

The contents of this report are the views of the contractor and do not necessarily reflect the views or policies of the U.S. Department of Housing and Urban Development or the U.S. Government.

Executive Summary

This analysis uses recent metropolitan area samples of the American Housing Survey (AHS) for 1998, 2002, and 2004 to investigate differences in the terms, conditions, and use of mortgage financing alternatives, and see how financing and mortgage rates differ for Hispanics as compared to other ethnic groups across a number of different U.S. housing markets. The principal focus of the study is to examine the extent to which differences in the interest rates obtained by homeowners of different race/ethnicity and income levels can be explained by differences in characteristics of the borrowers, the property, and the loan itself. First mortgages are stratified into submarkets by conventional versus VA/FHA and home purchase versus refinance. In addition, home purchase loans are evaluated for recent movers as well as a full sample of all owners who have mortgage debt. The recent mover sub-sample allows the consideration of how choices made under current market conditions compare with the situation of the full sample of household whose current home mortgage circumstances reflect financing and housing decisions made over time—often many years prior to the interview year. Finally, for the full sample, both junior mortgages and home equity loans, which have not previously been considered in the mortgage pricing literature, are evaluated to see how their terms, conditions, and use vary across household categories. While limitations in the information available in the AHS do not allow the determination of whether or not discrimination exists for minorities in the sample, this data set does identify important differences in the characteristics of these households, which affect mortgage pricing. Such insights often suggest avenues for future research and possible policy implications.

In general, black households in the sample do not appear to be doing quite as well financially as either the white or Hispanic households, as evidenced by substantially lower incomes and house values across all markets for African-Americans. Hispanic households appear to have a relatively high burden of first mortgage debt. Considering lower-income families in the full sample 67 percent of the Hispanic households have a housing-cost-to-income ratio that exceeds 32 percent. For comparable blacks and whites the percentages are 62 percent and 61 percent respectively. For recent movers, in the conventional market, 49.4 percent of lower-income Hispanic families have loan-to-value ratios that are greater than 90 percent. The percentage for comparable black households is 44.4 percent and for whites only 29.7 percent.

Findings for First Mortgages

In the pricing regressions for first mortgages in the conventional market, even when controlling for differentials in available household, loan, and property characteristics, blacks and Hispanics (particularly non-white Hispanics) have significantly higher interest rates than comparable white households. For African-Americans this differential is 21 to 42 basis points, while for non-white Hispanics the range is 13 to 15 basis points. While these differences cannot be definitively linked to discriminatory treatment in mortgage markets due to the lack of information on household credit, and net-wealth or the financial institutions extending the credit (particularly regarding their underwriting policy), these results do suggest that future work is needed to answer a number of questions. Why do the observed interest-rate differentials exist between minorities and whites? Why is the magnitude of this effect so different between Hispanics and blacks? Why do white and non-white Hispanics have

systematically different results? Finally, what is it that causes the only significant differential across racial groups in the FHA/VA market to be found for blacks in the full sample and not elsewhere?

In the pricing regression for first mortgages, several other independent variables appear to be consistent predictors of loan rates and have mean values that are substantially different between comparable minority and white households. In particular, educational attainment is generally an important determinant of interest rates. There are substantial differences in average educational attainment across racial/ethnic groups that might be expected to result in higher interest rates for minorities. This differential is most pronounced for Hispanic households in the full sample. For example, 12.3 percent of low-income Hispanics with conventional mortgages have achieved a college degree in the full sample and 7.9 percent in the FHA/VA market. For blacks, these numbers are 20.9 percent and 18.4 percent. In contrast, figures for comparable white household heads are 28.9 percent and 21.2 percent respectively. In the recent mover sample these educational differences also exist, but are not as pronounced.

Another variable that is consistently significant in these pricing regressions is current house value, with higher interest rates being associated with lower valued housing. Black house values are substantially lower than similar Hispanic or white households. In particular, for the low-income group in the conventional market for the full sample, the average house value for blacks is \$109,883, for Hispanics it is \$145,954, and for whites \$160,217. In all markets but the conventional home purchase market, Hispanics and whites have relatively comparable house values. This suggests that African-Americans generally face higher interest rates because of the quality of their owned units. Finally, in the recent mover sample (the sub-sample for which loan-to-value ratios can be calculated), minority households in the conventional market tend to have a greater likelihood of being in the highest loan-to-value categories, which also contributes to having higher interest rates.

Findings for Junior Mortgages and Home Equity Loans

Regarding junior mortgages and home equity loans, white households tend to be more active in these markets than minority households. However, for Hispanic households who participate in these markets, particularly lower-income families, the amount of debt incurred is relatively high. For junior mortgages, Hispanic households have average debt (for just this type of loan) of \$37,591 compared to \$34,514 for white households, and \$21,749 for African-American families. Considering these debt levels relative to annual income provides additional perspective regarding this issue. Specifically, for low-income households, this ratio is 114 percent ($\$37,591/\$32,957$) for Hispanics, 104 percent for whites, and only 77.3 percent for blacks. Similarly, for home equity loans, the ratio of home equity debt to current annual income is about 86.5 percent ($\$26,142 / \$30, 236$) for Hispanic low-income households as compared to 75.5 percent and 72.5 percent for similar blacks and whites, respectively.

In the regression analysis, controlling for other factors that might be expected to influence pricing, black households pay significantly higher rates for both second mortgages and home equity loans, whereas only non-white Hispanics have significantly higher rates in the home equity market. For blacks the estimated differences with whites are 44.7 and 52.3 basis points, respectively. For non-white Hispanics the differential in the home equity market is 62.7 basis points. For second mortgages education plays a role in determining interest rates, but is not significant in the home equity sector. As before, the minorities participating in these markets have substantially less education than

the current mortgage interest rate is the dependent variable with explanatory variables grouped into three broad categories: (1) the characteristics of the borrower, (2) the characteristics of the property, and (3) the characteristics of the loan itself.⁶ Separate regression models are estimated both by purpose (home purchase and refinance) and by market type (conventional and FHA/VA)

There is, of course, no “perfect” publicly available data set to investigate the issues and policy concerns related to variations in mortgage terms, conditions, and use across key borrower groups. A limiting factor within the AHS, as in most data, is a lack of information on the families’ net-wealth and credit history. Also the AHS does not have information on the institutions that made the loan or the specifics of their underwriting criterion.⁷ Consequently, it is not possible to definitively answer the question of whether there is discrimination in mortgage pricing. However, one can investigate differences in the signs and significance of the independent variables included in the pricing regression, draw inferences about the nature of the mortgage pricing process experienced by Hispanics (as compared to others), and suggest avenues for future research and potential policy concerns. To this end, it is important to note that studies have demonstrated that the financial variables from the AHS appear to be, generally, quite reliable.⁸ Consequently, it is reasonable to assert that any implications for future research and policy development regarding both the pricing of loans, and the differences found across other dimensions of the financing, for Hispanic, black and white households in the analysis are based on mortgage information that, while limited in scope, is statistically reliable across a national sample. In addition, due to adequate sample size, the study is able to present new, reliable information for such dimensions as junior mortgages and home equity loans.

This report consists of five sections in addition to this introduction. Section two presents a brief overview of recent literature on mortgage pricing in order to provide a frame of reference for our analysis. The third section presents an overview of the data upon which the study is based and several data compilations, including the financial variables noted above. In this section various aspects of mortgage loans by type and characteristics are presented and discussed. These results are also shown along the dimensions of income and minority household status. In section four, the basic specification of the regression analysis is presented, as well as the results for first mortgages for both the full sample and, separately, recent movers. In section five, means and regression analyses are presented for junior and home equity lending. Conclusions follow in the last section.

⁶ The set of variables that define these categories are shown below in Table 4.

⁷ However, you can identify that the loan was made by a financial institution to the family in the sample. That is, it was not made by a relative or assumed from the seller.

⁸ See for example, Lam, Ken and Kaul Bulbul (2003) “Analysis of Housing Finance Issues Using the American Housing Survey”. Report prepared for the U.S. Department of Housing and Urban Development, Office of Policy Development and Research.

Since the analysis of Susin (2003) uses the national AHS data to explore mortgage pricing it is important to delineate clearly the differences between his and our analysis. First, Susin's paper considers all outstanding mortgages for all homeowners in a given year (2001). While we too consider all mortgages at a given point in time, we also consider originations for a sample of homeowners who have moved within a year of their interview. This approach is consistent with the recent study by Lam and Kaul (2003), which suggests that the reliability of AHS financial data is better the closer respondents are to the date of loan origination. In addition, borrower characteristics, loan characteristics, and property characteristics are the approximate characteristics that existed when the loans were originated. Thus, it should provide a better picture of how those characteristics affect market interest rates currently. Finally, our approach differs from Susin's analysis and represents substantial extension of preliminary work that we have done on this question using AHS data (see Boehm, Schlottmann, and Thistle (2004)) in several additional ways. First, it employs a pooled set of the AHS MSA samples for the years 1998, 2002, and 2004. This allows for a substantially larger sample size, which becomes particularly important as one begins to stratify by loan types and minority subgroups. In addition, the markets in which households reside can be identified. Thus, control variables can be included in the interest rate regression for the market in which the loan was made in addition to the year in which it was originated. Also, because of the increased sample size, this analysis separately analyzes first mortgages, junior mortgages (primarily second mortgages), and home equity loans (including lines of credit) individually, while these previous works focus exclusively on first mortgages.

Table 1 provides information on the share of homeowners in the sample by race/ethnicity and income who have one of the three types of loans used in this study (i.e., first, junior, and home equity).¹⁶ The percent of households by race with first mortgages is consistently lower among low-income households as might be expected. For example, no group of low-income households exceeds 59 percent of having a first mortgage as contrasted to the minimum of 74 percent among higher-income households (as is true of African-American families). Similarly, low-income households are much less likely to use their homes as sources of financing related to junior mortgages or home equity loans. Compared to other ethnic groups, white households are much more likely to use their home as a source of a home equity credit, with 4.82 percent of low-income white households utilizing this credit alternative compared to about 2 percent of blacks and Hispanics.

dwelling acting as collateral for the loan. For these reasons, and because they are recorded separately in the AHS, these two loan categories are kept separate for the purpose of this analysis.

¹⁶ Based upon the authors' prior research, we use a standard definition of low-income as those households below 80 percent of the area median income as defined by HUD. Experimentation with this definition (e.g., 60 percent, and 70 percent) did not lead to any substantive differences in the results for this analysis.

Table 1
Means
All 1st Mortgages^a

	Low Income				High Income		
	Hispanic	Black	White		Hispanic	Black	White
Percent of Owners with First Mortgage	58.7%	53.9%	43.1%		80.1%	73.7%	74.9%
Percent of Owners with Junior Mortgage	3.1%	4.1%	3.1%		8.8%	6.5%	7.4%
Percent of Owners with Home Equity Credit Line	2.2%	1.8%	4.8%		5.9%	3.6%	10.4%

^a Data includes both Home Purchase Loans and Refinancings

Table 2
Means
All 1st Mortgages^a

Variable Name	Low Income			High Income		
	Hispanic	Black	White	Hispanic	Black	White
Interest Rate	7.30%	7.39%	6.99%	6.99%	7.23%	6.88%
Monthly Debt Service	\$667	\$547	\$647	\$966	\$796	\$961
Monthly Housing Cost	\$1,071	\$925	\$1,074	\$1,522	\$1,264	\$1,524
Annual Household Income	\$30,301	\$27,949	\$30,369	\$101,999	\$90,153	\$108,451
Current House Value	\$146,560	\$107,608	\$165,022	\$216,758	\$155,419	\$230,437
LTV >1	10.1%	12.8%	12.5%	12.7%	10.6%	10.8%
.9<LTV<=1	48.2%	44.9%	30.8%	40.1%	49.9%	30.1%
.8<LTV<=.9	9.7%	7.9%	10.4%	14.8%	10.5%	14.5%
LTV<=.8	32.0%	34.5%	46.2%	32.4%	28.9%	44.7%
Housing Cost / Income >.32	66.8%	61.7%	60.7%	10.7%	7.3%	8.3%
.22<Housing Cost / Income <=.33	23.9%	26.2%	26.2%	28.9%	22.4%	24.0%
.16<Housing Cost / Income <=.22	6.5%	8.5%	8.8%	28.1%	30.2%	29.2%
Housing Cost / Income <=.16	2.7%	3.6%	4.2%	32.3%	40.0%	38.6%
Debt Service / Income <.2	59.1%	52.4%	54.6%	14.5%	10.5%	10.5%
.15< Debt Service / Income <=.2	15.8%	18.0%	17.4%	19.1%	16.2%	16.6%
.10< Debt Service / Income <=.15	10.1%	14.6%	14.0%	27.8%	28.1%	30.7%
.10< Debt Service / Income <.10	15.0%	15.0%	13.9%	38.6%	45.3%	42.2%
Conventional - Purchase	52.7%	45.7%	53.8%	49.1%	45.5%	51.1%
Conventional - Refinance	15.5%	13.2%	22.7%	21.8%	11.9%	28.9%
FHA / VA - Purchase	27.2%	37.6%	19.8%	23.6%	36.7%	15.6%
FHA / VA - Refinance	4.6%	3.5%	3.7%	5.6%	6.0%	4.4%
Number of Observations	1,821	2,118	3,191	3,650	2,771	10,210

^a Data includes both Home Purchase Loans and Refinancings

**Table 3
Means
Recent Mover 1st Mortgagors**

Variable Name	Low Income				High Income		
	Hispanic	Black	White		Hispanic	Black	White
Interest Rate	7.20%	6.78%	6.65%		6.87%	6.86%	6.72%
Monthly Debt Service	\$766	\$651	\$754		\$1,113	\$990	\$1,133
Monthly Housing Cost	\$1,134	\$994	\$1,167		\$1,612	\$1,421	\$1,665
Annual Household Income	\$31,695	\$31,309	\$32,675		\$94,245	\$90,048	\$106,900
Current House Value	\$135,107	\$116,648	\$162,739		\$213,121	\$184,143	\$242,083
LTV >1	2.8%	5.9%	1.9%		4.0%	4.3%	1.6%
.9<LTV<=1	56.9%	51.9%	40.8%		47.2%	57.5%	35.4%
.8<LTV<=.9	11.4%	7.6%	10.0%		16.7%	9.8%	14.3%
LTV<=.8	28.9%	34.6%	47.3%		32.0%	28.4%	48.7%
Housing Cost / Income >.32	68.3%	59.7%	62.5%		16.3%	10.7%	11.4%
.22<Housing Cost / Income <=.33	25.6%	30.5%	27.8%		35.5%	30.0%	29.8%
.16<Housing Cost / Income <=.22	3.6%	7.0%	6.3%		25.7%	30.5%	31.6%
Housing Cost / Income <=.16	2.5%	2.7%	3.4%		22.4%	28.8%	27.2%
Debt Service / Income <.2	64.0%	58.6%	62.1%		24.3%	18.9%	17.7%
.15< Debt Service / Income <=.2	17.0%	19.5%	17.8%		22.8%	23.6%	23.4%
.10< Debt Service / Income <=.15	6.1%	9.2%	8.2%		27.8%	27.5%	31.0%
.10< Debt Service / Income <.10	12.9%	12.7%	11.9%		25.1%	30.0%	27.9%
Conventional - Purchase	61.2%	53.5%	70.3%		68.0%	58.8%	77.8%
FHA / VA - Purchase	38.8%	46.5%	29.7%		32.0%	41.3%	22.2%
Number of Observations	394	370	522		777	560	1,715

somewhat lower than for the full sample, particularly for the percentage of households with LTV that exceed one. For example, none of the mean percentages of loans with an LTV exceeding one are higher than 6 percent across recent mover cohorts. This is in marked contrast to the full sample where corresponding figures are as high as approximately 13 percent. Although interesting, it is not obvious why this should be the case.

Regression Analysis

As noted above, a regression model is employed to explore the determinants of interest rates for first mortgages both by purpose (home purchase and refinance) and by market type (conventional and FHA/VA). In addition, we also separate recent movers from the full sample. Table 4 shows the average interest rates for each of the subgroups to be employed in the regression analysis. A number of interesting differences can be observed across these subgroups. First, in all cases but one (Hispanic families in the high-income FHA/VA purchase market for the full sample), white households have lower interest rates than comparable minority families. As might be expected, FHA/VA loans have higher average rates than comparable conventional loans. In several instances for lower income homeowners, one minority group has a substantially higher average interest rate than other households. Specifically, for low-income households who recently moved and purchased a home, Hispanic families pay substantially more than others, approximately 7.2 percent as compared to 6.6 to 6.8 percent for African Americans and whites. For refinanced loans, in the conventional market blacks pay more than Hispanics or whites, approximately 7.5 percent versus 6.9 and 6.6 percent, respectively. In contrast, Hispanic rates are the highest at 7.2 percent while blacks and whites both averaging 6.7 percent.

Table 4
First Mortgage Interest Rates by Sample, Loan Type and Household Type

			Household Type					
Loan			Low Income			High Income		
Sample	Market	Purpose	Hispanic	Black	White	Hispanic	Black	White
Full	Conventional	Purchase	7.39	7.37	7.09	7.13	7.30	7.04
Full	FHA / VA	Purchase	7.45	7.41	7.20	7.22	7.38	7.27
Mover	Conventional	Purchase	7.20	6.81	6.63	6.89	6.85	6.70
Mover	FHA / VA	Purchase	7.21	6.73	6.70	6.83	6.86	6.80
Full	Conventional	Refinance	6.90	7.49	6.62	6.49	6.79	6.43
Full	FHA / VA	Refinance	7.21	6.73	6.70	6.83	6.86	6.80

Our basic regression specification is consistent with the regression models utilized by several authors in Retsinas and Belsky (2002). In particular, for each ethnic subgroup, the current interest rate is the dependent variable with explanatory variables grouped into three broad categories: (1) the characteristics of the borrower, (2) the characteristics of the property, and (3) the characteristics of the loan itself. The list of included factors available from the AHS is shown in Table 5.

An additional aspect of race/ethnicity is identified for this analysis that is normally not available, namely Hispanic households can be split into white and nonwhite households. Because the AHS asks questions about race separate from Hispanic ethnicity, it allows a unique opportunity to compare results for Hispanic households that have different racial characteristics. Consequently, Hispanic households were split into two distinct groups: white and non-white Hispanics.²⁰ Note, that the percentage of white and non-white Hispanics varies depending upon whether one considers the refinancing or home purchase sub-samples. For home purchases, 35 to 46 percent of Hispanics are classified as non-white. For refinanced loans, only about 25 percent of the Hispanic households are classified as non-white.²¹ In addition to a set of race/ethnicity variables, sex, age, and education are also included as controls. Women, the elderly, and minorities are protected classes under discrimination laws and some believe these groups may be at a disadvantage in terms of shopping for and negotiating loan rates. It also is hypothesized that more educated individuals will generally be more able to assess financial market opportunities and might be expected to fare better in finding the lowest cost financing alternatives. Similarly, whether or not the household is a first-time homeowner is included because households purchasing for the first time are likely to have less financial sophistication, and find themselves in somewhat different financial circumstances than those who have already purchased a house, arranged for its financing and, by owning, built up equity in that house and demonstrated a willingness and ability to make mortgage payments.

In addition, three other household characteristics are included in an attempt to control for a household's ability to make their debt service payments. The ratio of income to household size captures the extent to which family size and related expenditures on the needs of family members could impact default risk. A discrete measure of whether or not household savings is equal to or greater than \$20,000 is the only wealth measure available in the AHS. It too might impact default risk, i.e., those households with a substantial amount of savings might be expected to get lower interest rates since they have a greater financial cushion to draw upon to avoid default. Finally the categorical variables representing various levels of housing cost relative to income should be a primary determinant of default risk. Lower values of this ratio should also be correlated with lower interest rates.

²⁰ The designation of race/ethnicity is straightforward for households consisting of a single individual. For married couples, if one individual was white and the other Hispanic or African-American the household was deemed Hispanic or African-American, respectively. For the case in which a head and spouse were both Hispanic, if either the spouse or the head was classified as a non-white Hispanic the household was designated to be non-white Hispanic. If one was Hispanic and the other African-American the household was classified as black.

²¹ The exact percentages for each sub-sample analyzed in this report are presented in Tables 10 -12.

**Table 5
Variable Names and Definitions**

Variable Name	Variable Definition
Loan Characteristics	
Interest Rate	Current interest rate on the loan expressed as a percent.
10 Year Loan Term	1 = loan term is 10 years; 0 = otherwise
15 Year Loan Term	1 = loan term is 15 years; 0 = otherwise
20 Year Loan Term	1 = loan term is 20 years; 0 = otherwise
25 Year Loan Term	1 = loan term is 25 years; 0 = otherwise
30 Year Loan Term	1 = loan term is 30 years; 0 = otherwise
Loan Term <=5 years	1 = loan term is less than or equal to 5 years; 0 = otherwise
5 - 10 Year Loan Term	1 = loan term is greater than 5 years and less than or equal to 10 years; 0 = otherwise
10 - 15 Year Loan Term	1 = loan term is greater than 10 years and less than or equal to 15 years; 0 = otherwise
15 - 20 Year Loan Term	1 = loan term is greater than 15 years and less than or equal to 20 years; 0 = otherwise
20 - 30 Year Loan Term	1 = loan term is greater than 20 years and less than or equal to 30 years; 0 = otherwise
Loan Term > 30 years	1 = loan term is greater than to 30 years; 0 = otherwise
Loan to Value >1.0	1 = Loan-to-value ratio greater than 100 percent; 0 = otherwise
.9<Loan to Value<=1.0	1 = Loan-to-value ratio greater than 90 percent and less than or equal to 100 percent; 0 = otherwise
.8<Loan to Value <=.9	1 = Loan-to-value ratio greater than 80 percent and less than or equal to 90 percent; 0 = otherwise
Loan to Value <=.8	1 = Loan-to-value ratio less than or equal to 80 percent; 0 = otherwise
Loan Payments Fixed	1 = Loan payments are fixed during the life of the loan; 0 = otherwise
Private Mortgage Insurance	1 = Loan has private mortgage insurance; 0 = otherwise
Year of Origination	Discrete variables indicating the year in which the mortgage was originated.
Household Characteristics	
Income/Household Size	Monthly income in 1000 dollar units of measure relative to household size
Not High School Grad.	1 = did not graduate from high school; 0 = otherwise
High School Grad.	1 = high school graduate; 0 = otherwise
Post High School	1 = Some education after high school, but not a college graduate; 0 = otherwise
College Graduate	1 = College graduate or more; 0 = otherwise
Married	1 = Married couple or partner present; 0 = otherwise
Single Female	1 = Household head a single female; 0 = otherwise
Single Male	1 = Household head a single male; 0 = otherwise
Family Size	Number of persons in household
Household Income	Household income in \$10,000 units

Table 5 (Continued)
Variable Names and Definitions

Variable Name	Variable Definition
Age 24 or less	1 = Age of household head less than 24 years of age; 0 = otherwise
Age 25 - 44	1 = Age of household head 24 to 44 years of age; 0 = otherwise
Age 45 - 61	1 = Age of household head 45 to 61 years of age; 0 = otherwise
Age 62 or more	1 = Age of household head 62 years of age or greater; 0 = otherwise
Savings 20k or more	1 = Household has \$20,000 in savings or more; 0 = otherwise
White Household ^{a, b}	1 = Household's race designated to be white; 0 = otherwise
Black Household ^{a, b}	1 = Household's race designated to be black; 0 = otherwise
White Hispanic Household ^{a, b}	1 = Household identified as Hispanic and white; 0 = otherwise
Non-White Hispanic Household ^{a, b}	1 = Household identified as Hispanic and non-white; 0 = otherwise
First-time Owner	1 = First home owned by the household; 0 = otherwise
Monthly Housing Cost	Included are the costs of electricity, gas, other heating fuels, water and sewer, real estate taxes, property insurance, condominium fees, mobile home park fees, homeownership association fees, mortgage and home equity loan payments, other mortgage fees paid periodically, and routine maintenance
Housing Cost / Income >.33 ^{c, d}	1 = Monthly Housing Cost relative to monthly income is greater than 33 percent; 0 = otherwise
.22<Housing Cost / Income <=.33 ^{c, d}	1 = Monthly Housing Cost relative to monthly income is greater than 22 percent and less than 34 percent; 0 = otherwise
.16<Housing Cost / Income <=.22 ^{c, d}	1 = Monthly Housing Cost relative to monthly income is greater than 16 percent and less than 23 percent; 0 = otherwise
Housing Cost / Income <=.16 ^{c, d}	1 = Monthly Housing Cost relative to monthly income is less than or equal to 16 percent; 0 = otherwise
Property Characteristics	
Current House Value	Current House Value in ten thousand dollar units
Metropolitan Areas	Households in the sample came from 41 SMSAs in 3 interview periods (1998, 2002, 2004) discrete variables indicating the SMSA in which each housing unit was located were included in regression analyses.
	For a complete list of the SMSAs included in the analysis, see Appendix A

^a Because the American Housing Survey designates race and Hispanic ethnicity separately both white and non-white individuals can identify themselves as Hispanic. This split is represented in the categorization of Hispanics above.

^b Race of the spouse (or partner) was considered when identifying the race of the household. For mixed race couples, if either the head or spouse was Hispanic, the household was considered Hispanic, for other couples where one partner was black the household was considered to be black.

^c Break points represent the division of the distribution for the full sample into quartiles.

^d For a definition of what is included in monthly housing cost see the definition of that variable directly above.

In addition to household characteristics, several loan characteristics are included to control for differences in the risk associated with these loans. Specifically, loan term, whether the loan payment is fixed, whether the loan has private mortgage insurance (for conventional loans only), and (for recent movers only) a set of categorical variables that distinguish between various loan-to-value ratio levels are included in the analysis.²² Normally, one would expect that the longer the loan term the higher the interest rate would be based on inflationary risk and the risk associated with any deferral in the repayment of principal. Fixed-payment loans exclude all mortgage instruments where payments may vary (e.g., adjustable or graduated payment loans). Generally, we might consider fixed-payment fully-amortized loans to be lower risk than other types of so-called “alternative” mortgage instruments. The sign on private mortgage insurance might be expected to differ depending on whether measures of the loan-to-value ratio are included in the analysis. Private mortgage insurance is obtained to reduce the level of default risk on loans with higher loan-to-value ratios. When a measure of the loan-to-value ratio is included in the analysis mortgage insurance would be expected to have a negative sign. However, for conventional mortgages, where loan-to-value is not included, it might be expected to capture the higher risk associated with low down-payment loans and, therefore, have a positive sign. For recent movers, loan-to-value ratio is defined as a set of categorical variables in which break points occur at meaningful intervals in terms of risk differentiation. In particular, loans greater than 80 percent loan-to-value ratio typically are required to have private mortgage insurance, and loans greater than 100 percent represent loans whose principal balance is greater than the collateral value. Thus, loans in the lower loan-to-value categories would be expected to have lower interest rates.

Beyond the loan and household characteristics, the quality of the neighborhood and structural characteristics of the property (i.e., the quality of the collateral) might be expected to influence the riskiness of the loan. While numerous subjective measures of housing quality abound in the AHS, the best single measure of the quality of the collateral is property value. It is expected that higher property values will be associated with lower interest rates.²³

Finally, the AHS allows us to control for the year in which the loan was originated and, because we are employing the MSA sample, the market in which the loan was originated. Thus, we include a set

²² To estimate an LTV for the full sample we would need the house value at the time the loan was originated. This is not possible for refinancing since measures of property value are only available at the point of home purchase and at the point of the interview. For purchases it is conceptually possible since that (retrospective) variable is on the data set. However, this variable has, unfortunately, many missing values probably due to the nature of the retrospective question. These issues are not relevant for recent movers who purchase.

²³ Note that the proposed inverse relationship between property value and interest rates may be mitigated to some degree to the extent that higher valued properties have “jumbo” mortgages. Jumbo mortgages are considered non-conforming loans because their values exceed the loan limits set by Fannie Mae and Freddie Mac. As such, they are considered to be higher risk from the lenders perspective and, therefore have slightly higher interest rates than would an otherwise comparable conforming loan. Experimentation with a dummy variable for jumbo loans did not improve the fit of the model nor was this variable statistically significant.

of categorical variables for the year of origination, and the market in which the loan was originated.²⁴ While these coefficients and t-statistics are not included in the tables, to allow the results to be presented in a more concise and effective manner, they are highly significant in all the regressions and, as might be expected, account for a substantial amount of the variation in interest rate that are observed.²⁵ As noted in Table 5, the 41 SMSAs included in the analysis are listed in Appendix A.

As discussed above, this study recognizes the limitations of the AHS in the provision of interest rate analysis. Namely, that information on the net-wealth position and credit history of the sample households is not available, and that information on the institutions making the loan are not available, in particular their underwriting criteria. Thus, the regression analysis presented can make no definitive statement about whether or not discrimination exists. However, this investigation's combined regression/means tables can shed light in two primary areas:

- Does there appear to be a separate racial/ethnic affect after controlling for factors available in the AHS that might influence interest rates?
- Are there factors that differ across the racial/ethnic/income groups that appear to influence the interest rate a household pays for a given loan? For example, if Hispanics are less well educated than whites on average, do these differences matter, i.e., are they statistically significant factors in the interest rate regressions?

Home Purchase

Tables 6 and 7 present results for interest rates on home purchase loans through conventional markets for both the full sample and recent movers. Similarly, Tables 8 and 9 consider the FHA/VA markets for the same two groups of mortgagors. Both sample means and the regression results are presented in all four tables.

²⁴ Note, that the earlier in time a loan was originated, the fewer loans originated in that year are still in existence. Consequently, in earlier years the discrete variables included in the regressions may represent, for example, a five-year interval, e.g., 1965-70. In the case of recent movers, only the MSA categorical variables could be included because distinct MSAs were sampled in each year and, therefore, they were perfectly correlated with the origination periods.

²⁵ The R^2 s in all the regressions presented in the analysis are relatively high for disaggregated micro-data samples, ranging from about .22 (Table 13 for second mortgages) to .45 (Table 15 for home equity loans).

Table 6
Full Sample^a
First Mortgages – Conventional / Home Purchase

Variable Names	Regression Coefficients ^{b,c}	Means						
		Hispanic	Black	White	Hispanic	Black	White	
Interest Rate	na	7.38568	7.37048	7.08955	7.12884	7.29837	7.03914	
Intercept	6.50615 *	na	na	na	na	na	na	
Household Race								
Black Household	0.30565 *	0.00000	1.00000	0.00000	0.00000	1.00000	0.00000	
Non-White Hispanic Household	0.14621 *	0.35313	0.00000	0.00000	0.27734	0.00000	0.00000	
White Hispanic Household	0.09177 *	0.64688	0.00000	0.00000	0.72266	0.00000	0.00000	
Household Characteristics								
Single Female	-0.00595	0.21042	0.51810	0.36634	0.08259	0.20777	0.09481	
Single Male	0.07736 **	0.09688	0.16029	0.18462	0.06696	0.09992	0.10247	
Age 24 or less	-0.07429	0.03229	0.05067	0.03611	0.01228	0.01665	0.01034	
Age 45 - 61	0.03633	0.28021	0.34333	0.31217	0.34933	0.40285	0.39284	
Age 62 or more	-0.06316	0.14167	0.20476	0.25335	0.04743	0.06899	0.05861	
High School Grad.	-0.06094	0.25417	0.25750	0.27082	0.19364	0.19508	0.16376	
Post High School	-0.10632 *	0.22708	0.31127	0.32207	0.30971	0.31800	0.27083	
College Graduate	-0.23344 *	0.12292	0.20889	0.28946	0.37835	0.41079	0.52959	
Income/Household Size	0.00066	0.84848	1.22576	1.37065	2.91491	3.04984	3.56726	
Savings 20k or more	-0.08740	0.02292	0.01861	0.07338	0.01004	0.00634	0.02624	
First-time Owner	-0.06815 *	0.35104	0.30403	0.56494	0.56975	0.45044	0.68148	
.22<Housing Cost / Income <=.33	-0.12112 *	0.22188	0.25129	0.23646	0.27902	0.22125	0.24631	
.16<Housing Cost / Income <=.22	-0.17071 *	0.07708	0.08583	0.08212	0.27065	0.27042	0.28041	
Housing Cost / Income <=.16	-0.21923 *	0.03125	0.05274	0.05358	0.32757	0.42982	0.38288	
Loan Characteristics								
10 Year Loan Term	-0.26373 *	0.02917	0.01965	0.02213	0.01563	0.01190	0.01379	
15 Year Loan Term	-0.08616 *	0.10938	0.09721	0.12522	0.09989	0.06503	0.12335	
20 Year Loan Term	-0.12420 **	0.01875	0.04033	0.04485	0.02958	0.02538	0.03639	
25 Year Loan Term	0.15492	0.00625	0.02172	0.01747	0.00781	0.01665	0.01915	
Loan Payments Fixed	-0.11489 *	0.24479	0.35367	0.32091	0.22712	0.27914	0.23903	
Private Mortgage Insurance	0.21008 *	0.88854	0.77766	0.85149	0.93080	0.86598	0.93354	
Property Characteristics								
Current House Value	-0.00949 *	14.59536	10.98829	16.02168	21.47161	17.03789	22.40053	
Adjusted R²	0.2575							
Number of Observations	11918	960	967	1717	1792	1261	5221	

^a The sample includes all households who have a first mortgage loan.

^b *, **, and *** represent significance at the 1%, 5%, and 10% levels respectively.

^c All regressions include discrete variables indicating in which of 41 SMSAs the housing units were located, and the year in which the first mortgage was originated. For a complete list of the SMSAs see Appendix A.

Table 7
Recent Mover Sample ^a
First Mortgage – Conventional / Home Purchase

Variable Names	Regression Coefficients ^{b,c}	Means						
		Low-income			High-income			
		Hispanic	Black	White	Hispanic	Black	White	
Interest Rate	na	7.19865	6.81376	6.62636	6.89205	6.85220	6.69537	
Intercept	7.29703	na	na	na	na	na	na	
Household Race								
Black Household	0.20625 *	0.00000	1.00000	0.00000	0.00000	1.00000	0.00000	
Non-White Hispanic Household	0.14753 **	0.43983	0.00000	0.00000	0.28598	0.00000	0.00000	
White Hispanic Household	0.06353	0.56017	0.00000	0.00000	0.71402	0.00000	0.00000	
Household Characteristics								
Single Female	-0.04983	0.17842	0.48485	0.36512	0.08902	0.21277	0.08996	
Single Male	0.09302	0.10373	0.22727	0.19074	0.09470	0.09726	0.12444	
Age 24 or less	-0.14171	0.05809	0.09596	0.07357	0.03030	0.03040	0.01499	
Age 45 - 61	0.04850	0.20747	0.23232	0.23433	0.22727	0.28875	0.25787	
Age 62 or more	-0.06739	0.04979	0.09596	0.09537	0.02083	0.02128	0.02624	
High School Grad.	-0.12846	0.23237	0.18687	0.23978	0.20076	0.21277	0.14168	
Post High School	-0.16904 **	0.25726	0.35354	0.28610	0.30492	0.31307	0.26762	
College Graduate	-0.32766 *	0.14108	0.30303	0.38147	0.40341	0.41641	0.56822	
Income/Household Size	0.00180	0.87207	1.36439	1.47890	2.85650	3.19382	3.85890	
Savings 20k or more	0.01119	0.01660	0.02020	0.04087	0.00758	0.00000	0.01799	
First-time Owner	-0.08608 **	0.40664	0.33838	0.58311	0.59659	0.47112	0.73163	
.22<Housing Cost / Income <=.33	-0.11604 **	0.23651	0.27273	0.25341	0.28030	0.24316	0.24363	
.16<Housing Cost / Income <=.22	-0.20247 *	0.07469	0.10101	0.05995	0.29735	0.27964	0.32984	
Housing Cost / Income <=.16	-0.24972 *	0.03734	0.04545	0.05177	0.28030	0.37994	0.32759	
Loan Characteristics								
10 Year Loan Term	0.10420	0.00415	0.02525	0.00817	0.01136	0.00608	0.00600	
15 Year Loan Term	-0.15056 **	0.08299	0.08081	0.11989	0.07008	0.04863	0.10120	
20 Year Loan Term	0.00316	0.02075	0.04040	0.02997	0.01894	0.02128	0.02699	
25 Year Loan Term	-0.35288	0.00415	0.01515	0.01362	0.00379	0.00304	0.00450	
.9<Loan to Value<=1.0	-0.20040 ***	0.45228	0.38384	0.27520	0.35795	0.49240	0.26087	
.8<Loan to Value <=.9	-0.28043 **	0.12863	0.08081	0.11989	0.21212	0.12158	0.16567	
Loan to Value <=.8	-0.37618 *	0.37759	0.47475	0.58311	0.39773	0.35562	0.56147	
Loan Payments Fixed	-0.27142 *	0.19917	0.33838	0.28065	0.18939	0.26748	0.21364	
Private Mortgage Insurance	-0.02421	0.90871	0.79798	0.87738	0.95076	0.89970	0.95502	
Property Characteristics								
Current House Value	-0.00686 *	14.51983	12.03673	17.14565	23.08435	19.80033	25.28515	
Adjusted R²	0.3963							
Number of Observations	2997	241	198	367	528	329	1334	

^a The sample includes all households who have a first mortgage loan.

^b *, **, and *** represent significance at the 1%, 5%, and 10% levels respectively.

