed Percentage Gap

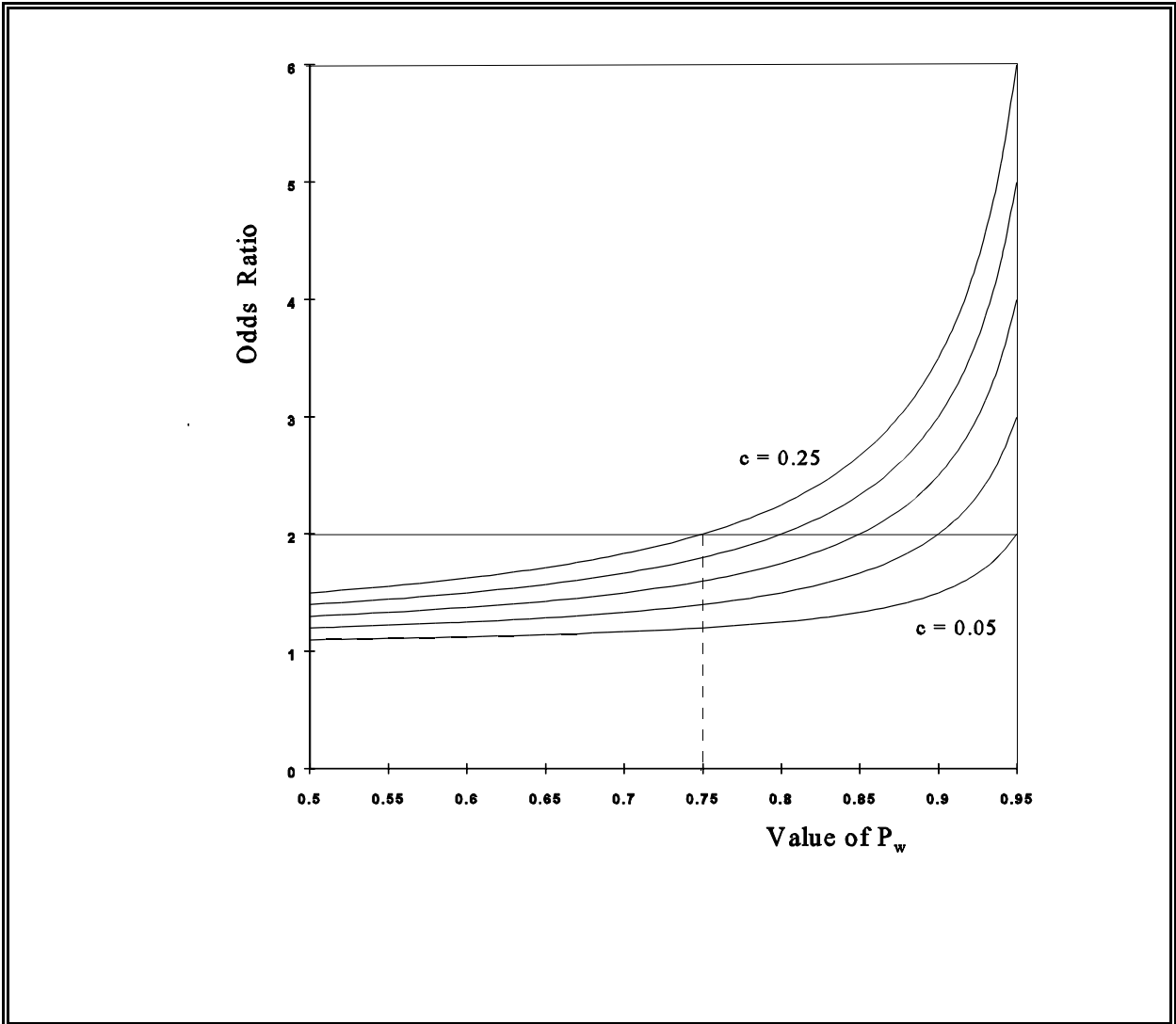
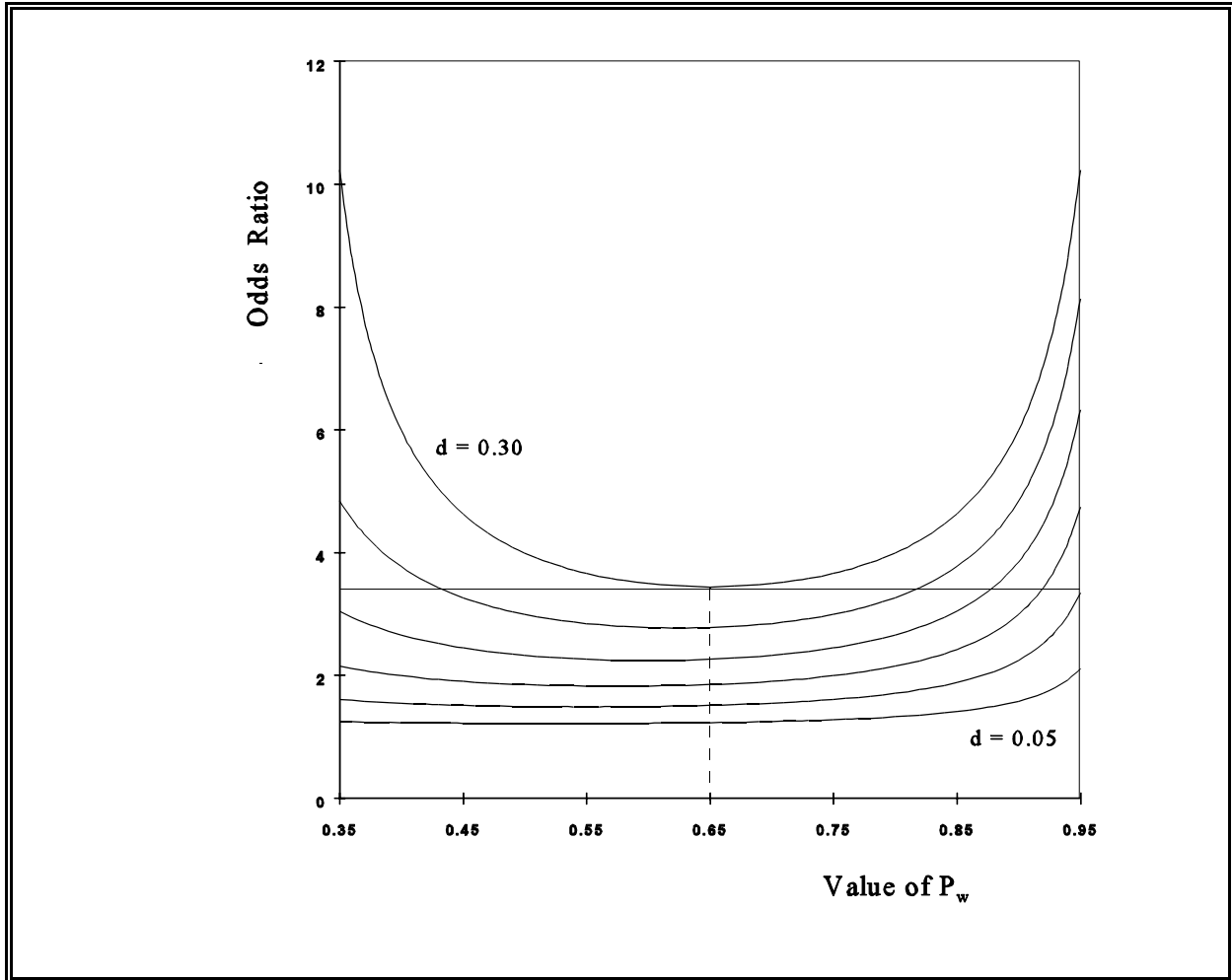


Figure 2: The Odds Ratio with a Fixed Absolute Gap



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