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PROINTEGRATIVE SUBSIDIES AND THEIR EFFECT ON HOUSING MARKETS: DO RACE-BASED LOANS WORK?

by Brian A. Cromwell

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Introduction

Prointegrative housing subsidies--low-interest loans made to homebuyers on the basis of race in order to promote and maintain racial integration--are a new and controversial development in open-housing policy. Typically, black homebuyers receive subsidies to buy in predominately white areas, while white homebuyers receive subsidies to buy in predominately black or integrated areas. Programs now exist in the Detroit, Chicago, Philadelphia, and Cleveland metropolitan areas, where funds are provided both by private foundations and local governments. The impact of these programs on housing markets has received little attention in the economics or urban studies literature, however.[1]

Race-based subsidies can affect a local housing market through several channels. First, those who qualify for a subsidy can outbid other would-be purchasers, placing upward pressure on housing values. Therefore, controlling for house quality, one would expect subsidized transactions to command higher prices. Second, subsidies can be a useful marketing tool for attracting potential buyers to an area, possibly increasing demand and raising prices.

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[1] Galster (1990) examined the impact of affirmative marketing strategies on racial change in Cleveland Heights and Shaker Heights, Ohio, between 1970 and 1980. He found that these programs resulted in greater integration of initially all-white areas and less racial change in substantially integrated areas. He found no evidence that the programs increased white demand in integrated areas. However, the period he examined predated the prointegrative loan program.

A more important effect of these programs, however, may be their impact on expectations of future racial composition. As discussed in Chambers (1988) and Galster (1990), the dynamics of racial change in many metropolitan areas involve the evaporation of white demand--known as white flight--following a neighborhood's initial integration, leading to subsequent resegregation. Popular wisdom holds that this process of resegregation is accompanied by reduced housing prices and deteriorating public services.[2] Empirical evidence suggests that, controlling for house quality, housing prices are lower in neighborhoods undergoing rapid transition from all white to all black. When a community initiates or continues to support a raced-based subsidy program, this can signal a firm commitment to maintaining integration. To the extent that such a program reduces the risk of resegregation and the potential financial loss to homeowners, its initiation can have a significant positive effect on housing prices and white demand.

This paper examines the impact of the most extensive race-based subsidy program administered by a local government: the Fund for the Future of Shaker Heights (FFSH). The City of Shaker Heights, Ohio (in suburban Cleveland), initiated the FFSH in May 1986, making it the longest-running program of its kind in the country. In 1989, the FFSH received the Ford Foundation's annual award for "innovations in state and local government." Open-housing activists consider the program a model for other communities that wish to promote and maintain racial integration.

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2 See the discussion of racial change in Husock (1989).

The FFSH provides low-interest loans to whites who buy in the integrated neighborhoods of the suburb and blacks who buy in the predominately white areas. Because of the distribution of race and housing stock in Shaker Heights (the predominately white neighborhoods consist of luxury homes, while the integrated neighborhoods consist of relatively modest homes), the program has effectively been directed toward maintaining white demand. This is particularly true in the neighborhood known as Lomond, where a significant number of home purchases include subsidies (a large majority of loans made by the FFSH have facilitated purchases there).

To examine the effect of the FFSH loan program on the Lomond area, I first obtained data for all single-family home purchases in Shaker Heights and in a control group of surrounding communities for the years 1983 through 1989. These data were then merged with detailed information on the racial composition of neighborhoods at the census-tract level and on house quality for each transaction. Given the panel nature of the data, I was able to control for fixed neighborhood characteristics. I also obtained transaction-level data on the race of buyers and sellers for sales within the Lomond neighborhood.

The empirical analysis presented here has two parts. First, I estimate the direct impact of the FFSH subsidies on racial composition within Lomond with a logit model of the probability that a house transaction will involve a white seller or buyer. Second, I measure the financial effects of the program through a simple hedonic price equation that explains transaction prices as a function of house quality, neighborhood racial composition, and fixed neighborhood effects. (The limitations of hedonic price estimation are

discussed in detail in section 3.) To identify the program's impact on the Lomond housing market, a measure of loan eligibility is entered into the price equation in order to ascertain whether the market intervention systematically changed the transaction prices. I use variation in loan eligibility amounts over time and across streets to distinguish the impact of the loan program from general appreciation in the area.

Results suggest that the FFSH subsidies have contributed to racial stability, and that initiation of the program coincided with appreciation of housing prices in the Lomond area. Subsidies have had the most impact on integrated streets where the nonwhite racial composition is between 30 and 70 percent. Since the FFSH was established in 1986, the probability that whites will buy houses on a street within this range has risen approximately 20 percentage points, while house prices, which had lagged behind those of comparable communities, have appreciated 5.8 percent per year. These estimates cannot identify, however, significant appreciation due to variation in loan amounts over time, suggesting that the fixed signaling effect of the program dominates the financial effects of the relatively small subsidies.

This paper is organized as follows. Section 1 discusses previous research on race and housing and reviews the initial efforts at integration maintenance. Section 2 examines the history of the Shaker Heights loan program and the racial change and housing prices in Lomond. Section 3 reviews the data sources used for estimation and discusses the econometric specifications employed. Section 4 presents the logit estimates on racial change, and section 5 presents the hedonic price estimates. Section 6 concludes.

1. Previous Race and Housing Studies

Research dealing with the impact of racial composition and racial change on housing markets typically measures whether black households pay different housing prices than white households, with most studies measuring racial price differentials in terms of differences across areas of varying racial composition. Mieszkowski's (1979) review and an update by Chambers (1988) suggest that analyses using 1950s and 1960s data tend to show higher housing prices in black areas, while those employing more recent data are more likely to report lower prices in predominately black or changing neighborhoods.

Studies using 1960s data for single metropolitan areas show that blacks paid more for equivalent housing in black and integrated neighborhoods (see King and Mieszkowski [1973], Yinger [1978], and Schafer [1979]). Follain and Malpezzi (1980), however, use the Annual Housing Surveys of 1974-76 to measure Standard Metropolitan Statistical Area (SMSA)-wide price differentials for 39 SMSAs and find discounts for black owners in 34. Schnare and Struyk (1977) report that for Boston and Pittsburgh, premiums in black areas decreased substantially between 1960 and 1970.

Studies such as the one by Follain and Malpezzi suffer from their inability to measure the racial composition of neighborhoods and other neighborhood characteristics accurately. Chambers (1988) shows that controlling for fixed neighborhood attributes reduced the estimated price discount for blacks from 20 percent to 7 percent in Chicago. Results reported here are based on unusually detailed annual information on race at the

census-tract level (or, in some cases, even at the street level). The panel nature of the data allows for the control of fixed neighborhood effects as well.

Determinants of Racial Change

A standard explanation for the disappearance of the price premium in black neighborhoods is that white suburbanization has increased the supply of housing available to blacks, relieving the demand pressure that had built up in many black areas in the 1950s and 1960s (especially in northern and midwestern cities).[3] However, the dynamics of suburbanization can also involve the reduction of white demand in those neighborhoods first opened to blacks in the 1970s.

Over time, of course, the proportion of nonwhite residents in a given neighborhood depends on the racial composition of the out-movers and in-movers. The empirical literature has centered on the relative importance of the various components of white/nonwhite in- and out-migration. (See Galster [1990] for a recent review.)

Evidence on out-migration is mixed. Early studies, including Mayer (1960) and Damerall (1968), find that the probability of white out-migration increases with nonwhite in-migration. Opinion poll data also show that whites become "uncomfortable" and are more likely to move as the proportion of nonwhites increases. Other studies, however, suggest that white mobility is

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3 This section draws in part on Chambers (1988).

unaffected by racial composition.[4] Wilson (1983) finds that, during the 1960s, white out-migration rates from integrated tracts were significantly higher than from all-white areas, but only for those neighborhoods that would have been expected to have low mobility. The differential disappears when tracts with higher predicted mobility are compared.

The impact of racial composition on in-migration is more obvious. Opinion polls have consistently shown that most whites prefer to live in predominantly white neighborhoods, while most blacks and Hispanics favor areas with balanced proportions of whites and nonwhites.[5] Galster (1982) supports these findings in an econometric study of the impact of racial composition on bids by whites and nonwhites for comparable housing. Other studies of actual mobility show that, all else equal, whites are less likely to choose neighborhoods with higher percentages of nonwhite residents (see Wilson [1983]).

Housing activists have charged that racial change is also spurred by unethical and illegal real estate practices. Blockbusting, panic peddling, and steering have resulted in whites fleeing neighborhoods undergoing racial change. Although declared unlawful, flagrantly racist practices in real estate sales, financing, renting, and appraising are alleged to persist because of weak enforcement of fair-housing laws. Even normal real estate practices, such as door-to-door or telephone solicitation for listings and intensive use of "for sale" signs, can be indistinguishable from racially

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4 See Wolf and Lebeaux (1969), Guest and Zuiches (1971), and other papers cited in Galster (1990).

5 See Farley et al. (1978) and Schuman, Steeh, and Bobo (1985).

discriminatory ones, because these "benign" practices may also encourage whites to sell.[6]

Empirical evidence thus suggests that the reduction of white demand in integrated and racially changing neighborhoods is an important element of the dynamics of racial change. These dynamics--possibly spurred by real estate practices--can result in the rapid resegregation of neighborhoods. The experience in many communities has been that "integration is no more than the brief span of time between the arrival of the first black and the departure of the last white."[7] Chicago suburbs such as Dixmoor, East Chicago Heights, Markham, Maywood, Phoenix, and Robbins and Cleveland suburbs such as East Cleveland and Warrensville Heights have been unable to maintain racially mixed housing patterns and school enrollment. Other suburbs such as Blue Island, North Chicago, Chicago Heights, or Hammon in the Chicago area and Garfield Heights in the Cleveland area have remained integrated, but have black and white households concentrated in separate neighborhoods.[8] The reduction in white demand for homes in integrated and racially changing areas is consistent with the presence of lower housing prices in those areas.

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6 Lind (1982) describes several court cases involving such practices.

7 Alfred and Marcoux (1970).

8 See Lind (1982).

Integration Maintenance Efforts

Community groups and local governments have engaged in a wide range of activities to counteract the dynamics of racial change that eventually lead to resegregation.

Illegal real estate practices are monitored through fair-housing "audits" by persons (testers) who pose as would-be homebuyers and then report any unethical or illegal treatment.[9] In addition, activists poll recent homebuyers about their experience in the marketplace. Studies of real estate advertising in newspapers have also documented racial discrimination. When illegal real estate practices are uncovered, litigation is often the next step.

Some municipalities also regulate legal but unfavorable real estate practices through legislation. In particular, direct solicitation for sales listings and the posting of "for sale" signs, practices closely associated with blockbusting, have been targeted. Other cities--including Shaker Heights and Cleveland Heights--ban all signs from front yards or residential property. Bellwood, Illinois, requires real estate firms to secure a permit in order to solicit door to door, by mail, or over the telephone. A Cleveland Heights ordinance establishes a means by which homeowners can inform realtors that they do not wish to be approached.

Rather than adopting restrictive and mandatory sign and solicitation bans, many municipalities have established housing and community development offices to implement affirmative action strategies. Most of these strategies

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9 See Yinger (1986).

have a marketing aspect. For instance, advertising, often directed at potential white homebuyers, is used to project a favorable image of the community. Housing information services may also be provided. Shaker Heights and Cleveland Heights; Oak Park, Illinois; Southfield, Michigan; and University City, Missouri, are among those cities furnishing substantial information for individual buyers and renters. In some cases, such housing services urge potential residents to consider neighborhoods where their presence would not contribute to segregation. Sometimes, however, these services are denied to whites considering predominantly white areas or to blacks considering integrated or predominantly black areas. Several communities sponsor educational programs for realtors and provide incentives for them to cooperate with affirmative marketing strategies.

Finally, an offshoot of affirmative marketing plans is the use of financial incentives to maintain racial integration, most often taking the form of low-interest loans. Community groups and fair-housing and religious organizations were the first to try such an approach. In an effort to attract white homebuyers, neighborhood groups in Shaker Heights made loans on a small scale beginning in 1960. The Fund for an Open Society, in Philadelphia, was established in 1978 to subsidize the movement of blacks into predominately white suburbs. Jewish residents in Cleveland Heights and Southfield, Michigan, established funds to promote the in-migration of young Jewish families, thereby protecting their own substantial investments in local cultural and religious institutions. The first fund explicitly supported by a local government rather than by private interests was the FFSH, to which we now turn.

2. The Fund for the Future of Shaker Heights

The intervention of Shaker Heights community groups and government into real estate markets in order to promote stable racial integration dates back to 1957. Like other heavily industrial Great Lakes cities, Cleveland experienced major black in-migration during and immediately after World War II. By 1960, the city was 28.6 percent black, with black neighborhoods expanding out of the traditional ghetto located east of the Cuyahoga River, which serves as a significant dividing line between the east and west sides. Because black in-migration coincided with significant white flight from the city proper, Cleveland was 43.8 percent black by 1980, while most of the city's eastern neighborhoods (including those abutting Shaker Heights) were more than 90 percent black.

Seeking to escape crime and deteriorating local public services, blacks also moved into the adjoining inner-ring communities, especially after the 1967 riots. Certain suburbs, including East Cleveland and Warrensville Heights, changed from predominately white to predominately black within a decade. Shaker Heights, however, has been able to maintain a relatively stable racial composition for more than 30 years. From 13 percent in 1968, the current nonwhite population now stands at 29 percent.

Shaker Heights was developed in the 1920s by the Van Sweringen brothers, who envisioned it as a model community designed around a rapid transit line that would provide easy access to downtown Cleveland. The city included housing for a wide range of income groups, with distinct neighborhoods designed to provide intra-community mobility (see figure 1).

Relatively modest houses on small tracts were built in the southern neighborhoods of Ludlow, Lomond, and Moreland, which abut Cleveland, while mansions were developed in the northern part of the city. As shown in table 1, housing prices in Lomond are more comparable to those in the rest of the eastern Cuyahoga County communities than to prices in the northern section of Shaker Heights.

Before the courts struck down restrictive housing covenants in 1948, blacks were banned from purchasing homes in Shaker Heights, as were Jews and Catholics. When a black dentist moved into Ludlow in 1955, white residents feared that the rapid racial change taking place in adjacent Cleveland neighborhoods would also occur in their own community. Responding to the proliferation of "for sale" signs, residents formed the Ludlow Community Association in 1957 to counteract adverse real estate practices and to encourage whites to buy homes in the area. These actions were the first of their kind and received national attention.[10] In 1961, the association began to make short-term loans to prospective white buyers.

Residents of Lomond responded similarly to integration. In 1963, a community association was formed to promote the neighborhood, prospect for white buyers, and make a limited number of loans to whites interested in purchasing homes on blocks with heavy concentrations of blacks. In 1967, the Shaker Heights Housing Office was established with the financial support and

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10 See "Ludlow: A Lesson in Integration," Reader's Digest, 1965.

supervision of the City Council and the Board of Education. This city-wide organization took over many of the marketing and prospecting activities heretofore conducted by the community groups.

The success of these early efforts to maintain racial integration in Shaker Heights was mixed. Moreland, historically the most blue-collar neighborhood, became predominately black by 1980. Ludlow, on the other hand, has remained stable since the late 1960s (averaging about 50 percent black). Lomond claimed the greatest success in attracting white homebuyers, with sales to whites rising from 49 percent in 1966 to 68 percent in 1969.[11]

In the mid-1980s, however, Lomond was perceived as becoming predominately nonwhite, particularly in the southwestern areas adjoining the Moreland neighborhood and Cleveland. Racial data collected by the Shaker Heights Housing Office--which monitors racial occupancy at the house level--confirmed this trend. In just four years (1982-86), the percentage of nonwhite residents in the western half of Lomond shifted from 40 percent to 65 percent, while in the eastern half of the neighborhood that measure grew from 29 percent to 34 percent. As shown in table 2, housing sales to whites declined from 81 percent of sales in 1981 to 47 percent in 1985. Housing prices, which appreciated 14 percent between 1980 and 1985 in the rest of the eastside communities, were flat in Lomond.

The Shaker Heights Housing Office, concerned about maintaining the long-term integration of the southern Shaker neighborhoods, launched the FFSH in 1986. Under the program, white homebuyers in the integrated neighborhoods

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11 See Alfred and Marcoux (1970).

of the city are eligible for low-interest loans of up to $5,000, while black homebuyers are eligible for similar loans if they buy in the suburb's predominately white areas. Because the predominately white neighborhoods consist of luxury homes while the integrated neighborhoods consist of relatively modest homes, the program has effectively been directed toward maintaining white demand, particularly in Lomond. Of the 75 loans made by 1990, only four went to blacks. Of the remaining 71 loans, 66 were applied to home purchases in Lomond. City officials defend this imbalance by noting that they support a regional program (the East Suburban Council for Open Communities, formed in 1983) that extends loans to black homeseekers in six formerly all-white communities east of the inner-ring suburbs.

FFSH directors have varied the loan amounts for which purchasers are eligible over time and over specific sections of Lomond. As shown in figure 2, loan amounts were initially set at $3,000 for the entire neighborhood. In January 1987, this figure was increased to $4,000 for houses in the western section. The figure for western Lomond was increased again in April 1990, to $5,000, but the boundary was shifted west. I use this variation in loan amounts over time and across sections of Lomond in an effort to distinguish the financial impact of the loan amounts from the fixed effects resulting from establishment of the program.

3. Data and Estimation

The econometric analysis presented here attempts to identify three separate potential effects of the FFSH loan program: 1) the direct effect on racial composition, 2) the fixed impact of the initiation of the

program on housing prices, and 3) the influence of varying the subsidy rate over time.

The first effect--the impact of the FFSH on racial composition and the impact of racial composition on housing prices--ties this work to other studies of race and housing. I also look for evidence that the racial discount (premium) for housing prices within Lomond differs from that of the surrounding communities. The second effect measures whether the mere existence of a subsidy program--with its accompanying potential impact on expectations of future racial composition--has an influence on house prices. The third effect measures the importance of the subsidy level itself on housing values. The present value of the subsidies is small. The $5,000 loan has a value of $800 to $1,200, depending on the discount rate used.[12] Nonetheless, for liquidity-constrained homebuyers, particularly first-time purchasers, the loan can provide an important financial incentive.

In practice, disentangling the fixed effect of the program from the subsidy effect is difficult. I rely on the variation in loan amounts over time and across streets to identify the latter. (I also identify transactions that use the subsidy.) To examine the fixed effect of the program, I compare appreciation in Lomond to that in the surrounding communities to ascertain whether a shift in prices coincided with the initiation of the program.

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12 Discount rates of 10 percent to 18 percent were used.

Estimation Approach

Hedonic models focus on markets in which a generic commodity can embody varying amounts of a vector of attributes. In empirical implementation of these models, one major focus is to estimate how the price of one unit of the commodity varies with the set of attributes it possesses. Another focus of study is to estimate demand and supply functions for attributes of the product.

However, as Epple (1987), Follain and Jimenez (1985), and others point out, some seemingly natural specifications of the stochastic structure of hedonic models prove to be incompatible with their equilibrium conditions.[13] Epple shows that careful specification of the sources of error and orthogonality conditions permits identification and estimation of a hedonic model, but the requisite orthogonality conditions prove to be relatively strong. To be satisfied in practice, they require an exhaustive set of product, demander, and supplier characteristics. The problems are particularly acute for estimation of demand and supply equation parameters.

In hedonic applications, however, the price equation is typically estimated by ordinary least squares, with the supply of attributes and tastes of consumers assumed exogenous. These estimates are consistent if 1) price

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[13] The literature on applying hedonic price models to housing markets is lengthy. Rosen (1974) first proposed an estimation procedure to surmount the problem posed by the absence of observable prices for attributes. His suggestion sparked a number of applications, including Murray (1978), Witte, Sumka, and Erekson (1979), Harrison and Rubinfeld (1978), Linneman (1980), Ellickson (1981), and Halvorsen and Pollakowski (1981). Criticism of these applications appears in Brown and Rosen (1982), Epple (1987), Bartik (1987), Diamond and Smith (1985), and Follain and Jimenez (1985). Alternative estimation strategies are discussed in Kanemoto (1988), Kanemoto and Nakamura (1986), and Quigley (1982).

and product characteristics are measured without error, 2) no product characteristics are omitted, and 3) the error term in the price equation is uncorrelated with the error vector in the demand equations. Due to data limitations, I do not attempt to estimate the parameters of the demand equations, but instead focus on estimating the hedonic price equation under the above assumptions. The high-quality price and racial composition data, extensive set of house characteristics, and ability to control for fixed neighborhood effects reduce the probability of bias due to measurement error or omitted variables. Moreover, this approach allows my results to be compared with those of previous studies of race and housing.

With respect to estimating the impact of the loan program on racial composition, data limitations again prohibit estimating a full structural model of white/black demand and housing supply. Therefore, I use a logit model and estimate two reduced-form equations of the probability that a house will be sold (purchased) by a white. The independent variables are assumed to capture the implicit structural relationships of both white and black selling and buying propensities. This approach follows Galster (1990), who used reduced-form equations to model racial change at the census-tract level. The results, however, should be interpreted cautiously as an econometric characterization of a housing market, not as estimates of housing demand.

Data

I obtained data on all single-family home purchases in Shaker Heights and in a control group of surrounding communities for the years 1983 through 1989. I then merged this information with detailed data on house quality

acquired from property tax records. The data were generously provided by Thomas Bier of Cleveland State University, who has done extensive research on housing in Cleveland and whose staff at the school's Urban Studies Center has invested heavily in cleaning up the information and checking for accuracy. The 87 quality variables listed in table 3 are unusually detailed for a housing study of this nature. In addition to standard measures of lot size and living area, this study includes ten measures of exterior wall construction, six measures of housing style, eight measures of construction quality, five measures of roof style, and six measures of roofing material.

I also obtained estimates on the racial composition of neighborhoods at the census-tract level. The Cuyahoga Plan, a local fair-housing organization, publishes yearly estimates of racial change in Cleveland and its environs based on births and deaths at area hospitals. I applied their estimated rates of change to the 1980 census figures for nonwhite residency in order to obtain annual estimates of racial composition for each census tract. Within the Lomond neighborhood (which spans parts of three census tracts), street-by-street estimates of racial composition were obtained using data compiled by the Shaker Heights Housing Office on the race of each homeowner, as well as on buyers and sellers.

4. Effect of the FFSH on Racial Composition

Since its initiation in May 1986, the FFSH has made approximately 20 loans per year, principally for purchases in Lomond. Simple statistics support the position that the loan program has stabilized racial composition there. As shown in table 2, sales to whites, which bottomed out at 47 percent

in 1985, rose to 70 percent in 1988 and stood at 59 percent in 1989. Racial composition in the eastern and northern sections of Lomond has stabilized at 34.9 percent and 36 percent nonwhite, respectively, since 1986. Western Lomond has continued to increase in nonwhite racial composition, but at a slower pace, shifting only four percentage points between 1986 and 1989 (compared to a 20 percent shift in the previous three years).[14]

To examine the effect of the FFSH on racial composition more systematically, I use a logit probability model to explain the likelihood that house transactions within Lomond will involve 1) a white seller and 2) a white buyer.[15] The basic form of the model is shown in equation (1).

$$(1)\quad LOG(P_i/1-P_i) = \alpha + ß_1(NONWHITE\%_{it}) + ß_2(QUALITY_i) + ß_3(LOMONDYR_t) + e_{it},$$

where

P_i = the probability that a seller (buyer) is white,

$NONWHITE\%_{it}$ = percent nonwhite population on a particular street in year t,

$QUALITY_i$ = a vector of house-quality variables for house i,

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14 Street-by-street data on racial composition are available from the author upon request.

15 For a discussion of the logit model, see Pindyck and Rubinfeld (1981).

$LOMONDYR_t$ = a trend variable equal to zero in 1980,..., equal to nine in 1989,

i = 1,...,317 single-family house transactions in Lomond, and

t = 1980,....,1989.

I estimate equation (1) for sales (and buys) using maximum-likelihood nonlinear estimation with the SAS LOGIST procedure for 317 sales in Lomond between 1980 and 1989.[16] The sample is limited to single-family sales for which the race of both the buyer and the seller was known by the Shaker Heights Housing Office. Various forms of the specification are estimated, including entering NONWHITE% as a continuous variable, entering NONWHITE% and NONWHITE% squared, and breaking NONWHITE% into a set of dummy variables for different categories of NONWHITE%. In the latter specification, I create a set of dummy variables (NONWHITE%10-20, NONWHITE%20-30, ..., NONWHITE%80-90) that equal one if the percentage of nonwhites on the street is between 10 and 20 percent, 20 and 30 percent,...., 80 and 90 percent, respectively. I report these results because they allow for a more flexible model than does just including NONWHITE% linearly. The qualitative nature of the results is the same for all specifications.

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16 See Harrell (1980).

I first estimate equation (1) with the vector $QUALITY_i$ variables (shown in table 3) included. With a few exceptions, such as ATTACHED GARAGE and AIRCONDITION, these variables are statistically insignificant. A joint test of the variables rejects the hypothesis that they have explanatory power for white sales and white buys. This is not surprising. The Lomond housing stock was built by one developer, so housing characteristics, lot size, and construction quality are homogeneous throughout the neighborhood. Although depreciation may vary with race (income), Shaker Heights has a stringent point-of-sale inspection that insures adequate maintenance. What <u>does</u> vary across the neighborhood is racial composition. When the $QUALITY_i$ variables are included, the estimated coefficients for the NONWHITE% variables are little changed. Their statistical significance, however, declines from the 99 percent confidence level to the 90 percent confidence level. For reasons of space, I report the regression results that exclude the $QUALITY_i$ measures, although the qualitative nature of the findings remains the same.

Model 1 includes a dependent variable, WHITESELL, that equals one if a housing transaction involves a white seller. This was the case in 242 of the 317 sales in Lomond observed over the 1980-89 period. The results are reported in column 1 of table 4. The coefficients for NONWHITE%10-20 through NONWHITE%60-70 are all significant at the 95 percent confidence level, although they are declining in absolute value. This implies that the probability of sale by a white decreases with the white racial composition of the neighborhood. (NONWHITE%80-90 is the omitted category.) This is as expected, since the population of potential white sellers also declines.

A more useful interpretation of these results is illustrated in figure 3. For a street that is 85 percent white, the probability of sale by a white is 92 percent. For streets that are 55 percent and 25 percent white, the respective probabilities of sale by a white are 80 percent and 65 percent. These results reflect two possible influences. First, white homeowners within Lomond are potentially more mobile than black homeowners and are thus more likely to sell. (Conventional wisdom at the Shaker Heights Housing Office states that whites in Lomond tend to be either young families purchasing their first homes, upwardly mobile professionals, or transferees.) Second, the high probability of white sales relative to racial composition suggests white flight.

I assume that the white propensity to sell is unaffected by the FFSH and contrast the results from Model 1 with the probability of white purchases. (Relaxing this assumption is an area for future research, which should perhaps include joint estimation of the probabilities of white sales and buys.)

Model 2 estimates the probability that a white will purchase a house in Lomond. As in Model 1, a trend variable is included. However, Model 2 also incorporates a shift variable, LOANYR, that increases by one for each year following the initiation of the FFSH loan program. (LOANYR=1 in 1986, ..., LOANYR=4 in 1989.) As with Model 1, the coefficients on NONWHITE%10-20 through NONWHITE%60-70 are statistically significant and decline in absolute value. As shown in figure 4, the probability of a buy by a white decreases as the nonwhite racial composition of the street increases. In 1985, the year immediately preceding establishment of the FFSH, the probability of a white buying a house on an 85-percent-white street was 64 percent, while the

probability of a white buying a house on a 25-percent-white street was only 18 percent.

The probability of whites buying in Lomond steadily decreased between 1980 and 1986. The coefficient for LOMONDYR is -0.1693 and is significant at the 95 percent confidence level. This downward trend reversed in 1986, coinciding with the initiation of the FFSH. The estimated coefficient on LOANYR is 0.4080 with a standard error of 0.1624 and is significant at the 95 percent confidence level.

To further explore the effect of the FFSH, I interact LOANYR with three variables measuring the degree of nonwhite composition. Model 3 includes HIGHNW=1 for streets with a 70-100 percent nonwhite composition, MODNW=1 for streets with a 30-70 percent nonwhite composition, and LOWNW=1 for streets with a 0-30 percent nonwhite composition. Results suggest that the FFSH has a significant effect (at the 95 percent confidence level) on white purchases on streets that are 30-70 percent nonwhite. The results for HIGHNW and LOWNW are positive, but significant only at the 90 percent and 80 percent confidence levels, respectively. (Relatively few transactions were observed in these areas.)

To interpret these results, I again return to figure 3. Prior to the initiation of the FFSH, the probability of a white buy was lower than the probability of a white sell for all levels of nonwhite street composition. The vertical distance between the two functions can be interpreted as a measure of

the pace of racial change.[17] For streets that are 25 percent nonwhite, whites comprised 82 percent of the sales but only 58 percent of the buys, suggesting that a net 24 percent of the transactions involved a change of ownership from white to black. For streets that are 75 percent nonwhite, the white sale-to-buy ratio was 65 to 18, suggesting that 47 percent of the sales involved a racial change.

Figure 4 illustrates the effect of the FFSH on white buys as estimated in Model 3. Upon initiation of the loan program in 1986, the probability of white buys shifted up, but still remained below the probability of white sells. For a street with 55 percent nonwhites, the probability shifted from 42 to 51 percent. By 1989, the probability of white buys exceeded the probability of white sells for streets with nonwhite composition of 30 percent or less. For a street with 55 percent nonwhites, the probability of a white buy rose to 75 percent, a 33-percentage-point increase from pre-FFSH levels. For streets with a high number of nonwhite residents, however, the probability of white buys remained low.

An alternative measure of the loan program's impact enters the dollar amount for which a house is eligible into the specification (rather than a shift variable that followed the initiation of the program) and yields qualitatively similar results. The statistical fit, however, is not as good as the results reported here. This is consistent with the findings reported

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17 This assumes that the two functions are independent, an area for future research.

in section 5, which suggest that the fixed effect of the loan program on expectations of racial composition dominates the financial impact of the subsidies.

In short, these estimates suggest that the FFSH had a significant positive impact on the probability of white purchases in Lomond. Racial composition was stabilized in areas with 0-30 percent nonwhites, and white demand was significantly increased in areas with 30-70 percent nonwhites. The estimated impact on high-minority areas (more than 70 percent nonwhite) was positive but smaller.

5. Effect of the FFSH on House Prices

Following previous studies on race and housing, I estimate a simple hedonic price equation that explains transaction prices as a function of house quality, neighborhood racial composition, and neighborhood fixed effects. The basic form of the regression is shown in equation (2).

$$(2)\ LOG(PRICE_{it}) = \alpha + \beta_1 (NONWHITE\%) + \beta_2 (QUALITY_i) + \beta_3 (FIXED_i) + \beta_4 (LOMOND_t) + \beta_5 (COUNTY_t) + \beta_6 (OTHSHAKER_t) + e_{it},$$

where i = 1,....,26,166 transactions and t = 83-89. [18]

* * * * * * * * * * * *

[18] Note that OTHSHAKER83 and COUNTY83 are set equal to zero to avoid perfect colinearity.

PRICE is the transaction price of the 26,166 sales observed between 1983 and 1989 in the eastside communities selected for the study.[19] NONWHITE% is the racial composition reported in the census tract. QUALITY is the vector of house-quality measures. FIXED is a vector of census-tract dummy variables. LOMOND, COUNTY, and OTHSHAKER are annual dummy variables that measure appreciation in Lomond, other communities, and other Shaker Heights areas, respectively.

I enter measures of loan eligibility into the specification in order to ascertain whether the market intervention systematically changed transaction prices. These measures include LOAN, which equals the amount of loan for which the house is eligible, LOMONDYR, which measures the trend in Lomond house prices beginning in 1983, and LOANYR, which measures any shift in appreciation coinciding with the initiation of the loan program in 1986.

Median prices in Lomond remained flat between 1982 and 1985, while the rest of the eastside communities experienced an average appreciation rate of 10 percent. Prices in Lomond jumped 7 percent in 1986 upon initiation of the loan program, however, and had caught up with those of the other communities by 1988.

To control for the impact of the loan program on housing prices more systematically, I estimate equation (2) controlling for racial composition, house quality, and neighborhood fixed effects. I first estimate the model excluding variables related to the loan program. Results are shown in

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19 The communities chosen were the City of Cleveland neighborhoods contiguous to the eastern suburbs, and all of the suburbs extending eastward to Interstate 271, the circumferential highway.

table 5.

Model 4 excludes the racial composition variables but includes the quality variables and neighborhood fixed effects. Parameter estimates for the quality variables are contained in appendix A.[20] The quality variables in general have parameter estimates of the expected sign and of reasonable magnitude. AGE has a negative and significant effect on prices. LIVING AREA and LOT SIZE have positive and significant effects. FULL BATHS and HALF BATHS do not have significant effects, but PLUMBING FIXTURES does. FIREPLACES, AIR CONDITIONING, HARDWOOD FLOORS, and SWIMMING POOL have the expected positive signs and are statistically significant. The CONSTRUCTION GRADE and CONDITION variables are all statistically significant and are ranked in the expected order.

The appreciation in Lomond house prices that began in 1986 and that is seen in the simple statistics appears in the $LOMOND_t$ dummy variables as well. (The omitted neighborhood dummy variable is the Shaker Heights census tract immediately north of Lomond, in 1983.) Prices, which were 11 percent below the control neighborhood in 1983, climbed 19 percent between 1985 and 1989. Significant appreciation also occurred in the rest of the city over the same period, however. Because the market in northern Shaker Heights is substantially different in terms of price level and house characteristics, appreciation rates in LOMOND and OTHSHAKER may not be comparable. Although

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20 Parameter estimates for the fixed neighborhood effects are not reported but are available upon request.

the appreciation in Lomond began in 1985 upon initiation of the loan program, an alternative interpretation is that excess demand for OTHSHAKER houses pulled up the Lomond prices.

Model 5 adds variables on racial composition. NONWHITE% is the racial composition for houses outside of Lomond (and equals zero within Lomond). NONWHITE% LOMOND is the racial composition measured at the street level for houses within Lomond (and equals zero outside of Lomond). The parameter estimates for the two variables are statistically significant and remarkably similar, at -0.1574 and -0.1697 for NONWHITE% and NONWHITE% LOMOND, respectively, with t-statistics of 2.65 and 2.16. This suggests that a 10-percentage-point shift in racial composition toward nonwhite reduces prices 1.6 percent outside of Lomond and 1.7 percent within Lomond. To the extent that the FFHS stabilized racial composition, the program seems to have had a significant direct effect on housing prices.

Model 6 omits the neighborhood fixed effects (but includes the quality variables). The estimated coefficient on NONWHITE% doubles to -0.3372 from results seen in Model 4, confirming Chamber's evidence that unobserved neighborhood effects significantly influence the white/nonwhite differential.

The estimated impact of the loan program is reported in table 6.[21] Note that the specifications include a trend variable (LOMONDYR) rather than

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21 Except as noted, estimated quality and year effects for Models 7 through 11 change little from those reported in table 4 and are available from the author.

yearly fixed effects (LOMOND83-LOMOND89). Constraining appreciation in Lomond to this trend allows for the effect of the FFSH to be estimated from variation in the loan amounts over time and across streets within Lomond.

Model 7 includes the variable LOAN, which equals the amount of loan for which the house is eligible (in thousands of dollars). The estimated coefficient is 0.0213 with a t-statistic of 1.48 and is not significant at conventional levels. Model 8 interacts loan amounts with dummy variables for high, moderate, and low nonwhite racial composition. The coefficient for LOAN*MODNW is 0.0214 with a t-statistic of 1.63, suggesting that the loan program has a stronger impact in integrated areas. This result can be interpreted to mean that $1,000 of loan eligibility raises the sale price by 2.14 percent. With a median house price of $73,000 in 1986, a $3,000 loan thus raised prices by $4,687, suggesting that the loan program has large (perhaps implausible) spillover effects. However, the t-statistic of the coefficient falls just below the 90 percent confidence critical value of 1.645. We now turn to sorting out the fixed effect of the program from the impact of the loan value.

Model 9 includes LOANYR to measure any shift in appreciation coinciding with initiation of the FFSH. The estimated coefficient is 0.0372 with a t-statistic of 1.27, suggesting no significant overall shift. Interacting LOANYR with the racial composition dummies in Model 10, however, reveals that the initiation of the FFSH had a significant impact on house price appreciation in the moderately nonwhite areas, where prices rose 5.8

percent above trend. The coefficient for LOANYR*MODNW is 0.0582 with a t-statistic of 2.25. This result is consistent with the significant increase in the probability of white purchases in the same areas noted in section 4.

Finally, I distinguish the fixed effect of the FFSH on appreciation from the financial effect of the loan amounts. To do this, I enter both the LOAN* and the LOANYR* variables in Model 11. The coefficients for LOAN* are all insignificant. The coefficient for LOANYR*MODNW, however, is 0.0471 with a t-statistic of 1.59. Although this figure is just below the 90 percent critical value, I interpret these results to mean that the fixed effect of the FFSH had a significant impact on house price appreciation that dominated the financial effect of the loan amounts. The program was effective on integrated streets with a nonwhite composition between 30 and 70 percent, but no significant impact was seen in low- (0-30 percent) or high- (70-100 percent) minority areas.

6. Conclusion

This paper estimates the impact of race-based housing subsidies on racial composition and housing prices within the Lomond area of Shaker Heights. Before the FFSH was established in May 1986, Lomond was undergoing significant racial change. Results of this study suggest that the loan program has had a stabilizing effect on the neighborhood's racial composition, particularly on streets with fewer than 70% nonwhite residents.

Prior to May 1986, housing prices in Lomond had lagged those of surrounding communities. Upon initiation of the FFSH, however, prices

increased significantly in areas with a 30-70 percent nonwhite population. The results further suggest that the direct fixed effect of initiating the program dominated any financial effect of capitalizing loans of relatively small present value. In sum, prointegrative subsidies in integrated neighborhoods can directly affect racial composition and appear to have important spillover effects (potentially related to expectations of future racial composition) that raise housing prices.

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Appendix A
Parameter Estimates For Quality Measures[a]

	(4)	(5)	Fixed Effects Omitted (6)
AGE OF HOUSE - LOG	-0.1586	-0.1593	-0.1943
	(0.0062)	(0.0062)	(0.0063)
LOG LIVING AREA SQF	0.2756	0.2754	0.2741
	(0.0106)	(0.0106)	(0.0112)
LOG FRONTAGE LOT	0.0635	0.0632	0.0583
	(0.0092)	(0.0092)	(0.0098)
LOG LOT SIZE	0.1073	0.1072	0.1598
	(0.0061)	(0.0061)	(0.0062)
GARAGE CAPACITY	0.0473	0.0474	0.0582
	(0.0030)	(0.0030)	(0.0032)
GARAGE SIZE SQF (1000'S)	-0.0002	-0.0002	-0.0004
	(0.0005)	(0.0005)	(0.0006)
NUMBER OF ROOMS	0.0068	0.0068	-0.0023
	(0.0019)	(0.0019)	(0.0020)
NUMBER OF BEDROOMS	0.0014	0.0012	0.0008
	(0.0029)	(0.0029)	(0.0031)
NUMBER OF FULL BATHS	0.0131	0.0135	0.0344
	(0.0091)	(0.0091)	(0.0097)
NUMBER OF HALF BATHS	0.0074	0.0077	0.0364
	(0.0062)	(0.0062)	(0.0065)
PLUMBING FIXTURES	0.0145	0.0143	0.0117
	(0.0028)	(0.0028)	(0.0030)
FIREPLACES	0.0217	0.0217	0.0347
	(0.0029)	(0.0029)	(0.0031)
BSMNT SIZE SQF (1000'S)	0.0469	0.0469	0.0534
	(0.0079)	(0.0079)	(0.0085)
FNSHD BSMNT SQF (1000'S)	0.0428	0.0430	0.0531
	(0.0075)	(0.0075)	(0.0079)
NUMBER OF PORCHES	-0.0044	-0.0043	-0.0075
	(0.0025)	(0.0025)	(0.0026)
TERRACED DECK SQF (1000'S)	0.0787	0.0793	0.1281
	(0.0219)	(0.0219)	(0.0235)

Appendix A (cont.)
Parameter Estimates For Quality Measures[a]

	(4)	(5)	Fixed Effects Omitted (6)
OPEN PORCH SQF (1000'S)	-0.0155	-0.0154	-0.0392
	(0.0108)	(0.0108)	(0.0116)
ENCLOSED PORCH SQF (1000'S)	0.0466	0.0465	0.0052
	(0.0265)	(0.0265)	(0.0285)
BAD VIEW	-0.0171	-0.0174	0.0055
	(0.0139)	(0.0139)	(0.0147)
GOOD VIEW	0.0410	0.0414	-0.0618
	(0.0188)	(0.0188)	(0.0163)
GREAT VIEW	0.3152	0.3142	0.2154
	(0.0637)	(0.0637)	(0.0685)
TRIANGLE LOT	0.0113	0.0118	0.0031
	(0.0452)	(0.0452)	(0.0488)
TRAPEZOID LOT	0.0032	0.0030	0.0021
	(0.0103)	(0.0103)	(0.0110)
PARALLELOGRAM LOT	0.0170	0.0170	0.0624
	(0.0265)	(0.0265)	(0.0285)
IRREGULAR LOT	-0.0032	-0.0037	-0.0130
	(0.0055)	(0.0055)	(0.0058)
ROLLING LOT	-0.0246	-0.0246	-0.0080
	(0.0143)	(0.0143)	(0.0148)
HI/LEVEL LOT	0.0040	0.0035	0.0091
	(0.0190)	(0.0190)	(0.0202)
HI/SLOPING LOT	-0.0259	-0.0259	-0.0160
	(0.0414)	(0.0414)	(0.0444)
LIMITED TRAFFIC	-0.0225	-0.0225	-0.0351
	(0.0145)	(0.0145)	(0.0156)
MOD/HEAVY TRAFFIC	-0.0738	-0.0736	-0.0747
	(0.0067)	(0.0067)	(0.0071)
EXT/HEAVY TRAFFIC	-0.0448	-0.0450	-0.0351
	(0.0192)	(0.0192)	(0.0204)
SIDEWALK	-0.0075	-0.0076	0.0170
	(0.0094)	(0.0094)	(0.0097)

Appendix A (cont.)
Parameter Estimates For Quality Measures[a]

	(4)	(5)	Fixed Effects Omitted (6)
RANCH	-0.0220	-0.0218	-0.0493
	(0.0086)	(0.0086)	(0.0089)
BUNGALOW	-0.0424	-0.0424	-0.0583
	(0.0057)	(0.0057)	(0.0060)
SPLIT LEVEL	-0.0757	-0.0756	-0.1306
	(0.0115)	(0.0115)	(0.0120)
BI LEVEL	-0.0407	-0.0413	-0.1281
	(0.0464)	(0.0464)	(0.0500)
CONTEMPORARY	0.0054	0.0056	-0.0653
	(0.0471)	(0.0471)	(0.0507)
CONSTR. GRADE AA	0.3858	0.3856	0.4900
	(0.0204)	(0.0204)	(0.0208)
CONSTR. GRADE A+	0.2708	0.2709	0.3294
	(0.0135)	(0.0135)	(0.0139)
CONSTR. GRADE A	0.1497	0.1498	0.1658
	(0.0134)	(0.0134)	(0.0141)
CONSTR. GRADE B+	0.0884	0.0888	0.1299
	(0.0065)	(0.0065)	(0.0066)
CONSTR. GRADE B	0.0487	0.0486	0.0794
	(0.0052)	(0.0052)	(0.0052)
CONSTR. GRADE C	-0.0343	-0.0345	-0.0550
	(0.0049)	(0.0049)	(0.0048)
CONSTR. GRADE D	-0.2823	-0.2826	-0.3107
	(0.0228)	(0.0228)	(0.0242)
CONDITION BAD	-0.2022	-0.2016	-0.3796
	(0.0104)	(0.0104)	(0.0086)
CONDITION FAIR	-0.0674	-0.0664	-0.1166
	(0.0062)	(0.0063)	(0.0060)
CONDITION GOOD	0.0263	0.0261	0.0224
	(0.0041)	(0.0041)	(0.0042)
CONDITION EXCELLENT	0.0805	0.0803	0.0554
	(0.0119)	(0.0119)	(0.0116)

Appendix A (cont.)
Parameter Estimates For Quality Measures[a]

	(4)	(5)	Fixed Effects Omitted (6)
EXT. WALLS ALUMINUM	0.0254	0.0253	0.0132
	(0.0039)	(0.0039)	(0.0041)
EXT. WALLS BRICK	0.0412	0.0413	0.0375
	(0.0043)	(0.0043)	(0.0046)
EXT. WALLS FRAME/BRICK	0.0127	0.0128	0.0184
	(0.0097)	(0.0097)	(0.0104)
EXT. WALLS STUCCO	0.0255	0.0257	0.0276
	(0.0196)	(0.0196)	(0.0211)
EXT. WALLS BRICK/STUCCO	0.0526	0.0519	0.0415
	(0.0223)	(0.0223)	(0.0240)
EXT. WALLS COMPOSITE/SIDING	-0.1770	-0.1778	-0.2272
	(0.0439)	(0.0438)	(0.0470)
EXT. WALLS ASBESTOS/SIDING	-0.0507	-0.0508	-0.0659
	(0.0122)	(0.0122)	(0.0131)
EXT. WALLS STONE	0.0714	0.0713	0.0244
	(0.0399)	(0.0399)	(0.0430)
EXT. WALLS CONCRETE BLOCK	-0.0025	-0.0018	-0.0391
	(0.0672)	(0.0672)	(0.0724)
HIP ROOF STYLE	0.0120	0.0119	0.0079
	(0.0055)	(0.0055)	(0.0059)
GAMBREL ROOF STYLE	-0.0231	-0.0234	-0.0363
	(0.0147)	(0.0147)	(0.0158)
MANSARD ROOF STYLE	0.0808	0.0804	0.1019
	(0.0358)	(0.0358)	(0.0387)
FLAT ROOF STYLE	-0.0178	-0.0182	0.0175
	(0.0339)	(0.0338)	(0.0364)
SLATE ROOF	0.0330	0.0332	0.0243
	(0.0058)	(0.0058)	(0.0060)
TILE ROOF	0.0132	0.0134	0.0113
	(0.0130)	(0.0130)	(0.0137)
WOOD SHAKE ROOF	0.0649	0.0660	0.1074
	(0.0113)	(0.0113)	(0.0119)

Appendix A (cont.)
Parameter Estimates For Quality Measures[a]

	(4)	(5)	Fixed Effects Omitted (6)
COMPOSITION ROOF	0.0046	0.0044	-0.0607
	(0.0284)	(0.0284)	(0.0306)
METAL ROOF	0.0363	0.0336	0.0279
	(0.1081)	(0.1081)	(0.1167)
HARDWOOD 1ST FLOOR	0.0329	0.0329	0.0423
	(0.0073)	(0.0073)	(0.0076)
HARDWOOD 2ND FLOOR	0.0027	0.0032	-0.0054
	(0.0043)	(0.0043)	(0.0044)
PANELING 1ST FLOOR	-0.1143	-0.1136	-0.1056
	(0.0419)	(0.0419)	(0.0451)
PANELING 2ND FLOOR	-0.0065	-0.0068	-0.0002
	(0.0128)	(0.0128)	(0.0136)
FINISHED ATTIC	-0.0051	-0.0051	0.0154
	(0.0043)	(0.0043)	(0.0045)
STEAM HEAT	0.0408	0.0405	0.0404
	(0.0063)	(0.0063)	(0.0065)
HEAT PUMP	-0.0102	-0.0104	-0.0128
	(0.0238)	(0.0237)	(0.0254)
AIR CONDITIONING	0.0309	0.0306	0.0438
	(0.0048)	(0.0048)	(0.0050)
SLAB CONSTRUCTION/NO BSMNT	-0.0522	-0.0520	-0.0421
	(0.0118)	(0.0118)	(0.0125)
CRAWL SPACE/NO BSMNT	-0.0599	-0.0601	-0.0435
	(0.0183)	(0.0183)	(0.0183)
ATTACHED GARAGE	0.0401	0.0402	0.0495
	(0.0049)	(0.0049)	(0.0050)
SWIMMING POOL	0.0460	0.0463	0.0245
	(0.0188)	(0.0188)	(0.0203)

a. Estimated coefficients (standard errors).

Source: Author's calculations.

Table 1
Median House Prices ($), 1976-89

Year	Eastern Cuyahoga County	Other Shaker	Lomond
1976	37,700	57,250	42,000
1977	38,200	68,000	48,250
1978	44,500	79,900	55,500
1979	49,000	82,500	63,900
1980	50,500	88,000	65,500
1981	53,900	102,000	66,500
1982	52,800	100,000	67,950
1983	54,900	103,750	66,750
1984	55,550	100,000	69,500
1985	57,000	99,000	67,500
1986	60,000	115,000	73,000
1987	60,000	120,000	73,950
1988	62,400	131,000	79,900
1989	64,900	140,000	80,000

Source: Cuyahoga County Recorder's Office.

Table 2
Racial Composition of Lomond Sales

Year	Percent of Sales To Whites	To Blacks
1980	65	35
1981	81	19
1982	NA	NA
1983	70	30
1984	50	50
1985	47	53
1986	56	44
1987	58	42
1988	70	30
1989	59	41
Total	60	40

Source: Shaker Heights Housing Office.

Table 3
Independent Variables, Quality Measures

Variable	Sum[a]	Mean	Std. Dev.
AGE OF HOME		49.052	17.025
LIVING AREA SQF		1640.074	719.801
FRONT FOOTAGE FT		55.650	27.537
LOT SIZE SQF		8804.725	7489.093
NUMBER OF ROOMS		6.720	1.729
NUMBER OF BEDROOMS		3.239	0.895
NUMBER OF BATHROOMS		1.323	0.634
NUMBER OF HALF BATHS		0.518	0.583
PLUMBING FIXTURES		7.232	2.624
GARAGE CAPACITY		1.636	0.601
GARAGE SIZE SQF		3920.159	2961.836
NUMBER OF PORCHES		0.895	0.820
TERRACED DECK SQF		21.171	76.570
OPEN PORCH SQF		74.874	74.874
ENCLOSED PORCH SQF		29.010	64.280
BASEMENT SIZE SQF		838.287	397.186
FINISHED BASEMENT SQF		148.887	246.054
NUMBER OF FIREPLACES		0.502	0.633
BAD VIEW	348	0.013	0.115
GOOD VIEW	566	0.022	0.146
GREAT VIEW	15	0.001	0.024
TRIANGLE LOT	29	0.001	0.033
TRAPEZOID LOT	585	0.022	0.148
PARALLELOGRAM LOT	85	0.003	0.057
IRREGULAR LOT	2,580	0.099	0.298
ROLLING LOT	318	0.012	0.110
HI/LEVEL LOT	170	0.006	0.080
HI/SLOPING LOT	35	0.001	0.037
LIMITED TRAFFIC	304	0.012	0.107
MOD/HEAVY TRAFFIC	1,546	0.059	0.236
EXT/HEAVY TRAFFIC	179	0.007	0.082
SIDEWALK	25,287	0.966	0.180
RANCH	2,671	0.102	0.303
BUNGALOW	6,716	0.257	0.437
SPLIT LEVEL	775	0.030	0.170
BI LEVEL	28	0.001	0.033
CONTEMPORARY	28	0.001	0.033
CONSTRUCTION GRADE AA	424	0.016	0.126
CONSTRUCTION GRADE A+	820	0.031	0.174
CONSTRUCTION GRADE A	510	0.019	0.138
CONSTRUCTION GRADE B+	3,809	0.146	0.353
CONSTRUCTION GRADE B	5,180	0.198	0.399

Table 3 (Cont.)

Variable	Sum[a]	Mean	Std. Dev.
CONSTRUCTION GRADE C	4,916	0.188	0.391
CONSTRUCTION GRADE D	127	0.005	0.070
CONDITION BAD	1,388	0.053	0.224
CONDITION FAIR	2,721	0.104	0.305
CONDITION GOOD	6,948	0.266	0.442
CONDITION EXCELLENT	664	0.025	0.157
EXT. WALLS ALUMINUM	7,360	0.281	0.450
EXT. WALLS BRICK	6,007	0.230	0.421
EXT. WALLS FRAME/BRICK	691	0.026	0.160
EXT. WALLS STUCCO	162	0.006	0.078
EXT. WALLS BRICK/STUCCO	125	0.005	0.069
EXT. WALLS COMPOSITE/SIDING	31	0.001	0.034
EXT. WALLS ASBESTOS/SIDING	424	0.016	0.126
EXT. WALLS STONE	38	0.001	0.038
EXT. WALLS CONCRETE BLOCK	13	0.000	0.022
HIP ROOF STYLE	2,648	0.101	0.302
GAMBREL ROOF STYLE	281	0.011	0.103
MANSARD ROOF STYLE	46	0.002	0.042
FLAT ROOF STYLE	63	0.002	0.049
SLATE ROOF	2,828	0.108	0.311
TILE ROOF	396	0.015	0.122
WOOD SHAKE ROOF	545	0.021	0.143
COMPOSITE ROOF	87	0.003	0.058
METAL ROOF	5	0.001	0.014
HARDWOOD 1ST FLOOR	24,553	0.938	0.241
HARDWOOD 2ND FLOOR	15,225	0.582	0.493
PANELING 1ST FLOOR	34	0.001	0.036
PANELING 2ND FLOOR	389	0.015	0.121
FINISHED ATTIC	7,796	0.298	0.457
STEAM HEAT	2,949	0.113	0.316
HEAT PUMP	117	0.004	0.067
AIRCONDITION	4,490	0.172	0.377
SLAB CONSTRUCTION/NO BASEMENT	1,187	0.045	0.208
CRAWL SPACE/NO BASEMENT	280	0.011	0.103
ATTACHED GARAGE	7,898	0.302	0.459
SWIMMING POOL	174	0.007	0.081

a. Reported for 0/1 dummy variables. Total number of observations equals 26,166. Omitted characteristics include NORMAL VIEW, REGULAR LOT, NORMAL TRAFFIC, COLONIAL STYLE, CONSTRUCTION GRADE C+, CONDITION NORMAL, EXT. WALLS FRAME, PITCH ROOF STYLE, AND ASPHALT SHINGLE ROOF.

Source: Cuyahoga County property tax records.

Table 4
Logit Model Estimates: Probability of White Buyer/Seller in Lomond[a]

	Dependent Var.=1 if Sold by White	Dependent Var.=1 if Bought by White	
	(1)	(2)	(3)
NONWHITE%10-20	2.6917	3.0102	3.0847
	(1.1213)	(0.8739)	(1.0110)
NONWHITE%20-30	1.7557	2.9112	2.8397
	(0.7574)	(0.8054)	(0.9887)
NONWHITE%30-40	1.7549	2.8197	2.9824
	(0.5515)	(0.6470)	(0.8312)
NONWHITE%40-50	1.6504	2.1909	2.3623
	(0.4857)	(0.6039)	(0.7976)
NONWHITE%50-60	1.4510	2.0134	2.1964
	(0.4995)	(0.6077)	(0.8170)
NONWHITE%60-70	1.3928	1.6269	1.8128
	(0.5430)	(0.6348)	(0.8321)
NONWHITE%70-80	0.8629	0.9558	1.0020
	(0.6500)	(0.7739)	(0.7828)
LOANYR	...	0.4080	...
	...	(0.1624)	...
LOANYR*HIGHNW	...	...	0.4524
(70-100% nonwhite)	...	...	(0.2696)
LOANYR*MODNW	...	...	0.3578
(30-70% nonwhite)	...	...	(0.1597)
LOANYR*LOWNW	...	...	0.7029
(0-30% nonwhite)	...	...	(0.4771)
LOMONDYR	-0.0157	-0.1693	-0.1587
(1980=0,...,1989=9)	(0.0500)	(0.0835)	(0.0799)
INTERCEPT	-0.1517	-1.4065	-1.5628
	(0.4938)	(0.6217)	(0.8051)
No. of Observations	317	317	317
No. of Dependent Var.=1	242	178	178
No. of Dependent Var.=0	75	139	139
Model Chi-squared	19.87	39.76	37.51

a. Estimated coefficients (standard errors).

Note: NONWHITE%80-90 is the omitted category. LOANYR is the age of the loan program and equals 0 before 1986, equals 1 in 1986,..., equals 4 in 1989. HIGHNW=1 if street is 70-100% nonwhite. MODNW=1 if street is 30-70% nonwhite. LOWNW=1 if street is 0-30% nonwhite.

Source: Author's calculations.

Table 5
Hedonic House Price Regression: Controlling for
Racial Composition, House Quality, and Neighborhood Fixed Effects[a]

	(4)	(5)	Fixed Effects Omitted (6)
NONWHITE%	...	-0.1574	-0.3372
	...	(0.0594)	(0.0060)
NONWHITE%LOMOND	...	-0.1697	-0.1333
	...	(0.0786)	(0.0850)
LOMOND83	-0.1095	-0.0490	0.0287
	(0.0437)	(0.0576)	(0.0594)
LOMOND84	-0.0408	0.0197	0.0982
	(0.0414)	(0.0559)	(0.0573)
LOMOND85	-0.0852	-0.0148	0.0620
	(0.0343)	(0.0519)	(0.0528)
LOMOND86	-0.0410	0.0256	0.0954
	(0.0372)	(0.0557)	(0.0572)
LOMOND87	0.0467	0.1180	0.1953
	(0.0376)	(0.0567)	(0.0583)
LOMOND88	0.0854	0.1581	0.2273
	(0.0381)	(0.0568)	(0.0585)
LOMOND89	0.1014	0.1758	0.2394
	(0.0401)	(0.0609)	(0.0631)
COUNTY84	0.0256	0.0269	0.0181
	(0.0061)	(0.0062)	(0.0065)
COUNTY85	0.0546	0.0572	0.0558
	(0.0061)	(0.0062)	(0.0064)
COUNTY86	0.1028	0.1067	0.1036
	(0.0059)	(0.0061)	(0.0063)
COUNTY87	0.1379	0.1432	0.1425
	(0.0060)	(0.0063)	(0.0064)

Table 5 (Cont.)
Hedonic House Price Regression: Controlling for
Racial Composition, House Quality, and Neighborhood Fixed Effects[a]

	(4)	(5)	Fixed Effects Omitted (6)
COUNTY88	0.1812	0.1877	0.1887
	(0.0060)	(0.0065)	(0.0063)
COUNTY89	0.2345	0.2423	0.2459
	(0.0061)	(0.0068)	(0.0064)
OTHSHAKER84	0.0819	0.0841	0.1477
	(0.0201)	(0.0201)	(0.0169)
OTHSHAKER85	0.0694	0.0738	0.1423
	(0.0197)	(0.0198)	(0.0165)
OTHSHAKER86	0.1381	0.1444	0.2166
	(0.0186)	(0.0187)	(0.0147)
OTHSHAKER87	0.2302	0.2387	0.3115
	(0.0191)	(0.0194)	(0.0156)
OTHSHAKER88	0.3251	0.3355	0.4129
	(0.0194)	(0.0198)	(0.0159)
OTHSHAKER89	0.4171	0.4294	0.5136
	(0.0200)	(0.0205)	(0.0167)
INTERCEPT	8.1019	8.1260	7.6860
	(0.0813)	(0.0817)	(0.0820)
No. of Observations	26,166	26,166	26,166
Mean Dependent Var.	11.011	11.011	11.011
S.S.E.	1508.96	1508.11	1770.45
S.E.R.	.241	.241	.261
R-squared	.828	.828	.798

a. Estimated coefficients (standard errors).

Note: Parameter estimates for quality measures are reported in appendix A.

Source: Author's calculations.

Table 6
Hedonic Price Regression: Controlling For
Impact of Loan Program[a]

	(7)	(8)	(9)	(10)	(11)
NONWHITE%	-0.1573	-0.1574	-0.1574	-0.1574	-0.1575
	(0.0594)	(0.0594)	(0.0594)	(0.0594)	(0.0594)
NONWHITE%LOMOND	-0.1882	-0.1675	-0.1731	-0.1587	-0.1666
	(0.0793)	(0.0979)	(0.0785)	(0.0948)	(0.0980)
LOMONDYR	0.0222	0.0233	0.0124	0.0008	-0.0022
(1983=0,...,1989=6)	(0.0140)	(0.0142)	(0.0229)	(0.0202)	(0.0208)
LOAN ($1,000)	0.0213	...	...	...	...
	(0.0144)	...	...	...	...
LOAN*HIGHNW	...	0.0099	...	...	0.0071
(70-100% nonwhite)	...	(0.0179)	...	...	(0.0432)
LOAN*MODNW	...	0.0241	...	...	0.0132
(30-70% nonwhite)	...	(0.0148)	...	...	(0.0173)
LOAN*LOWNW	...	-0.0015	...	...	-0.0378
(0-30% nonwhite)	...	(0.0343)	...	...	(0.0821)
LOANYR	...	...	0.0372	...	...
	...	...	(0.0294)	...	...
LOANYR*HIGHNW	...	...	...	0.0391	0.0352
(0-30% nonwhite)	...	...	...	(0.0299)	(0.0621)
LOANYR*MODNW	...	...	...	0.0582	0.0471
(30-70% nonwhite)	...	...	...	(0.0259)	(0.0296)
LOANYR*LOWNW	...	...	...	0.0294	0.0672
(70-100% nonwhite)	...	...	...	(0.0363)	(0.0791)
Observations	26,166	26,166	26,166	26,166	26,166
Mean Dependent Var.	11.0110	11.0110	11.0110	11.0110	11.0110
R-squared	0.8277	0.8277	0.8277	0.8277	0.8277
S.E.R	0.2410	0.2410	0.2410	0.2410	0.2410

a. Estimated coefficients (standard errors).

Note: LOAN = $1,000 of loan eligibility. LOANYR is the age of the loan program and equals 0 before 1986, equals 1 in 1986,..., equals 4 in 1989. HIGHNW=1 if street is 70-100% nonwhite. MODNW=1 if street is 30-70% nonwhite. LOWNW=1 if street is 0-30% nonwhite. Parameter estimates for quality measures and appreciation in COUNTY and OTHSHAKER are contained in an appendix available from the author.

Source: Author's calculations.

Figure 1

SHAKER HEIGHTS CITY SCHOOL DISTRICT

1. **Shaker Heights City Schools**
2. **Boulevard Elementary** K-4
3. **Fernway Elementary** K-4
4. **Lomond Elementary** K-4
5. **Mercer Elementary** K-4
6. **Onaway Elementary** K-4
7. **Woodbury Elementary** 5-6
8. **Shaker Heights Middle School** 7-8
9. **Shaker Heights High School** 9-12

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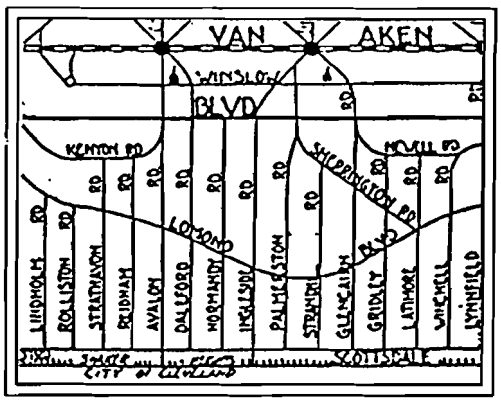
Figure 2

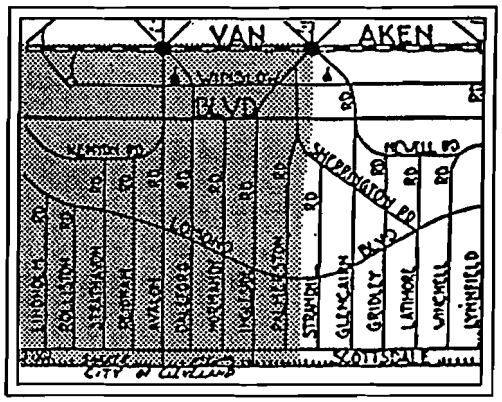
AVAILABILITY OF LOANS IN LOMOND: LOCATION AND AMOUNT

LOMOND NEIGHBORHOOD



May 1, 1986 - December 31, 1986

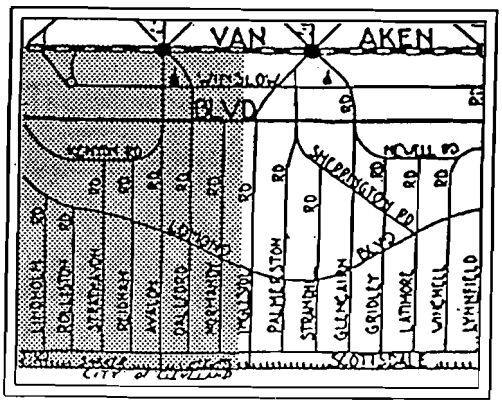
Loan value was $3,000 for the entire Lomond neighborhood.



January 1, 1987 - March 31, 1989

Loan value remained at $3,000 for purchases east of Palmerston Road.

Loan value increased to $4,000 for purchases on Palmerston Road and west (shaded region).

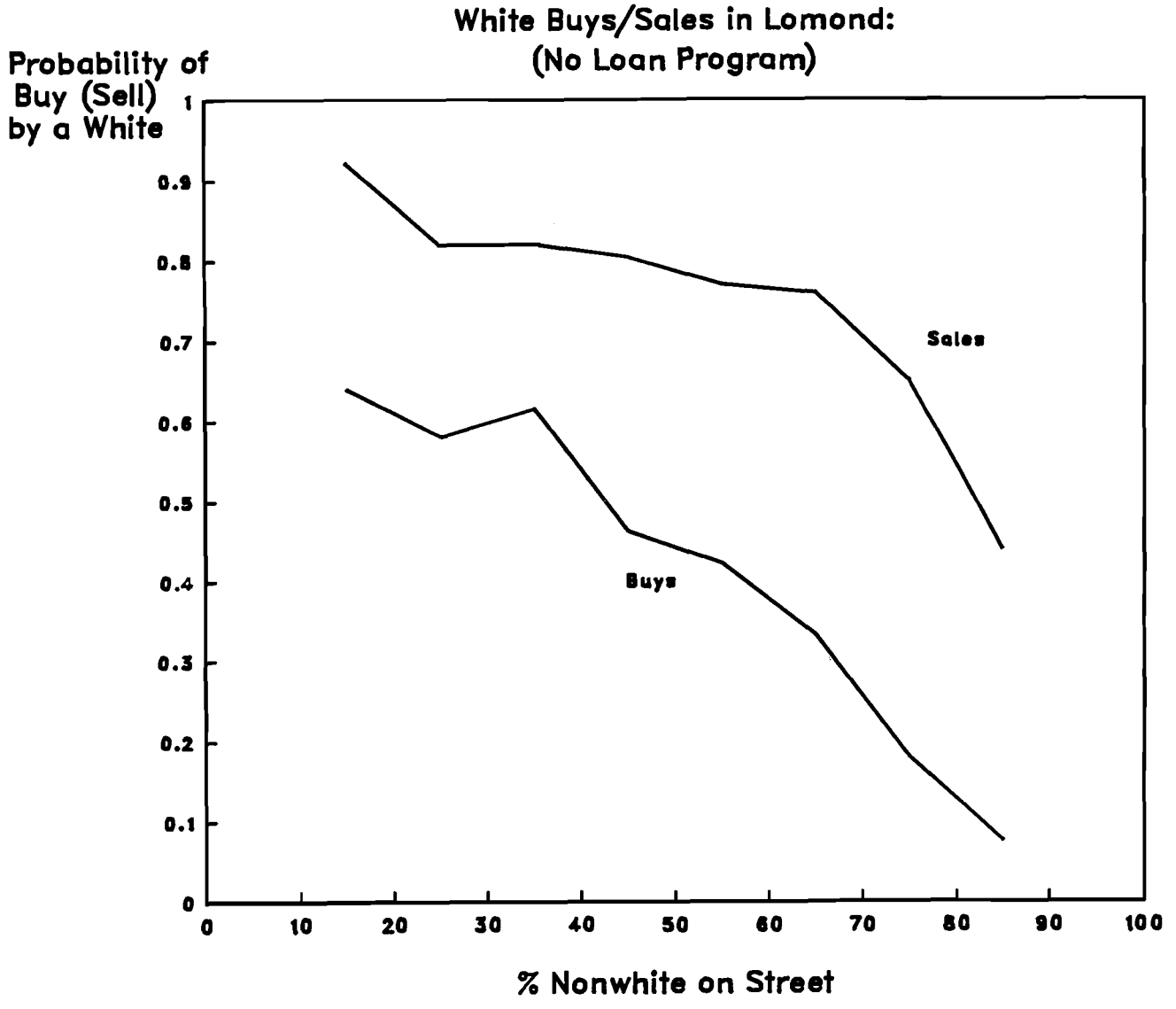


April 1, 1989 - Present

Loan value remained at $3,000 for all purchases east of Normandy Road (boundary moved from Palmerston Road to Normandy Road).

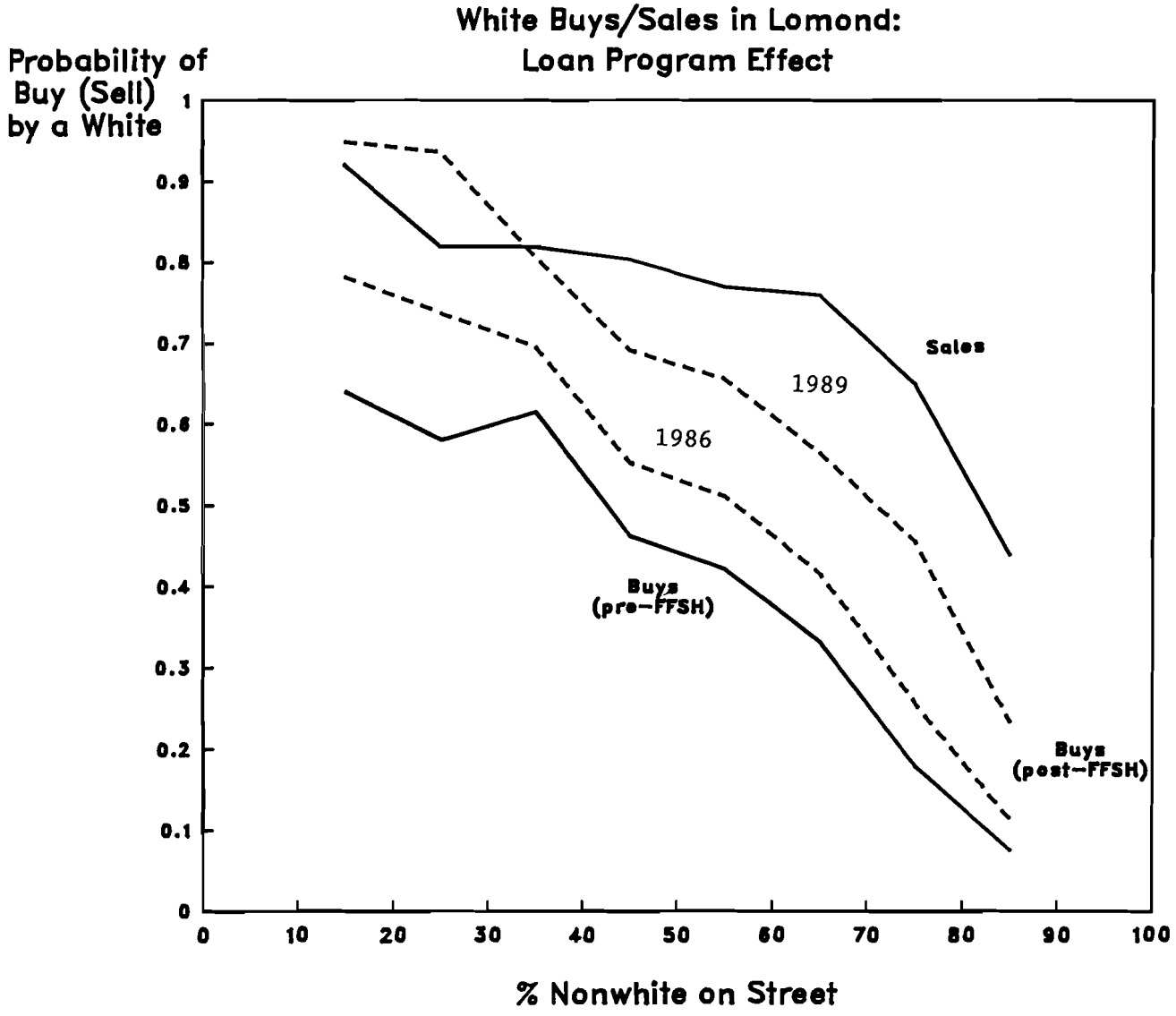
Loan value increased to $5,000 for purchases on Normandy Road and west (shaded region).

Figure 3



Source: Author's calculations.

Figure 4



Source: Author's calculations.