Housing Discrimination and its impact on Economic growth

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Abstract

This paper examines the impact of neighborhood factors on discrimination in housing sales markets by real estate brokers using fair housing audit data from the 2000 Housing Discrimination Study for three minority groups (African Americans, Hispanics and Asians). It uses a bivariate probit model and a fixed-effects logit model to study the causes of spatial variation of the nature of discrimination. The study finds that discrimination is caused by white customer prejudice. It fails to find a general evidence of discrimination due to broker prejudice and it does not have enough information to test for statistical discrimination. Specifically, it finds evidence that Hispanics and Asians are more likely to encounter discrimination in neighborhoods with higher share of owner-occupied housing. It also finds that Asians are less likely to face discrimination in Asian-dominated neighborhoods but does not find evidence of a general decline in discrimination based on the agent advertising a unit in an Asian-dominated neighborhood. Overall, the study finds that neighborhood unobservables are playing a major role in revealing limited information about the effect of neighborhood on the discriminatory behavior of brokers toward minorities. This has consequences over the minorities' overall growth and development as a race and the country's GDP.

1. Introduction

In this paper we focus on the issue of discrimination against minority homebuyers that may lead to the segregation of neighborhoods (for example, Farley and Frey (1994); Iceland, Weinber and Steinmetz (2002)). Racial and ethnic discrimination in housing is defined as systematically unfavorable treatment in the housing markets based solely on race or ethnicity. Several theories of discrimination predict that discriminatory behavior of brokers will limit minority opportunities for owning a house in a predominantly white neighborhood. Earlier studies tested different hypotheses regarding differential treatment of white customers and minority customers, like the broker-prejudice hypothesis, the white-customer-prejudice hypothesis and statistical discrimination (See Galster (1990), OndrichStricker and Yinger (1998, 1999), Zhao, Ondrich and Yinger (2006), Yinger (1986, 1991, 1995), etc). We use audit data fromthe 2000 Housing Discrimination Study (HDS 2000) on three large minority groups (African-Americans, Hispanics and Asians) in Los Angeles to examine the causes of spatial variation of the nature of discrimination.

In this paper, we explore the motivations that influence the way a real estate broker treats his or her customers who belong to different racial and ethnic groups in Los-Angeles, which is a multi-ethnic and racially-diverse city. The reason to focus on one metropolitan area is to study the impact of geographic factors on the decision by brokers on how to treat minority homebuyers who belong to different groups. Yinger (1986) showed that discrimination varies among different neighborhoods in Boston. Therefore, in a multi-ethnic and racially-diverse city like Los-Angeles, the complex interactions of multiple minority groups with whites become extremely important.

A real estate agent is less likely to threaten his reputation and hurt his current and future business by antagonizing the minority group dominating the neighborhood from which he derives his business. So we ask two questions: Are real estate agents more likely to discriminate in places where they perceive a lower payoff from showing houses to a particular minority group? And does discrimination vary with space? In order to seek an answer to these questions, we examine how a real estate agent treats his customers who belong to different racial or ethnic groups in neighborhoods dominated by one group. For example, we ask specific questions like: Are Hispanics treated differently in a Hispanic-dominated neighborhood than in a predominantly white neighborhood? This is the first paper that looks at the problem of discriminatory treatment of minorities belonging to three racial and ethnic groups compared to whites in one metropolitan city.

Previous literature in this area has identified some broader sets of theories about the causes of discrimination. The white -customer-prejudice hypothesis, which is based on Becker (1971), states that brokers discriminate in order to protect their actual or future business with prejudiced whites in the local community. This incentive may be particularly strong in neighborhoods that are at risk of tipping, that is, of rapid racial transition. As it is not possible to test this prejudice directly since the share of prejudiced whites cannot be observed, we can devise indirect tests of this hypothesis. A largely Black, Hispanic or Asian neighborhood is more likely to be closer to the tipping point than white neighborhoods. So this hypothesis predicts that brokers are less likely to discriminate in places having a larger white population than for example, places with a large black population.

Ondrich, Stricker and Yinger (1999) propose that white-renter neighborhoods are less threatened by the entry of minorities than neighborhoods having a large share of prejudiced

white homeowners. Therefore, the customer-prejudice hypothesis predicts that discrimination increases with the share of owner occupied housing units in the neighborhood.

The broker-prejudice hypothesis (also based on the idea by Gary Becker (1971)) says that brokers discriminate against minorities simply because they are not fond of them. As Ondrich, Ross and Yinger (2003) point out, evidence of this hypothesis is revealed by looking at the houses an agent accepts as listings. That is, an agent who advertises houses in an integrated or minority-dominated neighborhood will be less likely to discriminate than an agent who does not. We use the census tract characteristics in which the advertised unit is located as neighborhood controls in our analysis. The broker-prejudice hypothesis therefore implies that discrimination is less likely as the percentage of a minority group increases in a neighborhood. But to have conclusive evidence of the broker-prejudice hypothesis we need to observe broker behavior carefully. A broker might discriminate less when the advertised unit is in a minority neighborhood because they are less prejudiced than others and discriminate less, or they may simply be less likely to discriminate concerning the advertised unit when it is in a minority-dominated neighborhood because they would not offend their white customers since those customers are not in minority neighborhoods (white-customer-prejudice hypothesis). Therefore, the broker- prejudice hypothesis predicts that discrimination is less likely to occur for all units (not only advertised units rather other units shown to the auditors) when the percentage of a minority group is high in a neighborhood.

The third hypothesis, which is known as statistical discrimination, is based on the idea by Phelps (1972) and is said to exist if brokers treat people of different races and ethnicities differently because group membership provides information on unobservables and therefore agents increase profits by considering group membership. Thus a broker is more likely to

recommend houses situated in an integrated neighborhood to a minority customer because the broker believes that increases the likelihood of a sale.

In this paper, we use fair housing audit data from HDS 2000. A fair housing audit is a research technique where treatment is compared between two home seekers who belong to two groups. An audit is designed in such a way that two teammates, one white and the other one belonging to a minority group, visit the same housing agency within a short interval to inquire about available housing. These teammates are matched by gender, age, and are also assigned similar socioeconomic characteristics like income, marital and parental status to appear equally qualified for housing. They are also given training to exhibit similar behavior during an audit.

After the completion of a visit, teammates independently record how they were treated and what they were told. Discrimination is said to exist when a person receives unfavorable treatment based solely on his membership to a particular group. Because the two teammates are made to appear equally qualified for housing, any unfavorable treatment of minority auditors in a sample of audits provides a powerful test for discrimination. In audit data we have information of the location of the advertised house that the auditors request to see during a visit. If the teammates are treated differently in a white neighborhood than in a minority-dominated neighborhood then we can test the hypotheses behind the neighborhood effect of discrimination on homebuyers.

Note that the third hypothesis, statistical discrimination, is said to exist when a real estate agent believes that it is profitable to treat people belonging to different groups differently. Real estate agents may assume that all households like to live with members of their own group, and accordingly a housing transaction is most likely to be completed when, for instance, a Hispanic customer is matched with a predominantly-Hispanic neighborhood. Statistical discrimination

predicts that Hispanic customers are most likely to encounter discrimination when the advertised unit is in a Black, White or Asian neighborhood.

We show in this paper that when we use a sample of audits from one metropolitan area, the findings are limited due to the dominating effect of unobserved neighborhood factors. We fail to find support of the broker-prejudice hypothesis. Though we find Asians are less likely to encounter discrimination in Asian-dominated neighborhoodsbut we find no evidence of a general decline in discrimination based on the agent advertising a unit in an Asian-dominated neighborhood. We find support for the white-customer-prejudice hypothesis, that is, Hispanics and Asians are more likely to encounter discrimination in neighborhoods with higher shares of owner-occupied housing. Therefore, we identify white customers' prejudice as the cause of discrimination in Los Angeles.

The paper proceeds as follows. Section 2 provides a literature review of previous audit studies. Section 3 describes the methodology adopted in this paper, namely the bivariate probit model and the fixed-effects logit model. Section 4 gives a description of the sample created out of HDS 2000 data that is used in this study. Section 5 discusses the estimation results and tests hypotheses behind causes of discrimination. The final section summarizes the key results and concludes the paper.

2. Earlier studies of housing discrimination

For fifty years, scholars have been conducting fair housing audits. Yinger (1995) reviews earlier audit studies. Zhao, Ondrich and Yinger (2006) mention that large scale housing audit studies were conducted in United States in 1977 (Wienk, Reid, Simonson and Eggers, 1979) and Great Britain in 1967(McIntosh and Smith, 1974). The audit technique has also been applied to

the mortgage market, the labor market, as well as the automobile sales market by using data from different countries. Recent contributions to this literature include Turner, Godfrey, Ross and Smith (2003) and Bertrand and Mullianathan (2004).

The U.S. Department of Housing and Urban Development conducted a national audit study, the Housing Discrimination Study in 1989 (HDS 1989), and found evidence of housing discrimination nationwide in housing sales. Several recent studies of housing discrimination by real estate agents are based on HDS 1989. Ondrich, Ross and Yinger (2001) examine the geography of housing discrimination in four large urban areas using HDS 1989. Their paper attempts to understand the nature of discrimination faced by blacks in different metropolitan areas. Though most audit studies consider audit as the unit of observation, Ondrich, Ross and Yinger (2001) consider an approach in which an observation is defined by a housing unit. In doing so, they can conduct an in-depth analysis of the spatial nature of discrimination in metropolitan areas. They find evidence of steering of black customers toward heavily Black neighborhoods in Atlanta and Chicago. By using this housing unit-based approach, they could overcome the small sample size problem due to limited number of audits in each area, roughly 100 for each group. In this paper we generate an audit sample size large enough to conduct an analysis in a city by including three minority groups together.

Most of the other audit studies use national samples to examine the causes of discrimination in the real estate market (for example, Page (1995), Roychoudhury and Goodman (1992, 1996), Yinger, (1986, 1991, 1995), Zhao (2005), Zhao, Ondrich, Yinger (2006), Ondrich, Ross and Yinger (2000)). This paper builds upon the methods used in previous studies in the context of analyzing the effect of detailed geography on discrimination in a particular metropolitan area. Specifically, this paper uses a fixed-effects logit model and a simple bivariate

probit model to characterize broker behavior using a sample of audits and examine the influence of neighborhoods on discrimination. Using the fixed-effects logit model on a national sample of white-Black and white-Hispanic audits from HDS 2000, Zhao, Ondrich and Yinger (2006) explore minority white differences in discrete choices by real estate agents. They find that blacks are less likely to encounter discrimination when advertised units are in Hispanic neighborhoods, but they did not find any evidence of discrimination faced by blacks in Black neighborhoods.

Similarly, Ondrich, Ross and Yinger (2000) analyze the incidence of discrimination using a random effect bivariate probit model specification based upon data from HDS 1989. They find that when the advertised unit is in an integrated neighborhood, blacks are more likely to encounter discrimination.

Housing discrimination has also been studied through non-audit techniques. These studies provide indirect evidence of housing discrimination from housing prices. As Ross (2008) points out, if a substantial fraction of Blacks are forced or even persuaded to limit their search for residential homes to specific neighborhoods, then these limited sets of neighborhoods are going to experience an excess demand for housing by Blacks. This increase in demand will drive up the price that Blacks paid for houses and will result in predominantly African-American neighborhoods. A large number of studies have examined whether Blacks pay a price premium for housing in comparison to whites in U.S. cities and metropolitan areas. See, for example, King and Mieszkowski (1973), Yinger(1978), Schnare (1976), Follain and Malpezzie (1981). A more recent study by Cutler, Glaeser and Vigdor (1999) confirms that African-Americans paid a rent premium in the first half of this century but it fell substantially between 1950 and 1970 and reversed entirely by 1990.

With different cities experiencing different levels of migration by minorities and neighborhoods expanding over time, it has become increasingly difficult to capture the extent of housing discrimination through studying housing price premia. In fact, Kiel and Zabel (1996) controlled for neighborhood quality and housing submarkets by exploiting detailed spatial information in a confidential version of the American Housing Survey to find that Blacks paid a significant premium in only one of the metropolitan areas examined in their study. If we fail to capture the housing price premium paid by blacks, then non-audit studies cannot gather evidence of discrimination against blacks in housing markets. The advantage of the experimental approach of audit studies over housing premium studies is that audit studies directly measure the treatment of homebuyers of different racial backgrounds in different neighborhoods. If neighborhoods matter, it is difficult to capture the true effect of race on house prices and the level of housing discrimination will be understated. But we do not face this problem with audit studies and we can measure whether discrimination varies with neighborhoods, which is the main focus of this paper.

3. Methodology

This study uses two models to analyze the nature of discrimination. Audit teammates share some unobserved factors because they are assigned same socioeconomic characteristics, undergo the same training and visit the same agency to inquire about the same advertised house within a small interval of time. Therefore, the outcomes of the two visits are not independent, even after controlling for the observed characteristics. In this paper, we adopt a bivariate probit model as well as a fixed-effects logit model as the econometric framework. Ondrich, Stricker and Yinger (1998) show that the fixed-effects logit model can be used to correct potential biases from unobserved factors shared by teammates. Zhao, Ondrich and Yinger (2006) use the fixed-

effects logit model developed by Ondrich, Stricker and Yinger (1998) to examine the causes of discrimination by real estate brokers based on data from HDS 2000. Ondrich, Ross and Yinger (2000) use a random effect bivariate probit model to study broker behavior within an audit to account for systematic differences in treatment based solely on minority status. Similarly, we employ a simple bivariate probit model that also acknowledges the interdependence of the visits by the teammates and compare these results to that of the fixed-effects logit model.

We start by employing the latent variable specification for an audit *t*,

$$Y_{it}^{*} = \delta_i + \beta_i X_{it} + \varepsilon_{it}, Y_{it} = \begin{cases} 1 & Y_{it}^{*} \geq 0 \\ 0 & Y_{it}^{*} < 0 \end{cases} \quad \text{and} \quad i = w, m \qquad (1)$$

where Y_{it}^{*} is the latent variable associated with the propensity of auditor i to receive favorable treatment in audit *t*. X_{it} is a column vector of observed auditor, broker and neighborhood characteristics, and visit circumstances that determine treatment, β_i is the vector of coefficients associated with X_{it}.δ_i is the intercept of the equation of auditor *i*. The error term ε_{it}captures the influence of unobserved visit circumstances on the treatment of the homebuyer. We assume that this error term is distributed normally in the bivariate probit specification. But in the fixed-effects logit specification, we separate this error term into a fixed effect component α_t, and a component μ_{it} that is assumed to follow the extreme value distribution. The major difference in our two estimation procedures is that in the fixed-effects logit model we are able to "difference away" the fixed effect but the fixed effect remains in the bivariate probit model creating the correlation between the equations. As the auditors in an audit inquire about the same advertised unit, the correlation between the equations will be mostly driven by the fixed effect component.

For the bivariate probit specification, a broker's decision regarding the treatment of a home seeker can be represented by:

$$\Pr(Y_{wt}, Y_{mt} | \delta_w, \delta_m, X_{wt}, \beta_w, X_{mt}, \beta_m, \rho) = f(\delta_w + \beta_w X_{wt}, \delta_m + \beta_m X_{mt}, \rho) \quad (2)$$

where Y_{wt}, Y_{mt} are two indicator variables reflecting whether the auditor ***i*** (i= w,m; w= white, m=minority) receives favorable treatment in audit ***t*** and f is assumed to be normally distributed. ρ is the correlation coefficient between the two outcomes due to unobserved effects. The above model can be estimated using a bivariate probit-under the assumption that all errors follow a normal distribution.

For the fixed-effects logit specification, we write the broker's decision about the treatment of a potential white and minority homebuyer in this form:

$$\Pr(Y_{wt} = 1 | X_{wt}, \delta_w, \beta_w, \alpha_t) = f(\delta_w + \beta_w X_{wt} + \alpha_t)$$

$$\Pr(Y_{mt} = 1 | X_{mt}, \delta_m, \beta_m, \alpha_t) = f(\delta_m + \beta_m X_{mt} + \alpha_t) \quad (3)$$

where $Y_{it} = 1$ is for favorable treatment of auditor i (i=w,m;w= white, m=minority) in audit t. $\delta_w$is the intercept for the equation for the white auditor and δ_m is the intercept that identifies the equation for the minority auditor. Similar to the bivariate probit specification above, β_i is the vector of coefficients associated with the vector of explanatory variables X_{it} that include observed actual and assigned auditor, broker and neighborhood characteristics that determine treatment.α_t is the audit-specific fixed effect. Here, f is assumed to be a logistic distribution function.

In a fixed-effects logit model, we follow Zhao, Ondrich and Yinger (2006) and remove the audit-specific fixed effect from the probability function, conditional on the sum of Y_{wt} and Y_{mt}. For convenience, we define

$\delta_d = \delta_w - \delta_m$ and $\beta_d = \beta_w - \beta_m$

The conditional probability function can then be expressed as

$$\Pr(Y_{wt} - Y_{mt} = 1 | Y_{wt} + Y_{mt} = 1, X_{wt}, X_{mt}) = f(\delta_w - \delta_m + \beta_w X_{wt} - \beta_m X_{mt})$$

$$= f(\delta_w - \delta_m + \beta_w (X_{wt} - X_{mt}) + (\beta_w - \beta_m) X_{mt})$$

$$= f(\delta_d + \beta_w (X_{wt} - X_{mt}) + \beta_d X_{mt}) \quad (4)$$

With the above decomposition of the term $(\beta_w X_{wt} - \beta_m X_{mt})$ we can capture both the treatment on the whites and the racial differences in treatment towards the minority auditors. The first term $\beta_w (X_{wt} - X_{mt})$ gives the effect of observable teammate attribute differences on the treatment of whites and the second term $\beta_d X_{mt}$ captures the racial differences in the effect. Since we are using audit data where teammates are matched by the same observed auditor and socioeconomic characteristics to equally qualify for the advertised house in an audit, the term $\beta_w (X_{wt} - X_{mt})$ is zero when these characteristics do not vary across teammates. Moreover, conditioning on the sum of outcomes keeps only those audits where teammates were treated differently in the final sub-sample of the regression reducing the sample size. Chamberlain (1980) proves, however, that this approach, subject to mild restrictions on the fixed effect, yield consistent estimates of both the parameters and standard errors for the entire sample. Thus, the term $\beta_d X_{mt}$captures the impact of neighborhood variables or the gender of the auditor on treatment, which have identical values for teammates, and it is therefore a measure of racial or ethnic discrimination.

We estimate the above two specifications separately and compare their results. We can directly measure discriminatory treatment of minority homebuyers in the fixed-effects logit model from the elements of β_d. In order to compare the results of our fixed effects logit model to the results of the bivariate probit specification, we need to take the difference of β_w and β_m in (2) and compare it to β_d in (4). This results because in bivariate probit model specification β_w

and β_m capture the relationship between the explanatory variables and the latent treatment variable for white and minority auditors respectively. Therefore, we need to take the difference of these coefficients to capture the impact of minority status on treatment.

4. Data Description

In HDS 1989, audits were conducted on only two minority groups: African-Americans and Hispanics. However, since 1989 the racial and ethnic makeup of the metropolitan areas in the U.S. has undergone considerable transformation and Asians have also become one of the major racial groups. Accordingly, the national housing audit study of HDS 2000 was extended to include additional minority groups, including Asians. The HDS data for Los Angeles contain 329 sales audits-94 for black-white pairs, 93 for Hispanic-white pairs and 142 for Asian-white pairs[1].

The dependent variables in the first model are white and minority treatment on four binary variables. Table 1 shows the list of dependent variables and their descriptions. All four dependent variables are related to housing availability and reflect treatments in which minorities' access to housing is blocked due to direct discrimination. The first two dependent variables in our analysis are whether the advertised house is actually inspected and whether a house similar to the advertised house is inspected. If a broker shows a house to an auditor then it is considered to be a favorable treatment of an auditor. The other two dependent variables are whether the advertised unit is available and whether similar units are available. Since the teammates inquire separately about the advertised unit within a smaller time frame, so if the broker mentions to the white teammate that the unit is available but gives a negative response to the minority teammate

[1] Though audits were conducted for Chinese and Koreans separately in HDS 2000 we consider them as one group because of the small sample size of this study. The numbers are 70 and 72 respectively for Chinese and Koreans.

then it is considered as unfavorable treatment to the minority auditor. The means and standard deviations of these treatment variables are presented in Table 2.

The explanatory variables include auditor, agent and agency characteristics are irrelevant to testing the hypotheses regarding the influence of neighborhood on discrimination. These are included to control for observed audit circumstances in the model specifications. Table 3 presents this set of explanatory variables with descriptions. The explanatory variables in this model can be classified into four groups: auditor characteristics, broker characteristics, auditor's actual characteristics and neighborhood characteristics. The observed auditor and broker characteristics are sex, race, and age. Actual characteristics include the auditor's actual socioeconomic status, like income and whether the auditor was a homeowner himself. Also, whether the auditor had a discernible accent and the darkness of the auditor's skintone are included in this category. The racial composition of the neighborhood where the advertised unit is located and the percentage of owner- occupied housing units in the advertised unit's census tract constitute the neighborhood characteristics. Note that due to the comparatively thin sample size, we do not include a large set of explanatory variables in order to improve the power of the test. Previous studies like Zhao, Ondrich and Yinger (2006) and Ondrich, Ross and Yinger (2000) perform the analysis with a large set of covariates, but those are national studies having more than 1000 audits. In comparison there are only 329 audits in the sample. The sample means and standard deviations are given in Table 4.

For the fixed-effects logit model, the auditor and broker characteristics are included in the regression as the teammate differences of these attributes. These observed teammate differences controls insulate the estimates of discrimination from bias due to differences in observable teammate characteristics. This specification also includes interactions of neighborhood

characteristics with respect to whether the audit is a white-Black, white-Hispanic or white-Asian type. These interaction terms help test hypotheses relating to the causes of the neighborhood effects of discrimination.

5. Empirical Specifications and Estimation Results

Both the bivariate probit and fixed-effects logit model specifications for all four treatment variables control for the explanatory variables in Table 3 except for all of the neighborhood characteristics. As we use a pooled sample of audits for three minority groups in our analysis, we separate the racial neighborhood characteristics for these groups. We are interested to know whether blacks, for example, are treated differently in a neighborhood when the number of black residents increases in the neighborhood. So we interact the percentage of blacks in the census tract in which the advertised unit is located with Black-white audits in the sample to capture this effect. Similar interactions are included for Hispanics and Asians as well in the sample for white-Hispanics and white-Asian audits.

The empirical results for the bivariate probit model specifications are presented in Tables 5-8 and the results for the fixed-effects logit model specifications are presented in Tables 9-12. We run two separate regressions for each dependent variable in the bivariate probit and the fixed-effects logit specification. Since we are comparing treatment of whites to the treatment of minorities by real estate brokers, we analyze the nature of the treatment in a white-dominated neighborhood and in a minority-dominated neighborhood. We are worried that having the white-dominated neighborhood characteristics in addition to the minority-dominated neighborhood characteristics is going to exacerbate small sample bias due to the high correlation among them. As a result, we run two separate regressions for each dependent variable: Specification 1 includes the racial composition of the neighborhood of the advertised unit interacted with the

particular minority group considered in each audit as well as the share of owner occupied housing units in the census tract where the advertised unit is located as neighborhood controls. Specification II includes the percentage of whites in the neighborhood in which the advertised unit is located and the share of owner-occupied housing unit in the advertised housing unit's census tract. Tables 5-6 contain the results for Specification 1 and Tables 7-8 contains the results for Specification II estimated using the bivariate probit model specifications shown in Eq 2. Similarly, Tables 9-10 present the estimated coefficients for Specification 1 and Tables 11-12 present the coefficients for Specification II under the fixed-effects logit model explained in Eq 4.

There are three columns for each dependent variable in the bivariate probit specification as shown in Tables 5-8. The coefficients and standard errors for the white visits are reported in the first column and are entitled white effects. The results for the minority visit are presented in the second column that is labeled minority effects. As shown in Eq 2, the coefficients for the white and the minority visits are captured separately under the bivariate probit specification and the difference of these coefficients captures the racial differences in the treatment of the auditors (not shown in the table). If the difference is negative and significant, then it implies that an increase in the variable increases the likelihood that the minority auditor receives favorable treatment. The third column presents the significance tests for the difference in the coefficients.

In the fixed-effects specification, there are two columns for each dependent variable (Tables9-12). The first column reports the coefficients for the white treatment and the second column reports the racial difference of the white and minority treatment. Similar to the racial-difference coefficient in bivariate probit specification, a negative coefficient on the race coefficient implies that an increase in the variable decreases the likelihood that the minority faced discrimination.

For the variable "Advertised unit Inspected" under Specification I and Specification II, many racial effects for non-neighborhood variables are statistically significant at the 5 percent level. We discuss them here briefly since this topic is not the focus of our paper. For example, real estate agents are more likely to discriminate against younger minority customers. Also, minority females are more likely than minority males to encounter discrimination in "Advertised unit inspected." We also find that older brokers are less likely to discriminate in both "Advertised unit inspected" and "Similar unit inspected" (Table-5) as predicted by the broker-prejudice hypothesis (See Zhao, Ondrich, Yinger, 2006). Most of these results are robust under Specification I of the fixed effects model (Table 9) used in this paper.

The neighborhood variables reveal quite limited information on the spatial nature of discrimination. We test our hypotheses regarding the neighborhood effect of discrimination by looking at the coefficient difference between the white and minority outcomes for neighborhood variables. For the variable "Advertised unit inspected," we find evidence that discrimination against Hispanics increases with the percentage of owner-occupied housing units in a neighborhood in Specification II of bivariate probit and under both the specifications of the fixed-effects logit (Tables 7, 9 and 11). This result is consistent with customer prejudice hypothesis as discussed earlier. For the same variable we find similar evidence for Asians in Specification II of bivariate probit and Specification I of the fixed-effects logit model (Tables 7 and 9).

We also find evidence that discrimination against Asians decreases with Asians in the neighborhood (Table 9) for the variable "Advertised unit inspected." This result is consistent with the broker-prejudice hypothesis that if brokers advertise units in minority-dominated neighborhoods then the hypothesis predicts that minorities are less likely to face discrimination

in these neighborhoods. But as discussed before, this evidence is not strong enough to conclude that brokers are less prejudiced against minorities. In order to do that, we examine the effect of minority concentration on the treatment variable "similar unit inspected" and fail to find any evidence of decline in discrimination. Therefore, we do not find evidence of a general decline of discrimination against Asians based on the broker advertising a unit in an Asian-dominated neighborhood, and so do not find evidence of broker prejudice.

For the variable "Advertised unit available," the only evidence we find about discrimination from all the different specifications is that discrimination against Hispanics increases with the percentage of houses that are owner-occupied (Tables 10 and 12).

For the variable "similar unit inspected" we find that brokers are less likely to discriminate against Hispanics in a neighborhood with high homeownership rates (Table 11). We find that none of the neighborhood characteristics have any significant impact on the likelihood that the auditors are told about the availability of similar units.

The neighborhood variables that indicate the percent of whites in a neighborhood or the percent of own race for minorities in a neighborhood do not provide much information on discrimination. This likely results since our analysis is done at the audit level, which cannot capture the neighborhood interactions fully. Except for Asians, we fail to find support for the other hypothesis tests concerning neighborhood aspect of housing discrimination, which predicts that brokers are more likely to discriminate in places having a large white population than for example, the ones having a large black population. The neighborhood unobservables may be playing a role here as well. We also find comparatively higher correlation between the white and minority visit when the treatment variable is "advertised unit inspected" than when the "similar unit inspected". This is expected as both the auditors ask to inspect the same advertised unit in

their visits and so there is likely to be a strong positive common shock and it should have a big effect on the likelihood that both of them are shown the advertised unit. There is no reason for a similar shock to be present when the brokers show the auditors units similar to the advertised unit because brokers can use their own judgment in showing similar units.

Thus we need a more robust model for controlling for neighborhood unobservables.

The neighborhood characteristics that we use in this analysis are census tract information regarding the neighborhood where the advertising unit is located. This is quite restrictive for a thorough neighborhood analysis and is likely a reason why we do not find significant coefficients for the neighborhood controls for the variables "similar unit available." It may be that the real estate brokers informed the auditors of a unit similar to the advertised unit, in terms of physical characteristics, in a nearby neighborhood. But we fail to capture the neighborhood characteristics where the similar unit is located and cannot be sure that the brokers are not steering the minority customers to minority-dominated tracts. This sort of behavior is discriminatory but our models do not capture this treatment.

6. Conclusions

We perform an analysis of discrimination in Los-Angeles by using HDS 2000 and examine the effect of neighborhood on discrimination in housing sales. Our findings of broker behavior due to non-spatial factors in Los-Angeles are similar to those found in national studies of discrimination. But the reason to focus on a single city is to examine whether the neighborhood factors play a role in the discriminatory behavior of real estate agents toward minorities. We find that discrimination is caused by white customers' prejudice. We fail to find a general evidence of discrimination due to brokers' prejudice and we do not have enough

information to test for statistical discrimination. Our finding in this regard is that Hispanics and Asians are more likely to encounter discrimination in neighborhoods with higher share of owner-occupied housing. We also find that Asians are less likely to face discrimination in Asian-dominated neighborhoods but the evidence is not strong enough to conclude that brokers are less prejudiced against minorities. We fail to find evidence of the impact of the percentage of whites in a neighborhood on discriminatory behavior of brokers.

Table 1: Audit characteristics: Dependent Variables

Variable name	Variable description
Advertised unit inspected	Whether the advertised unit is inspected by the auditor
Similar unit inspected	Whether the similar unit is inspected by the auditor
Advertised unit available	Whether the auditor was told that advertised unit is available
Similar unit available	Whether the auditor was told similar units are available

Table 2: Audit Characteristics: Sample Means and Deviations of Dependent variables

Variable name	White auditor Mean	Standard Deviation	Minority auditor Mean	Standard Deviation
Advertised unit available	.587	.493	.611	.488
Similar unit available	.809	.394	.769	.422
Advertised unit inspected	.398	.490	.419	.494
Similar unit inspected	.660	.475	.608	.489

Table 3: Audit characteristics: Explanatory Variables

Variable Name	Description
	Auditor characteristics
Auditor's age	The age of the auditor
Auditor female	Whether the auditor is female
	Agent characteristics[2]
Broker white	Whether the broker was white
Broker female	Whether the broker was female
Broker's age	The age of the broker as estimated by the auditor
	Auditor's actual characteristics
Auditor homeowner	Whether auditor owned a home himself
Auditor's actual annual income	Auditor's estimated gross annual income
Auditor's accent	Whether auditor has a discernible accent
Auditor's skin tone[3]	Darkness of the auditor's skin
	Neighborhood characteristics
Percent white	Percentage of whites in the census tract where the advertised unit is located
Percent Black	Percentage of blacks in the census tract where the advertised unit is located for black-white audits
Percent Hispanic	Percentage of Hispanic in the census tract where the advertised unit is located for Hispanic-white audits
Percent Asian	Percentage of Asians in the census tract where the advertised unit is located for asian-white audits
Percent Owner occupied	Owner-occupied housing as a share of units in the census tract where the advertised unit is located

[2] The agent characteristics variables having missing information are set to their means in the sample.
[3] Auditor's skin tone always carries zero value for the whites. The auditors are ranked on a 1-4 scale, 4 being the darkest, by comparing their photographs.

Table 4: Means and Standard Deviations of Explanatory Variables

Variable	White		Minority	
	Mean	Standard Deviation	Mean	Standard Deviation
Auditor characteristics				
Auditor's age	37.68	10.75	37.01	10.09
Auditor female	.511	.501	.511	.501
Agent characteristics				
Broker white	.559	.491	.584	.494
Broker female	.422	.495	.383	.487
Broker's age	2.52	.663	2.44	.710
Auditor's actual characteristics				
Auditor homeowner	.289	.454	.173	.379
Auditor's actual annual income	2.90	1.24	2.87	1.44
Auditor's accent	0.00	0.00	.231	.422
Auditor's skintone	1.57	.628	2.56	1.13
Neighborhood characteristics				
Percent white	52.95	23.90	52.95	23.90
Percent Black	1.39	4.65	1.39	4.65
Percent Hispanic	6.33	15.18	6.33	15.18
Percent Asians	6.67	11.98	6.67	11.98
Percent Owner-occupied	64.49	12.72	64.49	12.72
No. of observations	329		329	

Table 5: Bivariate Probit Results: Specification I

Variable	Advertised Unit Inspected			Similar unit Inspected		
	White	Minority[4]	Pvalue[5]	White	Minority	Pvalue
Auditor characteristics						
Intercept	-1.05	.593	.668	-.316	-.270	.972
	(.642)	(1.02)		(.663)	(1.13)	
		.734	.073		1.56	.112
		(.958)			(1.06)	
		.203	.203		-.064	.819
		(.868)			(.951)	
Auditor's age	-.026	.007	.004	- .001	-.002	.001
	(.010)	(.009)		(.010)	(.010)	
Auditor female	.269	-.263	.030	.029	-.067	.736
	(.168)	(.224)		(.172)	(.238)	
Broker characteristics						
Broker white	.258	-.062	.095	.351	.203	.480
	(.150)	(.143)		(.157)	(.153)	
Broker female	.223	.102	.519	.186	-.021	.318
	(.142)	(.137)		(.154)	(.149)	
Broker's age	-.228	-.070	.036	.400	-.150	.001
	(.115)	(.095)		(.123)	(.108)	
Auditor's actual characteristics						
Auditor homeowner	.266	-.323	.042	-.066	.111	.588
	(.211)	(.216)		(.217)	(.230)	
Auditor's actual annual income	.139	-.016	.119	.006	-.104	.309
	(.064)	(.082)		(.066)	(.089)	
Auditor's accent	---	-.025	.916	---	-.146	.559
		(.236)			(.249)	
Auditor's skintone	.265	-.199	.030	-.101	.226	.199
	(.164)	(.148)		(.160)	(.165)	
Neighborhood characteristics						
(Percent black) x (White-Black audits)[6]	-.028	-.020	.809	- .028	-.017	.631
	(.021)	(.021)		(.015)	(.017)	
(Percent Hispanic) x (White-Hispanic audits	-.001	.001	.687	.004	.015	.379
	(.006)	(.006)		.(005)	(.010)	
(Percent Asians) x (White-Asian audits)	.003	.008	.574	.(004)	-.006	.264
	(.007)	(.008)		(.007)	(.008)	
(Pct Own)x(White-Black audits)	.002	-.001	.876	-.006	.001	.559
	(.002)	(.003)		(.006)	(.009)	
(Pct Own)x (White - Hispanic- audits)	.002	-.004	.025	-.006	-.011	.670
	(.002)	(.003)		(.006)	(.012)	
(Pct Own)x(White-Asian audits)	.002	-.005	.036	-.006	.008	.213
	(.002)	(.003)		(.006)	(.010)	

[4] The minority outcomes are presented for blacks, Hispanics and Asians consecutively.
[5] P-value is the level of significance for difference of estimated coefficients for white and minority auditor.
[6] This is an interaction term to signify whether there is any impact of a minority's racial composition of the neighborhood (where the advertised unit is located) on the minority group and its effect on the treatment. Percent Black * Black-white audits is the percentage of Blacks in the census tract in which the advertised unit was located interacted with White-Black audit group.

Table 6: Bivariate Probit Results: Specification I

Variable	Advertised Unit Available			Similar unit Available		
	White	Minority[7]	Pvalue[8]	White	Minority	Pvalue
Auditor characteristics						
Intercept	-.835	.269	.352	.480	1.68	.409
	(.645)	(1.05)		.(745)	(1.28)	
		.572	.213		2.41	.190
		(1.00)			(1.26)	
		.673	.161		1.53	.418
		(.913)			(1.07)	
Auditor's age	-.021	-.008	.231	.001	-.012	.378
	(.010)	(.009)		(.010)	(.010)	
Auditor female	.175	-.303	.073	.027	-.174	.522
	(.175)	(.224)		(.193)	(.260)	
Broker characteristics						
Broker white	.089	-.032 (.146)	.545	.331	.337	.980
	(.150)			(.171)	(.169)	
Broker female	.352	.149	.285	.114	.290	.433
	(.149)	(.143)		(.167)	(.163)	
Broker's age	-.118	.073	.209	.200	-.009	.243
	(.145)	(.100)		(.131)	(.121)	
Auditor's actual characteristics						
Auditor homeowner	.443	.017	.195	-.007	.001	.984
	(.221)	(.229)		(.238)	(.257)	
Auditor's actual annual income	.062	.130	.539	-.087	-016	.578
	(.065)	(.089)		(.068)	(.107)	
Auditor's accent	---	-.424	.095	---	.400	.135
		(.254)			(.267)	
Auditor's skintone	.496	-.085	.011	-.160	-.103	.823
	(.163)	(.159)		(.168)	(.189)	
Neighborhood characteristics						
(Percent Black) x (White-Black audits)[9]	-.045	-.024	.424	.001	-.003	.563
	(.020)	(.017)		(.003)	(.006)	
(Percent Hispanic) x (White-Hispanic audits)	.003	-.001	.671	.003	-.001	.818
	(.005)	(.006)		(.006)	(.009)	
(Percent Asians) x (White-Asian audits)	.001	-.012	.134	.003	.002	.954
	(.007)	(.008)		(.008	(.009)	
(Pct Own)[10]x(White – Black audits)	.013	.005	.398	.002	-.008	.433
	(.006)	(.009)		(.007)	(.010)	
(Pct Own)x (White-Hispanic audits)	.013	-.002	.158	.002	-.012	.389
	(.016)	(.010)		(.007)	(.015)	
(Pct Own)x(White-Asian audits)	.013	-.001	.207	.002	-.006	.554
	(.016)	(.010)		(.007)	(.011)	

[7] The minority outcomes are presented for blacks, Hispanics and Asians consecutively.
[8] P-value is the level of significance for difference of estimated coefficients for white and minority auditor.
[9] This is an interaction term to signify whether there is any impact of a minority's racial composition of the neighborhood (where the advertised unit is located) on the minority group and its effect on the treatment. Percent Black * Black-white audits is the percentage of Blacks in the census tract in which the advertised unit was located interacted with White-Black audit group.
[10] Percent Owner-Occupied Housing

Table 7: Bivariate Probit Results: Specification II

Variable	Advertised Unit Inspected			Similar unit Inspected		
	White	Minority[11]	Pvalue[12]	White	Minority	Pvalue
Auditor characteristics						
Intercept	-.888	.220	.549	-.122	-.101	.987
	(.561)	(1.05)		(.655)	(1.14)	
		.718	.114		1.77	.114
		(.964)			(1.09)	
		.636	.132		-.232	.917
		(.880)			(.949)	
Auditor's age	-.027	.006	.005	-.001	-.001	.977
	(.009)	(.009)		(.009)	(.010)	
Auditor female	.239	-.284	.033	.001	-.070	.799
	(.168)	(.224)		(.169)	(.236)	
Broker characteristics						
Broker white	.260	-.056	.101	.347	.200	.487
	(.150)	(.148)		(.161)	(.156)	
Broker female	.217	.089	.495	.183	.001	.382
	(.142)	(.137)		(.154)	(.148)	
Broker's age	-.229	.076	.029	.395	-.131	.001
	(.113)	(.094)		(.121)	(.108)	
Auditor's actual characteristics						
Auditor homeowner	.224	-.365	.045	-.077	.081	.626
	(.209)	(.212)		(.216)	(.229)	
Auditor's actual annual income	.139	-.011	.127	.031	-.106	.207
	(.062)	(.081)		(.064)	(.088)	
Auditor's accent	---	-.005	.982	---	-.144	.563
		(.235)			(.249)	
Auditor's skintone	.194	-.232	.036	-.232	.214	.065
	(.145)	(.147)		(.148)	(.164)	
Neighborhood characteristics						
(Percent white) x (White-Black audits)	.001	-.003	.500	.001	-.003	.563
	(.003)	(.006)		(.003)	(.006)	
(Percent white) x (White-Hispanic audits)	.001	.003	.706	.001	-.004	.457
	(.003)	(.005)		.(003)	(.006)	
(Percent white) x (White-Asian audits)	.001	-.005	.237	.001	.002	.871
	(.003)	(.005)		(.003	(.005)	
(Pct Own[13])x(White-Black audits)	.016	.013	.758	-.006	-.001	.618
	(.006)	(.009)		(.006)	(.009)	
(Pct Own)x (White-Hispanic audits)	.016	-.008	.023	-.006	-.008	.904
	(.006)	(.010)		(.006)	(.013)	
(Pct Own)x(White-Asian audits)	.016	-.006	.042	-.006	.007	.233
	(.006)	(.009)		(.006)	(.007)	

[11] The minority outcomes are presented for blacks, Hispanics and Asians consecutively.
[12] P-value is the level of significance for difference of estimated coefficients for white and minority auditor.
[13] Percent Owner-occupied housing in a census tract

Table 8: Bivariate Probit Results: Specification II

Variable	Advertised Unit Available			Similar unit Available		
	White	Minority[14]	Pvalue[15]	White	Minority	Pvalue
Auditor characteristics						
Intercept	-.727	.268	.398	.610	1.96	.372
	(.644)	(1.07)		(.756)	(1.35)	
		.277	.371		2.24	.268
		(1.00)			(1.25)	
		.316	.317		1.85	.338
		(.911)			(1.08)	
Auditor's age	-.021	-.007	.242	.001	-.012	.400
	(.010)	(.009)		(.010)	(.011)	
Auditor female	.160	-.282	.091	.010	-.196	.501
	(.174)	(.222)		(.188)	(.269)	
Broker characteristics						
Broker white	.087	-.050	.501	.325	.346	.932
	(.149)	(.148)		(.179)	(.175)	
Broker female	.349	.158	.306	.113	.285	.454
	(.143)	(.143)		(.169)	(.166)	
Broker's age	-.118	.094	.156	.198	.007	.278
	(.113)	(.098)		(.128)	(.120)	
Auditor's actual characteristics						
Auditor homeowner	.406	.021	.250	-.026	-.046	.957
	(.226)	(.229)		(.244)	(.258)	
Auditor's actual annual income	.083	.131	.660	-.069	-.012	.651
	(.061)	(.090)		(.066)	(.108)	
Auditor's accent	---	-.421	.094	---	-.406	.451
		(.251)			(.269)	
Auditor's skintone	.349	-.072	.051	-.244	-.130	.639
	(.147)	(.154)		(.158)	(.197)	
Neighborhood characteristics						
(Percent white) x (White-Black audits)	.002	-.001	.590	.001	-.003	.529
	(.003)	(.006)		(.004)	(.006)	
(Percent white) x (White-Hispanic audits)	.002	-.007	.376	.001	.006	.304
	(.003)	(.005)		.(004)	(.007)	
(Percent white) x (White-Asian audits)	.002	.004	.414	.001	-.004	.154
	(.003)	(.005)		(.004)	(.005)	
(Pct Own[16])x(White-Black audits)	.012	.003	.341	.001	-.010	.631
	(.006)	(.008)		(.002)	(.010)	
(Pct Own)x (White-Hispanic-audits)	.012	-.005	.115	.001	-.014	.417
	(.006)	(.010)		(.002)	(.015)	
(Pct Own)x(White-Asian audits)	.012	-.003	.184	.001	-.006	.095
	(.006)	(.010)		(.002)	(.011)	

[14] The minority outcomes are presented for blacks, Hispanics and Asians consecutively.
[15] P-value is the level of significance for difference of estimated coefficients for white and minority auditor.
[16] Percent Owner-occupied housing in a census tract

Table 9: Fixed-effects Logit results: Specification I

Variable	Advertised Unit Inspected		Similar unit Inspected	
	White	Race	White	Race
Auditor characteristics				
Auditor's age	-.193**	-.080**	.057	.046
	(.097)	(.039)	(.052)	(.036)
Auditor female	000	1.89	000	1.02
		(1.15)		(.762)
Broker characteristics				
Broker white	1.89**	.648	.517	.464
	(.784)	(.710)	(.494)	(.558)
Broker female	1.46**	.865	.111	.670
	(.522)	(.710)	(.445)	(.600)
Broker's age	-1.13**	-1.08*	.568	1.30*
	(.470)	(.601)	(.338)	(.480)
Auditor's actual characteristics				
Auditor homeowner	.613	1.44	-1.43	-.949
	(.759)	(1.07)	(.956)	(.949)
Auditor's actual annual income	.273	.237	.030	.494
	(.318)	(.482)	(.210)	(.293)
Auditor's accent	-	-.198	-	-.995
		(.808)		(.844)
Auditor's skintone	1.14	1.95**	-.603	-.368
	(.804)	(.980)	(.540)	(.624)
Neighborhood characteristics				
(Percent black) x (White-Black audits)[17]	000	-.005	000	.015
		(.068)		(.042)
(Percent Hispanic) x White-Hispanic audits)	000	.028	000	-.019
		(.024)		(.038)
(Percent Asians) x (White-Asian audits)	000	-.044*	000	.036
		(.024)		(.028)
(Pct Own[18])x(White-Black audits)	000	-.019	000	-.001
		(.050)		(.021)
(Pct Own)x (White-Hispanic audits	000	.105*	000	-.051
		(.059)		(.035)
(Pct Own)x(White-Asian audits)	000	.039	000	-.015
		(.030)		(.032)

* designates significant at the 10% level and ** designates significant at the 5% significance level.

[17] This is an interaction term to signify whether there is any impact of a minority's racial composition of the neighborhood (where the advertised unit is located) on the minority group and its effect on the treatment. Percent Black * Black-white audits is the percentage of Blacks in the census tract in which the advertised unit was located interacted with White-Black audit group.

[18] Percent Owner-occupied housing in a census tract

Table 10: Fixed-effects Logit results: Specification I

Variable	Advertised Unit Available		Similar unit Available	
	White	Race	White	Race
Auditor characteristics				
Auditor's age	-.015	-.493	-.035	.150**
	(.066)	(.462)	(.070)	(.056)
Auditor female	000	1.12	000	.090
		(.730)		(.606)
Broker characteristics				
Broker white	.602	.205	.521	.436
	(.610)	(.651)	(.553)	(.653)
Broker female	1.02**	.902	.732	-1.31*
	(.512)	(.601)	(.536)	(.743)
Broker's age	-.255	-.493	.093	-.098
	(.376)	(.462)	(.380)	(.551)
Auditor's actual characteristics				
Auditor homeowner	1.49**	1.11	-3.32	-.680
	(.724)	(.966)	(1.45	(1.07)
Auditor's actual annual income	.043	.196	-.667	-.109
	(.209)	(.330)	(.321)	(.470)
Auditor's accent		.576		1.83
		(.858)		(1.67)
Auditor's skintone	-.771	1.39**	.177	1.29
	(.635)	(.741)	(.827)	(1.07)
Neighborhood characteristics				
(Percent black) x (White-Black audits)[19]	000	-.042	000	-.011
		(.061)		(.037)
(Percent Hispanic) x (White-Hispanic audits	000	.027	000	.019
		(.019)		(.022)
(Percent Asians) x (white-Asian audits)	000	.008	000	-.013
		(.024)		(.041)
(Pct Own)x(White-Black audits)	000	.048	000	.037
		(.037)		(.022)
(Pct Own)x (White-Hispanic-audits)	000	.067**	000	-.013
		(.034)		(.041)
(Pct Own)x(White-Asian audits)	000	.017	000	.046
		(.026)		(.029)

[19] This is an interaction term to signify whether there is any impact of a minority's racial composition of the neighborhood (where the advertised unit is located) on the minority group and its effect on the treatment. Percent Black * Black-white audits is the percentage of Blacks in the census tract in which the advertised unit was located interacted with White-Black audit group.

Table 11: Fixed-effects Logit results: Specification II

Variable	Advertised Unit Inspected		Similar unit Inspected	
	White	**Race**	**White**	**Race**
Auditor characteristics				
Auditor's age	-.194**	-.071*	.072	.037
	(.093)	(.042)	(.056)	(.041)
Auditor female	000	2.03*	000	.902
		(1.10)		(.821)
Broker characteristics				
Broker white	1.94**	.792	.565	.512
	(.825)	(.740)	(.516)	(.608)
Broker female	1.27**	.756	.115	.599
	(.517)	(.713)	(.460)	(.632)
Broker's age	-1.10**	-1.00	.665*	1.51**
	(.454)	(.619)	(.365)	(.533)
Auditor's actual characteristics				
Auditor homeowner	.697	1.89	-1.36	-.953
	(.809)	(1.21)	(1.01	(1.04)
Auditor's actual annual	.231	.198	-.020	.560*
income	(.315)	(.505)	(.224)	(.301)
Auditor's accent		.346		1.12
		(.796)		(.819)
Auditor's skintone	1.22	2.28**	-.722	-.634
	(.829)	(1.05)	(.580)	(.626)
Neighborhood characteristics				
(Percent white) x (Black-White audits)	000	.010	000	.019
		(.026)		(.016)
(Percent white) x (Hispanic-White audits)	000	-.031	000	.036
		(.028)		(.029)
(Percent white) x (Asian-White audits)	000	.018	000	-.019
		(.024)		(.013)
(Pct Own)x(White-Black audits)	000	-.013	000	-.004
		(.050)		(.020)
(Pct Own)x (White-Hispanic audits)	000	.098**	000	-.069*
		(.044)		(.036)
(Pct Own) x(White-Asian audits)	000	.032	000	-.017
		(.030		(.032)

Table 12: Fixed-effects Logit results: Specification II

Variable	Advertised Unit Available		Similar unit Available	
	White	Race	White	Race
Auditor characteristics				
Auditor's age	-.004	-.036	-.056	.140**
	(.065)	(.038)	(.071)	(.057)
Auditor female	000	1.19	000	2.20**
		(.720)		(1.05)
Broker characteristics				
Broker white	.699	.372	.444	.418
	(.618)	(.686)	(.566)	(.664)
Broker female	1.05**	.915	-.556	-1.01
	(.516)	(.601)	(.556)	(.730)
Broker's age	-.288	-.551	.197	.068
	(.364)	(.479)	(.375)	(.501)
Auditor's actual characteristics				
Auditor homeowner	1.41**	1.11	-3.11**	-.153
	(.736)	(.948)	(1.48)	(1.12)
Auditor's actual annual income	.013	.055	-.642	-.096
	(.218)	(.332)	(.333)	(.502)
Auditor's accent	-	-.419		1.91
		(.887)		(1.63)
Auditor's skintone	-.761	1.46**	.323	1.60
	(.605)	(.708)	(.839)	(1.05)
Neighborhood characteristics				
(Percent white) x (White-Black audits)	000	.013	000	.008
		(.016)		(.019)
(Percent white) x (White-Hispanic audits)	000	-.035	000	-.026
		(.020)		(.025)
(Percent white) x (White-Asian audits)	000	.007	000	-.005
		(.015)		(.016)
(Pct Own)x(White-Black-audits)	000	.047	000	.033
		(.038)		(.021)
(Pct Own)x (White-Hispanic audits)	000	.076**	000	.006
		(.035)		(.038)
(Pct Own)x(White-Asian audits)	000	.021	000	.045
		(.025)		(.028)