Have the doors opened wider?
Trends in homeownership rates by race and income [1]

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Abstract: Homeownership among U.S. families increased notably in recent years, from 63.9% in 1989 to 66.2% in 1998. This paper examines this trend and the factors contributing to it. We find that (1) homeownership has risen for all racial, ethnic, and income groups, (2) the differences in homeownership between minority and non-minority families and between middle-income and lower-income families declined significantly, and (3) changes in family-related characteristics explain homeownership trends among only the top two income quintiles. Among the lower two income quintiles, family-related characteristics explain almost none of the increase in homeownership. This pattern of results suggests that the favorable economic climate during the last decade, changes in mortgage and housing markets, and changes in the regulations that govern those markets account for the increase in homeownership among lower-income families.

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Homeownership has long been viewed as an important milestone for families, and an important contributor to economically vibrant communities. Efforts to foster homeownership have been widespread among both public and private organizations, and buying a home consistently ranks among the top reasons for saving (among renters) in national surveys. It is not surprising, then, that the majority of U.S. families own their primary residence. Moreover, in recent years the percentage of families who own their home has risen substantially — from 63.9 percent in 1989 to 66.2 percent in 1998. Though small in percentage terms, these statistics imply that an additional 8 million families have acquired a home in just the last decade. This paper's main objectives are to identify the types of families driving these trends, and to identify the factors contributing to their increased rates of homeownership.

Part of the growth in homeownership is undeniably due to the booming U.S. economy. After falling during the 1991 recession, labor force participation, employment, and real incomes all have risen above their 1989 levels, and throughout this period mortgage interest rates have remained near historic lows. On the other hand, such aggregate statistics ignore potentially important distributional factors. Economic circumstances may not have improved for all groups, or for all groups equally, possibly masking disparities in homeownership trends and confounding a straightforward determination of the role of economic circumstances in explaining them.

Aside from cyclical economic forces, changes in the mortgage market itself are likely to have influenced the trends in homeownership. For example, the last decade has seen significant innovation among mortgage lenders, including technological and information-based advances that have improved their ability to assess risk, tailor products to particular population segments, and develop new products. Such developments may have made it easier for families to qualify for a mortgage and to purchase a home.

Finally, developments in the regulatory environment may have played a role in raising the percentage of families who own their homes. It has long been suspected that some groups — primarily ethnic minorities and lower-income households — have not had the same access to mortgage credit as others, possibly limiting their ability to become homeowners. In response to such concerns, the Congress passed a series of acts, including the Home Mortgage Disclosure Act (HMDA), the Community Reinvestment Act (CRA), and other fair lending regulations, designed

to ensure that groups who previously had relatively low homeownership rates received access to mortgages more in line with the quality of their credit. In recent years, revisions to these Acts and implementing regulations have increased the level of scrutiny associated with their enforcement. The Congress also authorized the Department of Housing and Urban Development to establish affordable housing goals for Fannie Mae and Freddie Mac, with the objective of increasing liquidity for lending to lower-income communities. The goals have become a benchmark against which the performance of Fannie Mae and Freddie Mac has been evaluated. This increased scrutiny has likely influenced lender behavior and may have contributed to the increase in homeownership.

This paper seeks to measure the extent to which homeownership has changed among U.S. households, an objective we pursue in three stages. First, we examine trends in average homeownership rates. Because of the special role of race, ethnicity, and income in the regulations that govern mortgage market participants, we focus on trend differences by race and income. We examine whether average homeownership rates have risen in an absolute sense, and whether the differential in homeownership rates across racial and income groups has declined. Because differences in homeownership rates among different groups may be partially explained by differences in average family-related characteristics, such as income, the second stage of the analysis examines whether trend differences persist in a multivariate setting, asking: Controlling for family-related characteristics, has the disparity in homeownership between black and white families shrunk over time? Our third and final objective is to determine the factors that explain the changes in homeownership. That is, we are interested in explaining how large a role (i) changes in family-related characteristics, such as improved economic circumstances and (ii) changes in other characteristics, such as those in credit markets and the regulatory environment, played in producing the observed growth in homeownership. These objectives, particularly the third, pose significant conceptual and practical challenges. It should be noted at the outset that results from this analysis, while suggestive, do not definitively answer these questions.

To address these questions, this paper examines trends in homeownership between 1989 and 1998 using the Current Population Survey (CPS). The analysis reveals that homeownership rates rose between 1989 and 1998 — both in the aggregate and for families in all racial and

income groups examined. The racial disparity in homeownership shrank significantly during this period, though it remains substantial; the disparity measured about 26 percentage points in 1998, compared to about 28 percentage points in 1989. The decline in the disparity remains even after controlling for family demographic and financial characteristics. Regarding the role of changes in family circumstances over the 1989-1998 period, such factors appear to account for a relatively small part of the increase in homeownership among lower-income families, but account for a substantial part of the increase in homeownership for upper-income families. We conclude from this pattern that a substantial part of the increase is attributable to changes in the ways mortgage markets function. Overall, such results are consistent with the hypothesis that consumer regulation has had important impacts on mortgage lending patterns. However, we cannot reject the hypothesis that other changes in the market, such as the very lower mortgage interest rates that have prevailed recently and technological developments, have been at least as influential as regulatory developments, if not more so, in driving observed trends.

I. Changes in Homeownership Rates -- Recent Findings

The question of whether relative rates of homeownership have changed over time has been of interest to many previous researchers, often in the context of racial differences in wealth. For example, Blau and Graham (1990) found large racial differences in wealth among young families in 1976 and 1978 that remained after controlling for income and other characteristics. The authors analyzed racial differences in home equity as a potential explanation for these differences, but only obtain mixed results on this matter.

Using the Census of Population and Housing and the CPS, Long and Caudill (1992) examine racial differences in homeownership directly and study trends from 1970 to 1986. The authors find relatively large gains made by black husband and wife households and that these gains arose mainly from factors *other* than the reduction of differences in economic and other characteristics. They take this as evidence that the relative increase in homeownership rates among blacks has been primarily the result of reductions in discrimination in the housing acquisition process.

Trends in homeownership between 1977 and 1997 are studied in Segal and Sullivan (1997) using the CPS. The focus of this research is on how changes in various characteristics

have contributed to observed changes in homeownership over the period. As part of their analysis, they examine racial differences in homeownership and, like Long and Caudill (1992), find that less than half of the differences and a small fraction of the trends can be explained by differences and trends in observable characteristics among white and black households.

Collins and Margo (1999) conducts perhaps the most expansive examination of this topic to date by exploring the trend in comparative homeownership rates between 1900 and 1990. Using Census data, they find that the effect of race has declined since 1900 and that nearly all of the decline has occurred since 1960. As with the other studies, only a fraction of the differences in homeownership rates could be explained by differences in observable factors thought to influence homeownership, such as income and education.

The current analysis builds on this literature and enhances it in several ways. Perhaps the most significant feature of this analysis is its focus on racial trends in homeownership rates among families grouped by income level. This is potentially important for several reasons. First, homeownership processes may differ by income level. For example, the weight that lenders attach to characteristics such as wealth and employment history may vary with the income level of the family applying for a mortgage. Estimating separate relationships by income group may more closely simulate how the marketplace actually functions, which could allow for more meaningful inferences to be drawn. Second, many of the government policies that are often of interest to researchers often target families according to their income level. If relative racial trends in homeownership differ by income level, the observed differences may have clear implications for the effectiveness of specific policies. This should allow for more refined inferences regarding how public policy has influenced homeownership rates than has been previously possible.

A second important feature of this analysis is the time period chosen. This paper examines trends in homeownership between 1989 and 1998. Aside from the benefit of analyzing a more recent time period than previous studies, this choice affords two other benefits. First, it allows the analysis to avoid many issues related to the business cycle. Because both 1989 and 1998 were at least 7 years into broad economic expansions, trends between these years can not be viewed as simply a by-product of general economic well-being. In this sense, the analysis compares apples to apples. Secondly, as discussed below, the regulatory environment changed in key ways in

1990. By beginning the analysis in 1989, we avoid having to make adjustments to account for this regulatory regime change.

In addition, previous empirical analyses have not included the price of housing, a factor which certainly influences affordability of homes and, by extension, the homeownership rate. The omission of housing prices by previous researchers may account for the small amount of the trends they are able to explain. Our addition of a measure of housing prices to the typical empirical specifications used in the literature may provide a more complete characterization of how changes in observable factors have driven recent homeownership trends.

II. Changes in Homeownership Rates -- Current Evidence

The primary data used for the analysis is drawn from the 1989 and 1998 March supplements to the CPS, a geographically-based random sample designed primarily to describe the income, employment, and demographic characteristics of the U.S. population. These data contain detailed information on over 50,000 families in each year, including race and ethnicity indicators, income, family characteristics, and whether or not the family owns its residence. We include in the analysis only primary families whose heads were between the ages 22 and 60 at the time of the interview.[2] Our 1989 and 1998 samples, respectively, consist of 38,964 and 36,248 families.

The CPS data allow us to overcome one of the main challenges to investigating differences in trends in homeownership: precision. With its large sample of minority and lower-income families, the CPS produces relatively precise estimates of trends in racial, ethnic, and income disparities in homeownership, in spite of the relatively modest — but economically significant — percentage increases in homeownership observed over the analysis period.

We focus on the 1989 and 1998 surveys for two reasons: First, both surveys were conducted after approximately 7 consecutive years of economic growth, making them comparable along at least one important cyclical economic dimension. A second advantage to using this period is that two prominent fair lending laws — the Community Reinvestment Act (CRA) and

[2] The term "family" used here and throughout refers to the primary family — including single people — listed for each household record in the CPS. If there are multiple families within a household, the CPS designates the householder as the primary family. In this paper, family is synonymous with householder. For consistency across observations, person-specific characteristics are taken from the male for married or partnered couples.

the Home Mortgage Disclosure Act (HMDA) — were refocused in 1990 in ways that increased the level of scrutiny associated with their enforcement. Hence, the 1989 and 1998 samples provide snapshots of homeownership before and after important regulatory changes that may have affected homeownership.

According to these data, between 1989 and 1998 homeownership among U.S. families rose from 60.6 percent in 1989 to 62.6 percent in 1998 (table 1). Homeownership rises strongly with income in both years.[3] Homeownership rates were higher in 1998 than 1989 for families in each quintile of the income distribution, though the amount of increase differed notably across groups.[4] Homeownership rates among families in the bottom and top income quintiles increased by about one percentage point, while homeownership rates in the middle-income quintiles increased by 2 to 3 percentage points over this period.

Homeownership increased for all racial groups between 1989 and 1998 as well. Homeownership rates among black families rose by 4.7 percentage points, from 37.7 percent to 42.4 percent between 1989 and 1998. Hispanic families saw a 3.7 percentage point increase, from 39.4 percent to 43.1 percent over the same period.[5] The increase among white families was smaller, resulting in a narrowing of the disparity in homeownership between minority and non-minority families. In other words, both absolute and relative homeownership rose for black and Hispanic families over the 1989-1998 period.[6] However, the homeownership rate for white families, at 69.2 percent in 1998, remains more than fifty percent higher than that of minorities.[7]

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[3] The March 1989 and March 1998 CPS collect family income during calendar years 1988 and 1997, respectively. These dollar figures (and all others presented here) are adjusted to 1998 dollars using the all-item urban "current-methods" version of the Consumer Price Index (CPI).

[4] We examine income quintiles to accommodate the widening distribution of real income over the analysis period. This approach allows for across-time comparisons based on income to hold constant families' economic positions relative to other families in the same year.

[5] Hispanic families are those of any race that identified their ethnicity as Hispanic. Black and white families are mutually exclusive from Hispanic families.

[6] The discussion focuses on blacks and Hispanics. Trends among families headed by Asians, Native Americans, and members of other ethnic or racial groups are not addressed because of the relatively small number of these types of families in the data.

[7] Segal and Sullivan (1998) report broadly similar trends over the 1989-1997 period in their analysis of homeownership.

These trends can be viewed as supporting several different hypotheses about why homeownership has changed. On one hand, they suggest that the combined effects of regulatory, credit market, and housing market changes have resulted in increased homeownership among lower-income and minority families. On the other hand, the declining disparity may reflect trends in the economic or demographic circumstances, which we group collectively as "family-related characteristics," among minority and non-minority families, and among lower-income and middle-income families. An important goal of this paper is to identify the role of family-related characteristics in explaining homeownership in order to quantify their importance relative to that of regulatory, credit market, and other housing market changes in explaining homeownership trends.

III. Why Homeownership Rates Have Changed

The decision to own a home is governed by a number of factors, including household circumstances such as the presence of children, the availability and affordability of homes, and the ability to obtain financing for mortgages. Each of these factors has changed over the past decade in ways which could explain the increased rate of homeownership. In discussing these factors, we group them into three broad categories — family-related characteristics, credit markets, and the regulatory environment.

Changes in family-related characteristics

Between 1989 and 1998, the *characteristics of families* and their circumstances have changed considerably in ways that may have raised homeownership rates (table 1). Due in part to the aging of the "baby boom" cohort, the average age in our samples rose from 39.6 to 41.0 years between 1989 and 1998. Education levels have increased across the board, as the share of the population with less than a high school diploma declined by 25 percent and the share with at least some college rose about 21 percent. In addition, the structure of households has continued to change, as the share of female-headed households has increased and the share of married households has declined. Each of these changes could have important effects on homeownership rates.

Another likely important factor influencing homeownership rates was the *favorable economic climate* during the 1990s. For the whole sample considered together, median family

income dipped only slightly from $42,000 to $41,500 between 1989 and 1998. However, the affordability of homeownership was enhanced by mortgage interest rates, which fell to and remained at historical lows during the mid-1990s, and modest depreciation in housing prices over the period. Between 1989 and 1998, housing prices declined in real terms from $128,700 to $122,200.[8] These trends have helped make mortgages and homeownership more affordable to households, particularly the less affluent. Economic growth could also influence decisions to own homes by altering household expectations about future streams of income. If growth spurs optimism, then households could become more inclined to make major purchases, such as homes. On the other hand, if recession concerns increase as the expansion continues, then declines in homeownership are possible.

Shifts in family-related characteristics could have differential impacts on homeownership rates for minority and lower-income populations, as some trends have been more pronounced among these groups. For example, Hispanic families saw their median incomes decline by about $1600, or about 5 percent, and the fraction of Hispanic families in the two lowest income quintiles rose by 1.6 percentage points to about 59.9 percent. In contrast, white and black families enjoyed modest increases in income between 1989 and 1998. The fraction of black families in the two lowest income groups fell from 63.4 to 60.4 percent, and the fraction of white families fell slightly from 34.6 to 33.9 percent. Over the same period, median local housing prices fell in real terms by between $4,000 and $8,000 for white and black families, while dropping by $31,000 for Hispanic families. Together, trends in income and housing prices indicate that the affordability of housing may have changed to different degrees among racial and ethnic groups. It will be important to examine the extent to which such factors explain differences in homeownership trends.

Changes in credit markets

Over the past 20 years, the structure of the banking industry has changed substantially, as technology, consolidation, and other factors have influenced the organization and operation of

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[8] The housing price figures are average housing prices within each family's MSA (hereafter, "local housing prices"), calculated by the U.S. Department of Housing and Urban Development (HUD) for 1989 and 1997 (the most recent year for which data are available). For families who do not live in an MSA, and families living in an unidentified MSA, HUD's average housing price within the state is used. These prices are adjusted to 1998 dollars.

banking and other financial institutions. Each has had important effects on how prospective homeowners are served by mortgage lenders. Such changes may explain part of the increase in homeownership.

Technological developments have changed how mortgage applications are processed and how mortgage loan portfolios are managed. Technology has lowered the cost of extending credit and monitoring portfolios by automating many stages of the lending process. Technology has also allowed lenders to offer products tailored to particular segments of the borrowing population. An important innovation in credit markets generally has been the use of statistical models to expand risk-based pricing, in which loan products are priced according to the riskiness of the borrower. In the mortgage market, one result of the increase in the use risk-based pricing has been the dramatic increase in the amount of subprime lending, which has allowed borrowers with more marginal credit quality to obtain mortgages (at higher interest rates) instead of being shut out of the market, which had historically been the case. In addition, it has become considerably easier for families to obtain mortgages from institutions not physically located close to their residence. The increase in these "remote lending" opportunities has given families more options for obtaining a mortgage. Together, these technological and competitive developments are likely to have increased extensions of mortgages to minorities and to have raised minority homeownership rates.

Perhaps the most important development in this regard has been the increased lender reliance on automated underwriting, also known as credit scoring.[9] Credit scoring offers a number of benefits. First, the likelihood of overt differential treatment based on race is dramatically reduced through the use of credit scoring, since scoring models are by law supposed to exclude racial indicators. In addition, because high quality credits are identified more easily, fewer resources are required to process these applications and more resources can be devoted to more marginal cases. In general, the widespread use of credit scoring should help to increase access to mortgage credit and homeownership among all families.

On the other hand, the use of credit scoring could lead to less attention given to mitigating circumstances that may help explain particular applicant shortcomings. This could disadvantage

[9]For more information on credit scoring, see Avery, Bostic, Calem and Canner (1996).

minorities and lower-income households, who typically have less wealth and less ability to withstand catastrophic events and often must rely on payment histories not typically included on credit reports, such as utility or rent payments, to demonstrate their creditworthiness.

Consolidation has also emerged as an important force in shaping lending markets. Through the 1980s and early 1990s, most restrictions on how and where banking institutions could consolidate were removed.[10] In the wake of this deregulation, the banking industry saw a significant increase in consolidation activity (mergers and acquisitions). Because consolidation can lead to changes in the competitiveness of markets and, on an institutional level, changes in the efficiency of operations, the locus of decision-making (local versus centralized), and potentially the product focus, consolidation could have important effects on mortgage lending patterns. Evidence to date suggests that this may not be the case.

Avery, Bostic, Calem and Canner (1999) examined the relationship between consolidation and mortgage lending and found that the amount of mortgage lending in a market was largely unrelated to the level of consolidation activity. This general result — true for overall lending and for lending to minority and lower-income borrowers and neighborhoods — was observed in spite of the fact that those institutions involved in consolidation reduced their lending substantially in those areas in which they had banking offices. These reductions were offset by expanded lending by banking organizations in areas in which they did not have offices and by independent mortgage companies, finance companies and credit unions.

Changes in regulation

Aside from changes in the marketplace, many believe that discrimination has also had an important influence on the provision of mortgages, which may explain why the disparity between similar minority and non-minority homeownership rates persists. This has been the source of a heated and on-going debate, as there are others who do not believe that discrimination plays a

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[10]Restrictions against interstate banking began to be loosened in 1979, and since then every state except Hawaii has reduced restrictions on ownership of in-state banks by out-of-state banking institutions. The Congress passed the Riegle-Neal Act in 1994, which effectively eliminated interstate banking restrictions. A similar progression was observed for thrifts, as restrictions on interstate acquisitions of savings associations were relaxed in 1986 by the Federal Home Loan Bank Board and were ultimately removed in 1992 by the Office of Thrift Supervision.

significant role in financial service markets. The different perspectives are presented in two recently released reports on discrimination in mortgage markets, one by the Urban Institute (The Urban Institute, 1999) and one by economics professor George Benston (Benston, 1999), and so are not reviewed here.

This debate aside, legislation was enacted to address perceived inequities arising from alleged illegal discrimination in the marketplace. The Community Reinvestment Act (CRA), the Home Mortgage Disclosure Act (HMDA), and several fair lending laws were designed to change the way mortgage markets functioned, and ultimately to promote more equitable treatment of minority and lower-income households. In recent years, revisions of these Acts have increased the level of scrutiny associated with their enforcement. For example, revisions to HMDA led to the collection of detailed data on the disposition of all home mortgage applications received by lenders. These allowed for more detailed statistical analyses of lender activities that were previously not possible. Similarly, clarifications of the circumstances under which potential violations of Regulation B, which implements the Equal Credit Opportunity Act (ECOA), led to increased scrutiny.

These Acts, particularly their most recent revisions, have influenced the functioning of mortgage markets and may have increased access to mortgage credit for lower-income and minority families, and other groups believed to have been historically underserved. For example, in response to CRA, many lenders have introduced a variety of new mortgage products, often under "affordable home loan" programs, and these products have served populations previously believed to have been underserved (Avery, Bostic, Calem and Canner, 1996). In addition, there is evidence that lenders are sensitive to the distribution of their loans and adjust their lending patterns to achieve distributional targets within their loan portfolios (Evanoff and Segal, 1997).

Other developments during this period also may have influenced the access to credit for lower-income and minority families. In particular, the Department of Housing and Urban Development was empowered by the Congress to create new affordable housing goals for the government-sponsored enterprises (GSEs), Fannie Mae and Freddie Mac. These goals provide the GSEs with target levels of secondary market activity, with the objective of increasing the flow of mortgage credit to lower-income and minority families. Fannie Mae and Freddie Mac have

both responded by directing more resources to their activities in these areas. The GSEs' increased activity in the affordable housing market may have helped to make mortgages less expensive for lower-income and minority families, and may have contributed to the increased homeownership rates among these groups.

However, the issues of the impact and the ongoing value of these fair lending and community reinvestment laws are complex. For example, much of the recent increase in mortgage lending to minorities and lower-income households and neighborhoods has occurred among lenders not subject to CRA and by CRA-covered lenders in geographies where they do not have CRA responsibilities (i.e., locations in which they do not operate bank branches) (Avery, Bostic, Calem and Canner, 1999). Thus, much of the current increase in access to mortgages appears to be occurring outside the purview of the CRA and may be driven by market forces, such as the desire to increase diversification and serve market niches. On the other hand much of this increase may be a result of experience gained through previous CRA-related activities and, in this sense, can be viewed as arising indirectly as a result of CRA. Thus, interpreting observed trends is difficult.

IV. Multivariate analysis of changes in homeownership

Because the differences observed in section II in average homeownership rates across families grouped by income and race may simply be the result of differences in observable family-related characteristics, it is necessary to analyze homeownership in a multivariate setting. To that end, we estimate a discrete model of homeownership

$$(1a) \quad H_{it}^{*} = X_{it}\beta_t + \varepsilon_{it}, \quad \begin{array}{l} H_{it} = 1 \ \textit{if} \ H_{it}^{*} > 0 \\ H_{it} = 0 \ \textit{otherwise} \end{array}$$

Here, H is an indicator for whether family i owns their home in period t. The sign of the latent index (H^{*}) determines whether the homeownership indicator (H) takes on a value of zero or one. The vector X is a set of all factors that influence homeownership — including those representing family circumstances, the affordability of housing, credit market characteristics, and regulatory activities. β is a vector of parameters and ε is an error term which we will assume to be a standard normal. Racial (income class) identifiers are included in X and statistically significant

coefficients on these variables suggest that homeownership differs by race (income class) in an absolute sense among otherwise similar families at time period t. Much of the literature on racial differences in mortgage lending has focused on such cross-sectional parameters.

If we are to take seriously the proposition that mortgage and housing market developments and consumer regulation have had a measurable positive impact on homeownership, after controlling for factors in X other than race and income class, we should see smaller effects of race and income in 1998 than in 1989. A straightforward way to determine whether the unexplained residual associated with membership in these groups declined between 1989 and 1998 is to pool the CPS samples from 1989 and 1998 and estimate equation (1a) with the addition of a variable that interacts race and a sample year.

$$(1b)\ H_i^* = X_i\mathrm{B} + \Gamma R_i Y_{i98} + \varepsilon_i\ ,\quad \begin{matrix} H_i = 1\ \textit{if}\ H_i^* > 0 \\ H_i = 0\ \textit{otherwise} \end{matrix}$$

In this case, we interact race (R) with an indicator for being in the 1998 sample (Y_{i98}); a positive coefficient on this variable ($\Gamma>0$) indicates that differences in homeownership attributable solely to race have declined over time, as long as the coefficient on the race indicator alone remains negative. This approach assumes that the influence of the other variables in the model has not changed over time.

The estimated equations are reduced form models that ideally should include the full X vector containing all factors that potentially influence homeownership rates. However, for this analysis, the X vector only includes a set of family-specific characteristics related to preferences and the affordability of homeownership. Available data sources do not include the type of data required to directly measure the effects of credit market and regulatory activities in the model considered here. It is not immediately clear how one could explicitly control for such factors. Also excluded are wealth and credit history measures, as the CPS does not collect such information. These exclusions raise the possibility that we mis-state the collective influence of

variables that are observed and overstate the effects of race and income class.[11] Nonetheless, income tends to be a good proxy for both wealth and creditworthiness, attenuating concerns about omitted variables to some extent.[12]

Model Estimates

To test whether the homeownership trends highlighted in Section I are a function of differences in family-related characteristics across groups, we estimate equation (1b) on the pooled samples, both for all families and for income subgroups. We consider models estimated separately by income quintile because of the possibility that the process of becoming a homeowner differs for families with different income levels.[13]

In 1989, 66.5 percent of white families owned their residence. By 1998, that figure had risen to 69.2 percent. According to model estimates based on the entire sample in 1989, black and Hispanic families were, respectively, 15.4 and 13.5 percentage points less likely than white families to be homeowners, holding other characteristics constant (table 2). As of 1998 these disparities had shrunk by 2.1 percentage points for Hispanic families and 3.1 percentage points for black families (column 1). Across income quintiles (columns 2-5), disparities declined notably for Hispanic families in the second income quintile, and for black families in the second and fourth income quintiles.

Lower-income groups also enjoyed a relative increase in homeownership over this period. In 1989, families in the second income quintile were 13.9 percentage points less likely than families in the middle-income quintile to own their home. As of 1998 that disparity had shrunk by

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[11] If the omitted variable(s) are correlated with the explanatory variables, some of the parameter estimates $\hat{\beta}$ may be biased. Whether we over- or under-state the effects of model changes depends on the relative magnitudes of the correlations among the included and omitted variables.

[12] Using the Survey of Consumer Finances, Kennickell, Starr-McCluer, and Surette (2000) show strong positive associations between income and wealth and income and credit quality.

[13] It is difficult to partition the sample into groups based on relative income measures (e.g., income less than 80 percent of the area median income) using the CPS because the CPS does not identify the MSA that an observation is drawn from if the MSA includes fewer than 100,000 persons. Such observations comprise about 15 percent of the samples in 1989 and 1998. This censoring is done for confidentiality purposes.

2.7 percentage points. Moreover, families in the second income quintiles actually had lower average real incomes in 1998 than in 1989. Thus, despite a slight reduction in real income, homeownership among families in the second income quintile actually rose relative to other families.

These results about the declining homeownership disparities associated with race and income are fairly robust to changes in the model specification. Notably, these inferences are basically unchanged with the addition of more complex family composition indicators, richer age effects, and alternative groupings of marital status.

We note two exceptions to the robustness of these findings. The first exception concerns the MSA-level housing price measure, the exclusion of which indicates that the racial disparity in homeownership fell by more than the reported estimate. For example, among Hispanic (black) families the disparity declined 3.3 (3.4) percentage points when housing price is omitted. Such sensitivity highlights the important relationship between locality and affordability of homeownership among these groups.

The second exception arises when the empirical specification is changed to include a linear spline in the log of income, where the spline's kink-points are located at the log of the income quintile boundaries. In this model, the interaction terms (Black*Year98 and Hispanic*Year98) fall by about half a percentage point compared to the estimates reported in table 2, and have correspondingly lower levels of statistical significance. Nonetheless, for black families, our inferences remain basically unchanged.[14] For Hispanic families, the decline in the disparity becomes statistically indistinguishable from zero when the whole sample is used.[15] This latter finding may indicate that a single model is not appropriate to describe trends in homeownership for all families across all income groups.

However, pooling black and Hispanic families into a single "minority" category in the

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[14] The coefficient on the black interaction term has a p-value of about 7 percent in the model that includes all families regardless of income, and retains p-values below 5 percent in the second and fourth income quintiles.

[15] The p-value on the Hispanic interaction term has a p-value just under 10 percent in the model that includes the second income quintile only, and has a p-value larger than 10 percent for the model estimated with the full sample.

income-spline model reveals a decline in the homeownership disparity for this group quantitatively similar to those reported in table 2. The p-values on this variable are under 5 percent in the models estimated on the second and fourth quintiles, and for the estimates based on all families. Such a result reinforces the robustness of our conclusion that homeownership differences by race and income declined between 1989 and 1998.

V. Quantifying Contributions to the Trends

Thus far, we have observed that homeownership rates have increased overall and across all income and racial groups. In addition, the decline in the explanatory power associated with race, ethnicity, and lower-than-average income shown in section IV suggests that membership in these groups is less of a disadvantage in terms of achieving homeownership in 1998 than in 1989— even after controlling for family-related characteristics. It is therefore quite plausible that the regulatory and market developments outlined above explain some part of the increase in homeonwership during the 1990s. The natural question that arises is how much of these trends are due to observable changes in family-related characteristics and how much are due to credit market, regulatory, and other housing market changes. This is an extremely difficult question to answer. The ideal experiment would be to compare activities in two areas identical in every way except that one was subject to a given change and the other was not. Unfortunately, such an experiment is not possible. We are thus forced to use more indirect measures to infer market and regulatory effects. While efforts to resolve these issues are imperfect, it is feasible to gain some insights into the relative influence of changes in different factors on the observed trends in homeownership.

A useful way to summarize homeownership trends that accounts for both changes over time in all family characteristics together and changes in other factors that contribute to homeownership simultaneously is to estimate equation (1a) and apply a variation of the decomposition approach pioneered by Oaxaca (1973) and Blinder (1973). We estimate equation (1a) for the first and last years of the sample period,

$$(2) \quad H_0^* = X_0\beta_0 + \varepsilon_0$$
$$H_T^* = X_T\beta_T + \varepsilon_T$$

where 0 denotes the first year and T the last year of the sample period.[16]

We use Probit estimates of the parameters in (2) to quantify the changes in the average rates of homeownership, both overall and for certain subgroups. The total predicted change is

$$(3a) \quad \Delta H_{total} = \Phi(\hat{\beta}_T X_T) - \Phi(\hat{\beta}_0 X_0)$$

where (Φ) is the cumulative normal distribution function and ($\hat{\beta}$) represents the vector of estimated Probit parameters. We decompose the total change into two parts: Changes due to changes in the levels of all the variables in X — changes in household economic and demographic circumstances — and changes due to changes in all other factors.[17] Changes in homeownership associated with changes in the entire X-vector simultaneously can be calculated as

$$(3b) \quad \Delta H_X = \Phi(\hat{\beta}_0 X_T) - \Phi(\hat{\beta}_0 X_0)$$

— the predicted change in homeownership if the model remains the same, but the X variables change. Changes in homeownership attributable to changes in all other factors can be calculated as

$$(3c) \quad \Delta H_B = \Phi(\hat{\beta}_T X_T) - \Phi(\hat{\beta}_0 X_T)$$

The sum of the quantities in (3b) and (3c) equals the total change given in (3a). Comparisons of (3b) and (3c) will provide insights as to the sources of these changes — that is, whether they are attributable to changes in family-related characteristics or to changes in other factors.

Model estimates

Table 3 shows the estimates of (3a), (3b), and (3c). Estimates based on all families in the full sample indicate that about two-fifths of the overall two-percentage point increase in homeownership for the sample is attributable to changes in family-related characteristics. However, the precise value of (3b) is somewhat sensitive to the specification for income in the

[16]The individual household subscripts have been dropped for notational convenience.

[17]These latter changes arise from changes in the β weights assigned to particular variables in X, as well as changes in other factors not explicitly included in the empirical specification.

model used to predict homeownership.[18] As noted, such sensitivity suggests that estimates based on the entire sample, regardless of income, may not be the best approach to understanding the sources of changes in homeownership rates. Below, we examine homeownership within each income quintile separately to address this concern and to better gauge the extent to which homeownership trends can be explained by observable family-related characteristics.

Model estimates by income

Section I showed that homeownership rates increased between 1989 and 1998 for each income quintile and that increases were largest for families in the middle of the income distribution. Table 3 shows the decomposition of those changes using estimates based on samples grouped by income quintiles.

We observe a distinct pattern regarding the degree to which changes in family-related characteristics can explain changes in homeownership rates across the income quintiles. Among all families in the two lowest income quintiles, changes in characteristics explain very little of the observed change in homeownership. In fact, changes in family-related characteristics would actually suggest a small decline in homeownership. By contrast, among all families in the two upper-income quintiles, changes in family characteristics can explain a majority of the change in homeownership. Among those in the middle-income quintile, trends in homeownership are explained about equally by changes in family-related characteristics and changes in other factors.

This pattern of results supports the view that lower interest rates, regulatory changes, and technological and other banking market developments have had a desired public policy effect, namely increased homeownership for lower-income families. If these changes — particularly the changes in regulations targeted to lower-income families — were effective, then one would expect to observe that their role would be more important for lower-income families.[19] In the current

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[18] For comparison, calculating these quantities using estimates from the model that includes a linear spline in income estimated for all families (not reported) indicates that about four-fifths of the increase in homeownership can be attributed to changes in family-related characteristics.

[19] One might also expect lower interest rates and technological changes to benefit families with the lowest incomes the most, since the cost reductions associated with these factors are likely to be most important for members of this group.

methodology, this would be represented by the fraction that *cannot* be explained by changes in family-related characteristics being larger for lower-income families. This is what we find. This finding is somewhat surprising, as conventional wisdom might suggest changes in factors such as family income would be more important for lower-income families. However, the data here show that this "wisdom" is incorrect.

The pattern for families in the middle-income quintiles is also consistent with this view. Under this hypothesis, one would expect a murkier picture of the sources of homeownership trends to emerge from this group. For example, some households in this group are probably targets of CRA and other fair lending laws, while others are not. Thus, the relationship for the middle-income quintiles should fall between the upper and lower-income quintile, which is what we find.

Model estimates by race and income

Disaggregating the income quintiles by race reveals patterns consistent with much of the preceding discussion: For each racial or ethnic group, changes in family-related characteristics generally account for a smaller portion of the change in homeownership in the two lowest income quintiles than in the other income quintiles.

Black families in the first and second income quintile saw, respectively, a 0.9 and 3.7 percentage point increase in homeownership rates over the 1989 to 1998 period. Almost none of the increases in homeownership for either group are explained by changes in family-related characteristics. In contrast, a much larger fraction of the increases in homeownership among the middle and upper-income black families are explained by such changes.

Hispanic families in the lowest two income quintiles experienced a 3.5 and 6.4 percentage point increase in homeownership rates. Among such families, about half of the increase in homeownership is attributable to changes in family characteristics. For Hispanic families in the middle and upper-income group, almost all of the increase in homeownership rates is attributable to changes in observable family-related characteristics.[20]

For white families in the lowest three income quintiles, less than half of the increase in

[20] Hispanic families in the highest income group contradict this pattern, but there are relatively few such families in the sample.

homeownership can be explained by changes in family-related characteristics. This is particularly true in the second income quintile, where changes in family characteristics alone would predict a reduction in homeownership rates. For white families in the two upper-income groups, almost all of the increase is attributable to changes in family characteristics.

While these results are generally consistent with regulatory and market changes having a positive effect on minority and lower-income homeownership rates, trends for middle-income groups' are inconsistent with this hypothesis. Specifically, it is somewhat surprising that changes in family-characteristics explain the bulk of middle-income minority families' homeownership trends, but only half of white families' homeownership trends. The CRA and fair lending laws encourage banks to meet the credit needs of both lower-income and minority families. As such, if our hypothesis that regulatory changes are behind the observed trends is correct, one would expect the trends for minority families in the middle-income quintile to be explained by changes in family-related characteristics to a lesser extent than trends for white families in this income group. There is no obvious explanation for this anomaly.

VI. Summary

In general, the descriptive statistics and the multivariate analysis presented here indicate that homeownership rose more sharply for blacks, Hispanics, and lower-income families than for other families during the 1989 to 1998 period. The decompositions of these homeownership trends suggest that changes in family-related characteristics are largely *not* responsible for observed changes in homeownership among the lower-income and lower-income minority families. By contrast changes in these characteristics *are* primarily responsible for increases in homeownership observed among higher- income families. While the first result is consistent with the findings of previous research, the finding for higher-income families has not previously been identified.

These findings are broadly consistent with the hypothesis that changes in the market, the regulatory environment, and interest rates have had favorable effects on the housing markets for Black, Hispanic, and lower-income families. These groups have seen their homeownership rates rise out-of-proportion to improvements in their economic condition and other observable family-related characteristics. For several of these groups, changes in family-related characteristics

would actually have suggested a decline in homeownership, not the increases we observe. Such results are suggestive that fair lending regulations like CRA and ECOA, changes in the way mortgage applications by minority and lower-income families are considered by mortgage and housing market participants, the increased affordability arising from the low interest rate environment have all helped such families become homeowners.

While these results are suggestive, they are not conclusive. As noted, we have no variables with which to directly measure the effects of changes in markets or regulation on the homeownership process. This analysis evaluates the contribution of changes in families' observable demographics and economic circumstances to changes in homeownership rates. We interpret the residual as the contribution of changes in the factors omitted from X — credit market, secondary market, regulatory, and other housing market factors — to increases in homeownership rates. Also, crucial to our interpretation that changes in regulatory and market environments are behind the trends we observe for lower-income and minority households is the assumption that we have not omitted trends in relevant family-related characteristics. Each family's creditworthiness, for example, is omitted from the analysis, an omission that may bear on the homeownership process. If creditworthiness has changed in important ways for lower-income or minority families, the analysis could wrongly attribute increased homeownership among these groups to the market or regulatory regime.

Such caveats notwithstanding, we believe these trends are compelling. They suggest that something dramatic has taken place in the homeownership process faced by lower-income families. Future researchers may use the 1990 and forthcoming 2000 Decennial Census of Population and Housing to verify that the patterns we identify in the current research are robust. An additional task for future research is to identify more precisely the changes in the homeownership process that have led to the observed homeownership trends. One possible approach might be to compare trends in the distribution of loans by different types of mortgage market participants, which could provide valuable information as to which markets are driving the increase in homeownership and potentially help to identify the precise mechanisms by which this increase is taking place.

Table 1. Descriptive statistics for the CPS samples

Panel A - 1989 CPS, full sample and by race

Characteristic	All	White	Black	Hispanic	Other
Homeowner	.606	.665	.377	.394	.506
1989 house value	128709.1	121653.8	129024.6	174858.6	196356.6
Age	39.6	39.923	38.956	37.990	39.228
Mean income	49845.55	53682.43	33045.18	36062.54	51428.68
Median income	42043.65	46265.17	25397.79	28829.93	41185.61
Female head	.231	.197	.445	.250	.212
Central city	.264	.201	.511	.477	.386
Suburb	.372	.399	.218	.335	.376
Rural	.204	.228	.144	.073	.132
Other Place	.160	.172	.127	.115	.106
Northeast	.202	.210	.160	.190	.182
Midwest	.244	.269	.207	.077	.153
South	.342	.323	.530	.309	.169
West	.212	.198	.103	.425	.496
MSA	.789	.763	.855	.924	.866
Married	.610	.642	.387	.628	.640
Widowed	.034	.031	.058	.027	.033
Divorced	.141	.143	.163	.110	.101
Separated	.042	.029	.110	.075	.037
Single	.172	.156	.283	.160	.189
No. of Children	.887	.822	1.019	1.274	1.099
No. of Adults	1.924	1.908	1.864	2.124	2.102
Pct. w/ Children	.474	.453	.511	.609	.557
Less than HS degree	.165	.123	.265	.456	.162
H.S. degree	.371	.380	.400	.285	.228
Some college	.197	.202	.197	.153	.182
Col. degree or more	.266	.295	.139	.106	.427
Income quintile 1	.200	.155	.398	.337	.242
Income quintile 2	.200	.191	.236	.246	.191
Income quintile 4	.200	.218	.125	.144	.168
Income quintile 5	.200	.226	.090	.091	.234
Black	.120				
White	.776				
Hispanic	.074				
Other	.030				

No. of observations	38964	30397	3817	3544	1206

Table 1 (continued).

Panel B - 1989 CPS, by income quintile

Characteristic	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Homeowner	.298	.458	.630	.770	.875
1989 house value	118233.1	119589.4	125053.4	130650.6	150015.8
Black	.239	.141	.090	.075	.054
Other	.037	.029	.025	.025	.035
Hispanic	.124	.090	.0673	.053	.033
Age	37.7	37.5	38.9	40.8	43.4
Mean income	10520.04	27008.22	42292.33	61049.27	108342.9
Female head	.499	.320	.196	.093	.048
Central city	.353	.285	.248	.218	.216
Suburb	.238	.308	.367	.433	.513
Rural	.254	.251	.223	.177	.114
Other place	.155	.157	.162	.171	.157
Northeast	.162	.178	.198	.216	.252
Midwest	.235	.237	.253	.261	.234
South	.393	.374	.331	.311	.302
West	.210	.211	.218	.211	.211
MSA	.740	.741	.769	.815	.880
Married	.268	.469	.635	.791	.887
Widowed	.070	.043	.028	.016	.012
Divorced	.232	.196	.143	.092	.043
Separated	.109	.049	.028	.016	.009
Single	.320	.243	.167	.085	.048
No. of children	.916	.815	.895	.956	.853
No. of adults	1.458	1.683	1.880	2.138	2.462
Pct. w/ children	.446	.437	.476	.521	.491
Less than HS degree	.353	.194	.132	.101	.047
H.S. degree	.386	.433	.409	.378	.248
Some college	.160	.203	.219	.220	.184
Col. degree or more	.100	.171	.240	.300	.521
No. of observations	7822	7943	7919	7784	7496

Table 1 (continued).

Panel C - 1998 CPS, full sample and by family race

Characteristic	All	White	Black	Hispanic	Other
Homeowner	.626	.692	.424	.431	.520
1997 house value	122166.7	116988.4	121634.7	143864.4	164722.4
Age	41.0	41.5	40.0	38.6	40.2
Mean income	54030.75	59643.77	34558.12	36270.49	55984.02
Median income	41540	46621	26148.3	27264.16	43046.39
Female head	.251	.215	.468	.255	.203
Central city	.261	.195	.485	.418	.370
Suburb	.418	.445	.277	.374	.468
Rural	.184	.212	.130	.089	.089
Other place	.137	.149	.108	.119	.073
Northeast	.187	.196	.167	.166	.149
Midwest	.234	.270	.180	.077	.140
South	.357	.333	.561	.329	.219
West	.222	.202	.092	.429	.492
MSA	.813	.786	.866	.911	.909
Married	.574	.606	.352	.608	.631
Widowed	.025	.024	.039	.021	.023
Divorced	.159	.166	.174	.114	.096
Separated	.042	.032	.081	.066	.033
Single	.199	.172	.355	.191	.216
No. of children	.866	.796	.944	1.274	.907
No. of adults	1.872	1.845	1.767	2.116	2.103
Pct. w/ children	.4586	.434	.481	.613	.477
Less than HS degree	.127	.083	.175	.408	.111
H.S. degree	.312	.312	.380	.267	.214
Some college	.275	.285	.287	.205	.223
Col. degree or more	.285	.320	.157	.120	.451
Income quintile 1	.200	.155	.353	.337	.203
Income quintile 2	.200	.184	.251	.262	.175
Income quintile 4	.200	.222	.140	.120	.186
Income quintile 5	.200	.234	.082	.087	.228
Black	.129				
White	.734				
Hispanic	.096				
Other	.042				

No. of observations	36248	25974	3592	5177	1505

Table 1 (continued).

Panel D - 1998 CPS, by income quintile

Characteristic	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Homeowner	.306	.480	.662	.792	.888
1997 house value	116123.7	116025.2	117719.1	122651	138300.3
Black	.227	.161	.112	.090	.052
Other	.043	.037	.044	.039	.048
Hispanic	.161	.125	.093	.057	.042
Age	38.7	38.9	40.5	41.9	44.7
Mean income	9864.83	25866.27	41751.49	62607.9	129996.8
Female head	.521	.350	.213	.116	.054
Central city	.343	.296	.241	.217	.207
Suburb	.283	.356	.405	.474	.570
Rural	.225	.215	.213	.168	.100
Other place	.150	.134	.141	.141	.122
Northeast	.181	.162	.177	.192	.223
Midwest	.202	.230	.246	.258	.235
South	.391	.389	.360	.338	.306
West	.226	.219	.217	.211	.236
MSA	.773	.783	.785	.829	.897
Married	.223	.396	.605	.769	.879
Widowed	.052	.031	.020	.013	.009
Divorced	.247	.229	.165	.104	.053
Separated	.090	.060	.030	.017	.010
Single	.387	.284	.180	.097	.050
No. of children	.849	.779	.870	.930	.900
No. of adults	1.398	1.612	1.888	2.128	2.332
Pct. w/ children	.418	.411	.460	.506	.497
Less than HS degree	.287	.159	.104	.059	.028
H.S. degree	.361	.359	.352	.312	.178
Some college	.245	.306	.290	.300	.233
Col. degree or more	.107	.176	.254	.328	.562
No. of observations	7440	7396	7308	7108	6996

Table 2. Probability derivatives for race and income variables

Panel A - Full sample and income quintile samples

	All families	Income quintile I	II	III	IV	V
Black	-15.4**	-11.5**	-14.9**	-12.1**	-16.9**	-9.8**
Black*Year1998	3.1**	1.9	5.8**	-0.6	6.0**	0.6
Hispanic	-13.5**	-11.6**	-14.0**	-11.6**	-6.6**	-7.1**
Hispanic*Year1998	2.1*	2.3	4.4*	0.8	-0.1	1.6
Homeownership rate						
Whites - 1989	66.5	36.8	50.1	66.0	79.6	88.6
Whites - 1998	69.2	37.9	52.8	70.3	81.5	90.4
Number of observations	75,212	15,262	15,339	15,227	14,892	14,492

Panel B - Racial group samples

	All families	Race/Ethnicity White	Black	Hispanic
Quintile 1	-27.6**	-25.1**	-27.3**	-29.5**
Quintile 1*Year1998	1.1	0.9	1.8	1.2
Quintile 2	-13.9**	-12.5**	-13.9**	-14.3**
Quintile 2*Year1998	2.7**	2.3**	4.0	1.6
Quintile 4	9.4**	8.1**	2.5	16.0**
Quintile 4*Year1998	1.3	0.9	10.1**	-0.2
Quintile 5	20.1**	17.2**	17.0**	26.5**
Quintile 5*Year1998	0.9	1.4	1.2	3.9
Homeownership rate				
Quintile 3 - 1989	63.0	66.0	51.8	49.3
Quintile 3 -1998	66.2	70.3	53.8	53.4
Number of observations	75,212	56,371	7,409	8,721

** - p<.05
* - p<.10

Table 3. Homeownership trend decompositions (percent)

	Estimated 1989 rate	Estimated 1998 rate	Estimated 1998 rate	Total change	Change due to ΔX	Change due to others	-log(L)
Model	1989	1989	1998				
Family-related chars.	1989	1998	1998				
Full sample							18761
All families	60.57	61.34	62.57	2.00	0.77	1.23	
White	66.50	68.11	69.25	2.75	1.61	1.14	
Black	37.75	39.86	42.38	4.63	2.11	2.52	
Hispanic	39.25	41.46	43.11	3.87	2.21	1.65	
Other	50.68	54.08	51.91	1.22	3.40	-2.17	
Quintile 1							3734
All families	29.84	29.73	30.61	0.78	-0.11	0.88	
White	36.83	37.32	37.90	1.07	0.49	0.58	
Black	20.11	19.71	21.00	0.89	-0.40	1.29	
Hispanic	17.41	19.34	20.95	3.54	1.93	1.61	
Other	20.56	21.18	21.14	0.58	0.62	-0.03	
Quintile 2							4537
All families	45.77	44.76	48.02	2.25	-1.01	3.26	
White	50.08	49.78	52.78	2.70	-0.29	3.00	
Black	34.14	33.31	37.84	3.70	-0.83	4.53	
Hispanic	32.30	35.27	38.70	6.39	2.97	3.43	
Other	34.34	34.86	36.92	2.58	0.52	2.06	
Quintile 3							4283
All families	62.98	64.22	66.11	3.13	1.24	1.89	
White	65.96	68.12	70.25	4.29	2.17	2.13	
Black	51.89	54.54	53.74	1.85	2.65	-0.80	
Hispanic	49.28	52.43	53.41	4.14	3.16	0.98	
Other	42.51	47.07	53.68	11.16	4.55	6.61	
Quintile 4							3583
All families	76.93	79.01	79.17	2.23	2.08	0.16	
White	79.58	81.68	81.51	1.93	2.11	-0.18	
Black	57.69	62.13	69.73	12.04	4.45	7.60	
Hispanic	65.33	70.88	70.39	5.05	5.55	-0.50	
Other	69.83	74.14	65.02	-4.80	4.32	-9.12	
Quintile 5							2419
All families	87.46	88.81	88.85	1.39	1.35	0.04	
White	88.70	90.13	90.45	1.75	1.43	0.32	
Black	73.98	76.70	77.83	3.85	2.72	1.13	
Hispanic	77.94	79.27	81.71	3.77	1.33	2.44	

Other	86.43	86.70	78.55	-7.88	0.27	-8.15

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