



# **Mortgage Pricing Differentials Across Hispanic, Black, and White Households**

*Evidence from the American Housing  
Survey*

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*Evidence from the American Housing Survey*

*Prepared for*

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# 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

comparable white households. For example, in the market for second mortgages it is estimated that college graduates pay an average of 97.1 basis points less than those who did not graduate high school on the second mortgages that they have outstanding at the time of their interview. For low-income Hispanics, only 13.7 percent of household heads have a college degree. For African-Americans the rate is about 15.5 percent. In contrast, among white low-income household heads 24.2 percent fall in this category. The other variable that is consistently significant in these regressions, as it was in the first mortgage regressions, is current house value. Across the board, African-American households in this sample have lower house values than whites or Hispanics. However, the estimated impact of this variable on interest rates is not terribly large. For every \$10,000 in house value it is estimated that interest rates will change by 2.6 basis points in the market for second mortgages and 1.4 basis points in the home equity market.

## **Research Needs**

Thus, this analysis provides more information than was previously available about minority – particularly Hispanic – households' situation in the various mortgage markets in comparison to comparable white and black households. It suggests that more work needs to be conducted to determine the factors that cause the observed differences in mortgage rates between minority families and white families and between non-white and white Hispanics. It also suggests that by eliminating some fundamental differences between minority and white households, minorities may do better in achieving the lowest possible mortgage rates. Most notably, increases in the level of educational attainment by Hispanics and blacks should improve their ability to function in these financial markets.

Finally, this research represents only a first step in understanding mortgage pricing differentials across different income/ethnic groups. To fully investigate this issue, researchers need access to data that contains detailed information on the net-wealth and credit history of mortgagors as well as information on financial institutions and their underwriting criteria. Certainly, clear understanding of the way in which these credit markets work to produce differential outcomes for minority households is critical to designing policies that promote equal access to owner-occupied housing for all Americans.





# I. Introduction<sup>1</sup>

An important policy emphasis in recent years of the Department of Housing and Urban Development (HUD) has been to promote affordable housing homeownership and stronger communities. In developing the details of such programs, Secretary Alphonso Jackson acknowledged the increasing importance of the Hispanic-American population, particularly as a component of low-income households, whose housing options need improvement.<sup>2</sup> However, consistent with recognition of housing needs of low-income households and the Hispanic population is the concern of policymakers and housing analysts that differences in access to homeownership financing may be a critical barrier to reducing the homeownership gap between Hispanic families and their white counterparts.

Thus, more needs to be understood about the differences in the terms, conditions, and use of financing alternatives across ethnic groups. The analysis presented below employs recent metropolitan statistical area (MSA) samples of the American Housing Survey (AHS) to address these issues and see how financing factors differ for Hispanics as compared to other ethnic groups across a number of different housing markets.

Recently, several researchers have used the AHS to look at loan terms, although their analyses have focused on first mortgages using the national version of the AHS. In this respect, these analyses are more limited in scope than investigation developed in this paper. Our analysis utilizes a much larger sample of Hispanic homeowners, and the markets in which the loans are being originated can be identified, which is not true for the national AHS sample.<sup>3</sup> Also, by expanding the analysis to include junior mortgages and home equity loans, a much more complete picture of housing related finance can be developed. For example, according to the Federal Reserve, as of the second quarter of 2004, American homeowners owe \$766.2 billion dollars in home equity loans and lines of credit; more than twice as much as in 1998.<sup>4</sup> Also, one might anticipate that minorities could be more likely to obtain such financing from more costly sources including “predatory” lenders.

In addition to comparing overall debt levels, interest rates, and other loan characteristics across three major ethnic groups and income categorizations, for both traditional first mortgages and junior and home-equity loans, a basic regression analysis is conducted.<sup>5</sup> In particular, for each ethnic subgroup,

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<sup>1</sup> This study is part of a series of papers commissioned by HUD examining Hispanic homeownership. See Cortes et al. (2006) for references to the complete series of reports.

<sup>2</sup> This recognition has appeared in numerous HUD statements in recent years. For example, see the discussion of any recent proposed HUD budget such as that of 2005 (News Release No. 04-0101, 2004).

<sup>3</sup> For more details, see: Susin, Scott (2003), “Mortgage Interest Rates and Refinancing: Racial and Ethnic Patterns”, unpublished manuscript, U.S. Census Bureau; and Boehm, Thomas, Alan Schlottmann, and Paul Thistle, (2005), Rates and Race: An Analysis of Disparities in Mortgage Rates”, unpublished report, Fannie Mae Foundation

<sup>4</sup> See Andrew LePage (2005), “Americans Using Home Equity as ATM”, distributed by Scripps Howard News Service, <http://www.shns.com>

<sup>5</sup> Income levels are defined using HUD’s annual estimates of median household income, with low-income defined as being below 80 percent of the median. The three major ethnic classifications are black, Hispanic, and white.

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.<sup>6</sup> 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.<sup>7</sup> 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.<sup>8</sup> 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.

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

<sup>7</sup> 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.

<sup>8</sup> 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.

## II. Literature Review: A Brief Summary

Discussions of public policy about mortgage pricing have been handicapped by the relative lack of studies on rates that are charged for mortgages by race and by mortgage market segment. The existing literature on discrimination in mortgage markets has largely focused on discrimination and redlining in the mortgage approval process. Examples of this literature include Yinger (1996), Ross and Yinger (1996), and Ladd (1998). An extensive literature discussion appears in the book by Ross and Yinger (2002). Other studies have examined loan default rates (e.g., Berkovec, et. al., 1996, Cotterman, 2002, etc).

The small but growing literature that analyzes mortgage rates using recent data includes Courchane and Nickerson (1997), Crawford and Rosenblatt (1999), Nothaft and Perry (2001), Black, Boehm and DeGennaro (2003), and Susin (2003).<sup>9</sup> Courchane and Nickerson report the results from three examinations by the Office of the Comptroller of the Currency. They conclude that differences in rates may be due to discrimination, to lenders' market power, or to legal restrictions on lenders. Crawford and Rosenblatt examine lending by a single national mortgage lender for the period 1988-1989. They conclude that conventional loan rates are race-neutral. Due to data limitations, neither of these studies employs a representative national sample or analyzes refinanced loans in any detail. Nothaft and Perry, using data from the Mortgage Interest Rate Survey for 1993-1996, analyze neighborhood effects. They find that rates are slightly higher in predominantly Hispanic neighborhoods, but may be slightly lower in predominantly black neighborhoods. Black, Boehm and DeGennaro (2003) analyze overages for purchase and refinance loans for a single national mortgage lender in 1996.<sup>10</sup> They conclude that the differences in overages are due to market power and differential bargaining skill.

In a pioneering study based upon the AHS, Susin (2003) uses data from the national American Housing Survey for 2001. He employs a sample of all homeowners who have mortgages (12,524 households) to look at interest rates as a function of several household characteristics (race/ethnicity, house value, education, age, and a wealth proxy (dividend income)), mortgage characteristics, and neighborhood characteristics (the poverty rate and the percent black and Hispanic in Census tracts in which the households reside<sup>11</sup>). In addition, an interest rate index (the 10-year Treasury bond rate) was used to control for differences in interest rates at the time the home was originally purchased. Susin's analysis suggests that blacks pay an average of 44 basis points more than whites, although the differential appears to be smaller for more recent mortgages. Susin's analysis suggests that most of the black-white differential is due to the difference in blacks' refinancing behavior; the rate differential is larger for blacks who refinance. Susin also finds that Hispanics pay an average of 23 basis points more than whites and that most of the differential is due to neighborhood effects.

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<sup>9</sup> Earlier studies of mortgage rates include Schaefer and Ladd (1981), Black and Schweitzer (1985) and Benston and Horsky (1991).

<sup>10</sup> Overage, also referred to as a yield spread premium, refers to the difference between the mortgage interest rate charged and the minimum rate the lender would accept as identified by a rate sheet.

<sup>11</sup> Census tract information is not normally available with the AHS data released to researchers. However, because the author was employed by the U.S. Census department at the time of the study this information could be made available to him.

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.

### III. The Data

As already suggested, the data presented and discussed below is from recent American Housing Survey (AHS) samples that are specific for MSA's. Information is gathered for samples of approximately 5,000 households in each MSA. Approximately 14 MSA's are selected for each sampling year.<sup>12</sup> The most recently available MSA's are for the sampling years 1998, 2002, and 2004 with information from all 41 of the MSAs covered by these surveys combined for this analysis.<sup>13</sup>

There are two primary reasons for using the MSA samples as opposed to the national version of the dataset. First, of the almost 50,000 units included in the national sample, only about 4,000 are occupied by Hispanic families and slightly less than half of these are owner-occupants. In contrast, pooling the MSA samples for 41 markets yields a total sample size of nearly 200,000 observations, including over 5,000 Hispanic households with first mortgages.<sup>14</sup> In addition, by using the MSA samples we can identify the specific market in which housing decisions are being made.

For first mortgages, information is presented across several loan types. Specifically, the markets for home purchase versus refinance loans and conventional versus government (FHA/VA) loans are generally considered to be different enough that they need to be stratified into four separate submarkets for the purpose of analysis. In addition for each submarket, the home purchase loans of recent movers will be considered separately from all households. Each sample provides a somewhat different perspective. Recent movers who choose homeownership and finance their home purchase with a first mortgage provide insight into current mortgage conditions across race and income category for those households who have just negotiated a mortgage in the market. Alternatively, the full sample of current homeowners provides a view of the debt situation of all households whose current circumstances may be viewed as the result of financing decisions made over a substantially longer period of time. As mentioned earlier, in addition to first mortgages, the AHS data permits the investigation of other debt secured by home equity (junior mortgages and home equity loans).<sup>15</sup>

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<sup>12</sup> The majority of these MSAs are also re-sampled periodically.

<sup>13</sup> The MSAs included in the sample are: for 1998 – Baltimore MD, Birmingham AL, Boston MA, Cincinnati OH, Houston TX, Minneapolis MN, Norfolk/Newport News VA, Oakland CA, Providence RI, Rochester NY, Salt Lake City UT, San Francisco CA, San Jose CA, Tampa FL, and Washington DC; for 2002 – Anaheim-Santa Ana CA, Buffalo NY, Charlotte NC-SC, Columbus OH, Dallas TX, Fort Worth-Arlington TX, Kansas City MO-KS, Miami-Ft. Lauderdale FL, Milwaukee WI, Phoenix AZ, Portland OR-WA, Riverside-San Bernardino-Ontario CA, San Diego CA. For 2004, the MSA's include Memphis, Pittsburgh, Atlanta, Hartford, New Orleans, San Antonio, Cleveland, Indianapolis, Denver, Oklahoma City, St. Louis, Sacramento, and Seattle-Everett.

<sup>14</sup> Because of the large numbers of white households in the sample assembled in this way a random sub-sample of these households for first mortgages was selected to make the analysis more tractable.

<sup>15</sup> While the AHS separates loans other than first mortgages into junior mortgages, i.e., 2<sup>nd</sup> and 3<sup>rd</sup> mortgages (note, there are only a few 3<sup>rd</sup> mortgages) and home equity loans, the characteristics that distinguish these loans from one another are not completely clear. In the event of default, junior mortgages are clearly in a subordinate position to more senior liens, which is not necessarily true of a home equity loan. Also, home equity loans include lines-of-credit which do not require that regular payments be made to amortize the loan and whose term is indeterminate and may be kept alive as long as the household resides in the

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).<sup>16</sup> 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.

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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.

<sup>16</sup> 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<sup>a</sup>**

	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%

<sup>a</sup> Data includes both Home Purchase Loans and Refinancings





## IV. First Mortgages

As a starting point for this discussion, information on mortgagors and mean characteristics for first mortgages for both the full and recent mover samples are presented in Table 2 and 3. Each of these tables will be discussed in turn.<sup>17</sup>

Table 2 provides the financial characteristics of households and their loans. Both home purchase and refinanced loans are included in the data used to construct this table. Perhaps the most striking data shown in Table 2 is housing costs relative to income (the ratio “housing cost/income” in the middle section of Table 2). As shown, the relative housing burden by low-income households to service their mortgage and related costs is quite high. Low-income Hispanic households have the highest ratio of all with 67 percent of first mortgagors having a ratio that exceeds 32 percent. But the shares are high for other owners as well: 62 percent of blacks and 61 percent of white low-income households have housing costs that exceed 32 percent of their income.<sup>18</sup> It is also particularly interesting to note that the interest rate differential between Hispanic first mortgagors and low-income white households is higher in Table 2 for low-income households than for those with higher income (a similar differential exists between black and white households). In general, white households have the lowest interest rates with black households the highest interest rates within each income group.

Table 3 provides comparable information for households that are recent movers in the AHS surveys. There are several interesting differences between recent movers and the full sample. As shown in Table 3, recent movers have interest rates on first mortgages that are lower compared to the full sample of households (in Table 2). The differential is greatest for black households (for example, 6.78 percent for low-income black households that are recent movers compared to 7.39 percent for blacks in the full sample).<sup>19</sup> In addition, the loan-to-value ratios (LTV) of recent movers are

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<sup>17</sup> The sample was constrained to include only mortgages made by a financial institution (not a relative, seller, or some other unusual source). The mortgage had to be made for a residence only (not in part for a business or other buildings on the property). It was not made on a condominium or a manufactured house (these were a very small fraction of the total, less than 5%) and the loan was not an assumption or a wraparound loan (it was a newly originated loan when the borrower got it). In addition, for the first mortgage analysis these loans were constrained so that the loan terms were either: 10, 15, 20, 25, or 30 years. As one might expect, the sample still accounted for 95 percent of the loans in the sample. The motivation for the loan term restriction is that it allows us to include discrete dummy variables for the different loan terms above (a better way generally to capture the fundamental differences in these different loans) and gives us true long-term financing (i.e., a 3 year term is not typically for the same purpose of long-term financing, or it could be a 30 year loan with a mistake entering the data).

<sup>18</sup> The breakpoints in the categorization of housing cost were obtained by cutting the distribution of housing cost to income for the full sample into quartiles. However, particularly for pretax income, devoting 30 percent of income to housing expenses would be considered quite high.

<sup>19</sup> This differential reflects relatively recent reductions in interest rates compared to previous levels.

**Table 2**  
**Means**  
**All 1st Mortgages<sup>a</sup>**

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

<sup>a</sup> 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**

Sample	Loan		Household Type					
			Low Income			High Income		
	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.<sup>20</sup> 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.<sup>21</sup> 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.

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<sup>20</sup> 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.

<sup>21</sup> 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
<b>Loan Characteristics</b>	
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.
<b>Household Characteristics</b>	
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**

<b>Variable Name</b>	<b>Variable Definition</b>
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 <sup>a, b</sup>	1 = Household's race designated to be white; 0 = otherwise
Black Household <sup>a, b</sup>	1 = Household's race designated to be black; 0 = otherwise
White Hispanic Household <sup>a, b</sup>	1 = Household identified as Hispanic and white; 0 = otherwise
Non-White Hispanic Household <sup>a, b</sup>	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 <sup>c, d</sup>	1 = Monthly Housing Cost relative to monthly income is greater than 33 percent; 0 = otherwise
.22<Housing Cost / Income <=.33 <sup>c, d</sup>	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 <sup>c, d</sup>	1 = Monthly Housing Cost relative to monthly income is greater than 16 percent and less than 23 percent; 0 = otherwise
Housing Cost / Income <=.16 <sup>c, d</sup>	1 = Monthly Housing Cost relative to monthly income is less than or equal to than 16 percent; 0 = otherwise
<b>Property Characteristics</b>	
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

<sup>a</sup> 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.

<sup>b</sup> 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 consider Hispanic, for other couples where one partner was black the household was considered to be black.

<sup>c</sup> Break points represent the division of the distribution for the full sample into quartiles.

<sup>d</sup> 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.<sup>22</sup> 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.<sup>23</sup>

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

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<sup>22</sup> 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.

<sup>23</sup> 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.<sup>24</sup> 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.<sup>25</sup> 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.

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<sup>24</sup> 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.

<sup>25</sup> 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<sup>a</sup>**  
**First Mortgages – Conventional / Home Purchase**

Variable Names	Regression Coefficients <sup>b,c</sup>	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	
<b>Household Race</b>								
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	
<b>Household Characteristics</b>								
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	
<b>Loan Characteristics</b>								
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	
<b>Property Characteristics</b>								
Current House Value	-0.00949 *	14.59536	10.98829	16.02168	21.47161	17.03789	22.40053	
<b>Adjusted R<sup>2</sup></b>	0.2575							
<b>Number of Observations</b>	11918	960	967	1717	1792	1261	5221	

<sup>a</sup> The sample includes all households who have a first mortgage loan.

<sup>b</sup> \*, \*\*, and \*\*\* represent significance at the 1%, 5%, and 10% levels respectively.

<sup>c</sup> 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 <sup>a</sup>**  
**First Mortgage – Conventional / Home Purchase**

Variable Names	Regression Coefficients <sup>b,c</sup>	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	
<b>Household Race</b>								
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	
<b>Household Characteristics</b>								
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	
<b>Loan Characteristics</b>								
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	
<b>Property Characteristics</b>								
Current House Value	-0.00686 *	14.51983	12.03673	17.14565	23.08435	19.80033	25.28515	
<b>Adjusted R<sup>2</sup></b>	0.3963							
<b>Number of Observations</b>	2997	241	198	367	528	329	1334	

<sup>a</sup> The sample includes all households who have a first mortgage loan.

<sup>b</sup> \*, \*\*, and \*\*\* represent significance at the 1%, 5%, and 10% levels respectively.

<sup>c</sup> 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 8**  
**Full Sample <sup>a</sup>**  
**First Mortgages – FHA-VA / Home Purchases**

Variable Names	Regression Coefficients <sup>b,c</sup>	Means						
		Low-income			High-income			
		Hispanic	Black	White	Hispanic	Black	White	
Interest Rate	na	7.45379	7.40982	7.19988	7.22314	7.38361	7.26889	
Intercept	6.96243 *	na	na	na	na	na	na	
<b>Household Race</b>								
Black Household	0.14791 *	0.00000	1.00000	0.00000	0.00000	1.00000	0.00000	
Non-White Hispanic Household	0.06765	0.40404	0.00000	0.00000	0.35192	0.00000	0.00000	
White Hispanic Household	0.06274	0.59596	0.00000	0.00000	0.64808	0.00000	0.00000	
<b>Household Characteristics</b>								
Single Female	-0.00873	0.23030	0.52196	0.31696	0.08246	0.17421	0.09572	
Single Male	-0.04552	0.11313	0.15809	0.22187	0.09175	0.10630	0.12091	
Age 24 or less	0.08823	0.03838	0.01757	0.03328	0.01858	0.00787	0.01259	
Age 45 - 61	0.08786 *	0.24444	0.34128	0.27575	0.27875	0.40059	0.31927	
Age 62 or more	-0.07417	0.09091	0.13802	0.11727	0.02787	0.03937	0.03904	
High School Grad.	-0.12947 **	0.29293	0.25721	0.30269	0.23926	0.23130	0.23678	
Post High School	-0.11004 **	0.26869	0.39147	0.38669	0.38560	0.39469	0.35516	
College Graduate	-0.15405 *	0.07879	0.18444	0.21236	0.21719	0.29921	0.36524	
Income/Household Size	0.00001	0.86657	1.29547	1.44098	2.22893	2.44053	2.83088	
Savings 20k or more	-0.16708	0.00606	0.01380	0.03645	0.00348	0.00197	0.01511	
First-time Owner	0.01030	0.25253	0.22836	0.38035	0.37631	0.35925	0.50378	
.22<Housing Cost / Income =.33	-0.12765 *	0.27273	0.28984	0.34390	0.31243	0.22638	0.24937	
.16<Housing Cost / Income =.22	-0.16061 *	0.07273	0.08908	0.10618	0.31591	0.33858	0.32746	
Housing Cost / Income <=.16	-0.20876 *	0.02020	0.02133	0.03170	0.28571	0.37402	0.35579	
<b>Loan Characteristics</b>								
10 Year Loan Term	0.54419 **	0.00404	0.00125	0.00792	0.00348	0.00098	0.00189	
15 Year Loan Term	-0.13764 ***	0.03838	0.04391	0.04279	0.03136	0.03839	0.05164	
20 Year Loan Term	-0.17783	0.01818	0.02635	0.01426	0.01626	0.01969	0.01196	
25 Year Loan Term	-0.08999	0.00404	0.01882	0.01109	0.00813	0.00689	0.00819	
Loan Payments Fixed	-0.11800 *	0.19192	0.24592	0.28051	0.19744	0.22047	0.22796	
Current House Value	-0.01926 *	11.69912	9.72548	11.48391	14.97329	12.26612	14.92562	
<b>Adjusted R<sup>2</sup></b>	0.2913							
<b>Number of Observations</b>	5388	495	797	631	861	1016	1588	

<sup>a</sup> The sample includes all households who have a first mortgage loan.

<sup>b</sup> \*, \*\*, and \*\*\* represent significance at the 1%, 5%, and 10% levels respectively.

<sup>c</sup> 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 9**  
**Recent Mover <sup>a</sup>**  
**First Mortgages – FHA / VA – Home Purchases**

Variable Names	Regression Coefficients <sup>b,c</sup>	Means						
		Low-income			High-income			
		Hispanic	Black	White	Hispanic	Black	White	
Interest Rate	na	7.21160	6.73110	6.70242	6.82580	6.86255	6.80282	
Intercept	7.29264	na	na	na		na	na	
<b>Household Race</b>								
Black Household	0.09910	0.00000	1.00000	0.00000	0.00000	1.00000	0.00000	
Non-White Hispanic Household	0.12381	0.45752	0.00000	0.00000	0.41365	0.00000	0.00000	
White Hispanic Household	0.05543	0.54248	0.00000	0.00000	0.58635	0.00000	0.00000	
<b>Household Characteristics</b>					na			
Single Female	-0.07690	0.15033	0.54070	0.29677	0.09639	0.15584	0.11549	
Single Male	-0.04041	0.11765	0.15698	0.25161	0.11245	0.14719	0.17323	
Age 24 or less	-0.00542	0.10458	0.04070	0.07742	0.04016	0.01732	0.03150	
Age 45 - 61	0.00819	0.14379	0.20349	0.16129	0.17269	0.23377	0.20997	
Age 62 or more	0.03368	0.04575	0.05233	0.04516	0.01205	0.02597	0.01837	
High School Grad.	-0.16834	***	0.30719	0.21512	0.22892	0.19481	0.19948	
Post High School	-0.07405		0.30719	0.40116	0.41365	0.40693	0.35696	
College Graduate	-0.19007	**	0.05882	0.26163	0.22892	0.34632	0.40420	
Income/Household Size	-0.00773		0.87220	1.43446	2.17557	2.44391	3.05117	
Savings 20k or more	-0.33871		0.00654	0.01163	0.00402	0.00000	0.01312	
<b>Loan Characteristics</b>								
10 Year Loan Term	-0.11575		0.00654	0.00000	0.00000	0.00433	0.00000	
15 Year Loan Term	0.00647		0.01961	0.05814	0.01205	0.03030	0.02625	
20 Year Loan Term	0.00437		0.01307	0.03488	0.02410	0.02597	0.01312	
25 Year Loan Term	-0.08973		0.00000	0.00581	0.00803	0.00000	0.00000	
Current House Value	-0.01746	*	11.92007	10.65694	16.19525	14.59677	16.21859	
First-time Owner	0.02142		0.23529	0.23256	0.40562	0.43290	0.52231	
.22<Housing Cost / Income <=.33	-0.05458		0.30719	0.30814	0.29719	0.23377	0.25459	
.16<Housing Cost / Income <=.22	-0.09202		0.06536	0.12209	0.33735	0.38961	0.37008	
Housing Cost / Income <=.16	-0.08656		0.00654	0.02907	0.23293	0.29004	0.29921	
.9<Loan to Value<=1.0	-0.08078		0.75163	0.67442	0.71486	0.69264	0.67979	
.8<Loan to Value <=.9	-0.26382	**	0.09150	0.06977	0.07229	0.06494	0.06562	
Loan to Value <=.8	-0.04048		0.15033	0.19767	0.15663	0.18182	0.22572	
Loan Payments Fixed	-0.41250	*	0.16993	0.20930	0.14056	0.18182	0.20472	
<b>Adjusted R<sup>2</sup></b>	0.4016							
<b>Number of Observations</b>	1341		153	172	155	231	381	

<sup>a</sup> The sample includes all households who have a first mortgage loan.

<sup>b</sup> \*, \*\*, and \*\*\* represent significance at the 1%, 5%, and 10% levels respectively.

<sup>c</sup> 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.





The regression coefficients for the different race/ethnicity categories indicate the extent to which these groups face higher interest rates than whites, *ceteris paribus*. For the full sample, black households appear to pay higher interest rates on first mortgages in both the conventional and FHA/VA markets as compared to other households. Recent movers who are black also pay significantly higher rates in the conventional market, but not in the government sector. Both non-white and white Hispanics pay significantly higher rates in the conventional market than whites (14.6 and 9.2 basis points respectively), but not as much higher as blacks (30.6 basis points). For recent movers, only non-white Hispanics pay significantly more than their white counterparts, 14.7 basis points, approximately the same differential we observe for the full sample. In contrast to the conventional market, in the FHA/VA market Hispanic rates are not significantly different than whites. Indeed, if one considers these results for minorities as a whole it appears that, controlling for other factors, they are much more likely to experience significantly higher rates than whites in conventional markets than in the government sector.

Turning to the consideration of other factors in these regressions, higher levels of education tend to be associated with lower interest rates across all markets. However, the effects appear to be stronger in the conventional market. Given the correlation between higher levels of education and household wealth and the assumed better understanding of financial markets, this is certainly an anticipated result. However, this result matters given the lower levels of education of Hispanic households. For example, the proportion of college graduates among low-income Hispanic households is less than half the corresponding figure for white households with conventional mortgages in the full sample—approximately 12.3 percent as compared to 28.9 percent, respectively. For FHA/VA loans for the full sample the difference is more pronounced, as only 7.8 percent of Hispanic household heads are college graduates, whereas 21.2 percent of whites have gotten a bachelors degree or more. The results are similar for recent movers. Similarly, across ethnic groups, high-income households have significantly higher levels of college graduates than corresponding low-income households. In general, while black households are not as highly educated as whites they have higher proportions of households in which the head is in a higher education category than their Hispanic counterparts. For example, considering the full sample and focusing on low-income families, in the conventional market 20.9 percent of African-American families are college graduates and 18.4 percent have achieved this level of education in the FHA/VA market. For recent movers, the percentage of black college graduates is very close to that of whites and substantially higher than comparable Hispanics.

Another set of variables that are generally highly significant with the expected sign are the housing-cost-to-income categorical variables and, for the recent mover sample, the loan-to-value categorical variable. As hypothesized earlier, these variables are included as measures of default risk. The only instance in which the housing-cost-to-income variables are not significantly correlated with interest rate differences (although they do have the expected sign) is in the government sector for recent movers. This difference seems reasonable since lenders are largely insulated against default risk in the FHA/VA market. While the proportions in each of the housing-cost-to-income categories do not differ substantially across white and minority households, for recent movers in the conventional market, a substantially higher proportion of minority households are in the highest loan-to-value categories. Specifically, for low-income families, 49.4 percent of Hispanic families and 44.4 percent of black families have more than a 90 percent loan-to-value ratio at loan origination. For comparable whites this figure is only 29.7 percent. For higher-income families, the percentage of African-Americans with an LTV greater than 90 percent is substantially higher than either of the two other

others at 53.3 percent; Hispanics and whites are 39.0 percent and 27.3 percent, respectively. This suggests that minority groups in our sample are also paying more in interest because of the extent of their mortgage debt with respect to both their ability to pay and the value of the properties acting as collateral for these loans.

One other variable that is statistically significant with the expected sign is house value. While Hispanics house values are relatively comparable to those of the white households in the home purchase samples, the current house values for African-Americans are consistently lower for both the high- and low-income sub-samples. For example, 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.<sup>26</sup> This suggests that African-Americans in particular may face higher interest rates to a certain degree because of the quality of their owned units.

## Refinance Loans

Tables 10 and 11 present results for interest rates on refinanced loans in the conventional and government sectors, respectively. Because it is highly unlikely that a recent mover household would be refinancing, after their move but prior to their interview, this analysis is only done for the full sample of homeowners who have refinanced. In particular, refinanced loans are identified as any loan that was originated in a more recent year than the year of purchase. Refinancing is much less likely to be done in the FHA/VA market than the conventional market, 5,366 versus 1,089 respectively. It is not hard to understand why this might be the case since FHA/VA loans are generally more costly than a comparable conventional loan. Since refinancing by definition occurs after some time has passed since the home was purchased, the combination of appreciation in house values and some loan amortization increase the borrowers opportunity to choose a conventional loan upon refinancing. Another interesting dimension of the data becomes evident when one considers the proportions of refinanced loans in this sample as compared to home purchase loans. Minorities appear less likely to refinance than comparable whites.<sup>27</sup> This result is more pronounced for low-income households, particularly those that are black. For example, in the conventional market for the full sample approximately 29.69 percent of the outstanding first mortgages are refinances (725 / 2442), while for Hispanics this percentage is 22.77 percent and for blacks it is 22.45 percent. For the FHA/VA market, among white households 15.75 percent have refinanced. The proportion of Hispanic FHA/VA borrowers that refinanced is not substantially different at 14.4 percent, but only 8.75 percent of African-Americans refinanced. These numbers are consistent with the belief that minority households, especially blacks, are less likely to refinance than comparable white households.

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<sup>26</sup> Note, that this is the only instance in which the average house value for Hispanics and whites appear markedly different.

<sup>27</sup> This result is consistent with the literature. Canner, Dynan, and Passmore (2002) find that minorities are less likely to refinance, and when they do the average amount of cash taken out is lower than whites. The Office of Policy Development and Research at the Department of Housing and Urban Development in a report titled “An Analysis of Mortgage Refinancing, 2001-2003” (2004) look at refinancing using recent HMDA data. The report considers mortgage refinance by racial/ethnic group and shows that the percentage of refinanced loans is relatively small in comparison to white households (e.g., in 2002, 65.5 percent of all refinanced loans were identified as being made by white households, whereas African Americans and Hispanics accounted for only 3.8 percent and 4.9 percent, respectively).

**Table 10**  
**Full Sample <sup>a</sup>**  
**First Mortgages – Conventional / Refinance**

Variable Names	Regression Coefficients <sup>b,c</sup>		Means					
			Low-income			High-income		
			Hispanic	Black	White	Hispanic	Black	White
Interest Rate	na		6.90415	7.49018	6.62328	6.49370	6.78913	6.42712
Intercept	6.77508		na	na	na	na	na	na
<b>Household Race</b>								
Black Household	0.41196	*	0.00000	1.00000	0.00000	0.00000	1.00000	0.00000
Non-White Hispanic Household	0.12786	***	0.25442	0.00000	0.00000	0.20151	0.00000	0.00000
White Hispanic Household	0.03112		0.74558	0.00000	0.00000	0.79849	0.00000	0.00000
<b>Household Characteristics</b>								
Single Female	0.00325		0.16961	0.51429	0.37103	0.06675	0.22188	0.09002
Single Male	-0.01350		0.15901	0.13214	0.15172	0.05793	0.10638	0.08799
Age 24 or less	-0.39055	***	0.01767	0.00714	0.00690	0.00882	0.00000	0.00237
Age 45 - 61	0.08971	*	0.36749	0.40357	0.41793	0.40050	0.50152	0.51743
Age 62 or more	0.04391		0.19788	0.33929	0.24552	0.06297	0.14590	0.07174
High School Grad.	0.01194		0.26148	0.26429	0.23586	0.17884	0.16717	0.15601
Post High School	-0.06829		0.30389	0.24643	0.36138	0.31864	0.31003	0.28663
College Graduate	-0.14865	**	0.13074	0.20000	0.31448	0.40932	0.43769	0.53029
Income/Household Size	0.00450		1.09417	1.17046	1.52272	3.12867	3.49322	3.78808
Savings 20k or more	-0.10242		0.02120	0.03929	0.07862	0.00252	0.00000	0.00880
First-time Owner	-0.11036	*	0.39576	0.32500	0.58207	0.59068	0.51368	0.70491
.22<Housing Cost / Income <=.33	-0.14693	*	0.21201	0.22857	0.25517	0.28967	0.21884	0.22369
.16<Housing Cost / Income <=.22	-0.30723	*	0.02473	0.07500	0.08690	0.26574	0.29483	0.29306
Housing Cost / Income <=.16	-0.38467	*	0.03180	0.01786	0.02759	0.33879	0.39514	0.40440
<b>Loan Characteristics</b>								
10 Year Loan Term	-0.38293	*	0.02473	0.05714	0.02483	0.01637	0.02736	0.03756
15 Year Loan Term	-0.39109	*	0.28975	0.18571	0.25517	0.28338	0.28571	0.33469
20 Year Loan Term	-0.12932	**	0.03180	0.04643	0.06207	0.05164	0.04255	0.05821
25 Year Loan Term	0.02597		0.01060	0.02500	0.01379	0.01134	0.01824	0.01523
Loan Payments Fixed	-0.16726	*	0.15194	0.21429	0.19448	0.12217	0.18237	0.13232
Private Mortgage Insurance	0.23012		0.96466	0.92500	0.95586	0.99118	0.95441	0.99323
<b>Property Characteristics</b>								
Current House Value	-0.00857	*	19.02732	12.17491	19.57272	26.34839	18.57597	25.46101
<b>Adjusted R<sup>2</sup></b>	0.4086							
<b>Number of Observations</b>	5366		283	280	725	794	329	2955

<sup>a</sup> The sample includes all households who have a first mortgage loan.  
<sup>b</sup> \*, \*\*, and \*\*\* represent significance at the 1%, 5%, and 10% levels respectively.

<sup>c</sup> 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 11**  
**Full Sample <sup>a</sup>**  
**First Mortgages – FHA/VA - Refinance**

Variable Names	Regression Coefficients <sup>b,c</sup>		Means						
			Low-income			High-income			
			Hispanic	Black	White		Hispanic	Black	White
Interest Rate			6.83283	7.03378	6.54025		6.63855	6.67197	6.59922
Intercept	7.23833		na	na	na	na	na	na	na
<b>Household Race</b>									
Black Household	0.13966		0.00000	1.00000	0.00000		0.00000	1.00000	0.00000
Non-White Hispanic Household	0.16889		0.24096	0.00000	0.00000		0.26601	0.00000	0.00000
White Hispanic Household	0.10371		0.75904	0.00000	0.00000		0.73399	0.00000	0.00000
<b>Household Characteristics</b>									
Single Female	0.17377	***	0.28916	0.50000	0.39831		0.06897	0.16970	0.11883
Single Male	-0.00254		0.09639	0.13514	0.11017		0.09360	0.11515	0.09417
Age 24 or less	-1.08716	***	0.00000	0.00000	0.00847		0.00493	0.00606	0.00224
Age 45 - 61	0.02559		0.22892	0.37838	0.33898		0.45320	0.50303	0.45516
Age 62 or more	-0.03795		0.24096	0.28378	0.21186		0.04433	0.09697	0.07175
High School Grad.	0.00645		0.19277	0.21622	0.27966		0.15764	0.15758	0.24215
Post High School	-0.20464		0.32530	0.28378	0.37288		0.42857	0.40606	0.37892
College Graduate	-0.26914	***	0.10843	0.31081	0.27119		0.29064	0.37576	0.34978
Income/Household Size	-0.00876		1.05962	1.19023	1.39742		2.57311	2.87956	3.45887
Savings 20k or more	-0.45330		0.01205	0.01351	0.05932		0.00000	0.00000	0.00897
First-time Owner	-0.09081		0.25301	0.27027	0.57627		0.53202	0.45455	0.59865
.22<Housing Cost / Income <=.33	-0.15784		0.32530	0.22973	0.24576		0.27586	0.24848	0.23094
.16<Housing Cost / Income <=.22	-0.23200	**	0.02410	0.08108	0.08475		0.28571	0.33333	0.30045
Housing Cost / Income <=.16	-0.35448	*	0.01205	0.04054	0.02542		0.37438	0.34545	0.39910
<b>Loan Characteristics</b>									
10 Year Loan Term	-0.35254		0.00000	0.01351	0.00000		0.01970	0.01212	0.01570
15 Year Loan Term	-0.12519		0.15663	0.14865	0.17797		0.24631	0.18182	0.29821
20 Year Loan Term	-0.00280		0.02410	0.10811	0.06780		0.02463	0.04848	0.04036
25 Year Loan Term	-0.09150		0.01205	0.00000	0.02542		0.01970	0.02424	0.01345
Loan Payments Fixed	-0.12616		0.13253	0.18919	0.22034		0.08374	0.14545	0.14350
<b>Property Characteristics</b>									
Current House Value	-0.00423		15.32506	10.90693	14.95164		18.37806	15.10242	19.33909
<b>Adjusted R<sup>2</sup></b>	0.3261								
<b>Number of Observations</b>	1089		83	74	118		203	165	446

<sup>a</sup> The sample includes all households who have a first mortgage loan.

<sup>b</sup> \*, \*\*, and \*\*\* represent significance at the 1%, 5%, and 10% levels respectively.

<sup>c</sup> 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.

A point of particular interest in these tables is related to the FHA/VA market. As shown in Table 11, this is the only market segment in which there is no separate impact, or interest rate differential, among households by racial/ethnic group. Put another way, on average, neither Hispanic nor black households pay significantly higher rates than white households controlling for the effects of the other variables that can be held constant. There could be a number of explanations for this result, but the lack of significant differences across racial/ethnic groups does not have to do with the act of refinancing per se. In the conventional refinance market, *ceteris paribus*, blacks and (to a lesser extent) non-white Hispanics refinance at significantly higher cost. In this market, interest rates are 41.2 and 12.8 basis points higher for each subgroup, respectively.

As was the case for home purchases, the regression coefficients suggest that households in which the head has a college education have lower rates. Considering the different racial groups, both black and Hispanic families have a smaller proportion of college-educated heads compared to comparable whites. In particular, considering the conventional market only 13.1 percent of Hispanic households have a college degree, for African-Americans this figure is 20.0 percent, while 31.4 percent of white household heads have a college degree or more. However, in general education appears to be less important for refinancing than is the case for home purchase since only college graduates are observed to have significantly different interest rates than the rates obtained by those who did not finish high school. Because those who refinance loans represent a subset of the population who might be expected to have developed a certain level of expertise from prior experience, we might expect the households who refinance to obtain better interest rates regardless of their education. However, this effect may be offset by the greater prevalence of subprime loans in the refinance market, which have generally higher interest rates. The diminished impact of education levels of interest rates may reflect the fact that poor credit—and hence subprime loans—is generally more common among all owners with less than a college education.

It is interesting to note that in the FHA/VA sample fewer of the risk related control variables are significant, as compared to the conventional refinancing market. This is to be expected since FHA and VA insurance and guarantees offer virtually 100-percent protection to lenders against default risk. In any event, in the conventional market for refinancing, higher housing-cost-to-income ratios, longer loan terms, and lower house values each give rise to higher interest charges. As with home purchases, one area where the black households in the sample appear to be at a disadvantage relative to Hispanics or whites has to do with the value of their housing units. In particular, in the conventional market, low-income blacks who refinance have an average current house value of approximately \$121,749, while the average value for both Hispanics and whites exceeds \$190,000.

## V. Junior Mortgages and Home Equity Loans

In general, unlike the AHS, most publicly available data sets do not allow for an investigation of the types of debt that are not traditional first mortgages, but are still secured by home equity. So-called junior mortgages, that is, mortgages that are subordinate to a first mortgage in the event of default and foreclosure, can be identified using the AHS. In addition, information on home equity loans, including lines of credit, is recorded separately from junior and first mortgages in the more recent versions of the AHS. Such loans are becoming an ever more popular way of accessing home equity. These types of loans are explored in Table 12 through Table 15. For this sample, junior mortgages and home equity loans represent a relatively small portion of homeowners. Comparing the sample sizes for these loans in Tables 12 and 14 to the sample sizes shown earlier for households that have first mortgages (Table 2), the largest percentage of owners with home equity loans, 14.6 percent, is for high-income white households (1,493 / 10,210). Minorities appear to be slightly more likely to use junior mortgages, whereas whites in both income groups are more likely to have home equity loans. That is, minorities, as compared to whites, have a much smaller percentage of home equity loans. For example, as a percentage of observations with first mortgages only 4.1 percent (74 / 1,821) of Hispanics and 3.8 percent of blacks have home equity loans, but 12.3 percent of their white counterparts do. This suggests that, for whatever reason, the white households are somewhat more willing and able to make use of this type of financing. For junior mortgages, this difference generally does not appear to exist.

### Junior Mortgages

For junior mortgages, all owners who indicated they had these financial instruments were included in the means analysis reported in Table 12. The monthly debt service and total amount of mortgage debt across all junior clients are calculated to give an idea of each group's total indebtedness in this area.<sup>28</sup> However, interest rates are considered only for second mortgages (which is, of course, the predominant loan). Similarly, the regression analysis was conducted for second mortgages only.<sup>29</sup> As in the prior analyses, in the case of the second mortgages, the loans that were included were made by a bank (not, for example, by a relative) and with only residential property acting as collateral for the loan.

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<sup>28</sup> The AHS provides the monthly debt service and the amount of the debt when borrowed for the second, third, fourth, and other mortgages. The monthly debt service is the payment due for each loan each month. See *Code Book for the American Housing Survey, Public Use File: 1997 and Later*, December 2004, Version 1.77.

<sup>29</sup> The slightly lower number of observations in the remaining tables is due to the possibility of a third mortgage. There are literally only a few such "third mortgages".

**Table 12**  
**Full Sample<sup>a</sup>**  
**Means**  
**Junior Mortgages**

Variable Name	Low-income			High-income		
	Hispanic	Black	White	Hispanic	Black	White
Interest Rate <sup>b</sup>	8.13%	8.89%	8.19%	8.37%	8.55%	7.73%
Monthly Debt Service <sup>c</sup>	\$436	\$304	\$393	\$442	\$397	\$451
Total Amount of Debt <sup>c</sup>	\$37,591	\$21,749	\$34,514	\$41,944	\$34,113	\$42,947
Current House Value	\$167,419	\$106,666	\$166,414	\$243,689	\$172,508	\$238,578
Monthly Housing Cost	\$1,538	\$1,193	\$1,481	\$1,960	\$1,697	\$1,953
Annual Household Income	\$32,957	\$28,154	\$32,943	\$109,274	\$92,340	\$110,103
<b>Number of Observations</b>	102	174	252	414	259	1,033

<sup>a</sup> The sample includes all households who have a second mortgage loan.

<sup>b</sup> Interest rate on the second mortgage.

<sup>c</sup> Total for all junior mortgages - up to 4.



Table 12 presents mean values for junior mortgages. White high-income households appear to have lower interest rates on these mortgages than either black or Hispanic households, which are 82 and 64 basis points higher, respectively. Interestingly, for the low-income subgroup, Hispanic and white households' average interest rates are comparable at 8.13 and 8.19 percent, respectively. However, blacks' average rate is 80 basis points higher than that of whites. This difference is almost identical to that in the high-income sub-sector of this market. Perhaps the most striking observation in Table 12 lies in the values for "total amount of debt" (third line in Table 12) for junior mortgages. It certainly does seem that Hispanic and white households, in particular, have taken on significant levels of junior mortgage debt. For example, among low-income households, Hispanic households have a debt figure of \$37,591 compared to that of \$34,514 for white households, and \$21,749 for African-American families. Considering these debt levels relative to annual income, low-income Hispanics have a particularly large amount of debt. Specifically, for low-income households, this ratio is 1.14 ( $\$37,591/\$32,957$ ); for whites it is 1.04 and blacks only 0.773. This translates to low-income Hispanics having relatively high monthly debt service on these junior mortgages. Specifically, Hispanics monthly debt service on junior financing is \$436, as compared to \$304 for blacks, and \$393 for whites. When considered relative to their monthly income these costs represent 15.88 percent for Hispanics ( $\$436/\$2746$ ), 12.96 percent for blacks, and 14.93 percent for whites.

Regression results for second mortgages are shown in Table 13. Black households (but not Hispanics) pay significantly higher rates on second mortgages than white households holding constant the metro area and time period in which the loan was originated, as well as the household, loan, and property characteristics indicated. In particular, the estimated differential between blacks and whites is 44.7 basis points. As in the case of first mortgages, educational attainment does lower reported interest rates. For example, college graduates are observed to pay an average of 97.1 basis points less than those who did not graduate high school on the junior mortgages that they have outstanding at the time of their interview. In general, white households who have junior mortgages have a higher level of education than minorities. This difference is most apparent for low-income individuals. For example, only 13.7 percent of low-income Hispanic household heads have a college degree or more. For African-Americans the rate is about 15.5 percent. In contrast, among white household heads 24.2 percent fall in this category.

As is the case with the home purchase and refinancing markets, several of our risk measures are significant predictors of interest rates. High housing-cost-to-income ratios and lower house values give rise to higher interest rates. Whereas, the proportions of Hispanics, blacks, and whites in different housing-cost-to-income categories do not look substantially different for either the high- or low-income subgroups, average house value is substantially lower for blacks than for either of the other racial/ethnic groups. Specifically, the average house value for black households is \$106,666, as compared to \$156,403 for whites and \$167,419 for Hispanics. In addition, as with the first mortgages examined previously, for second mortgages the shortest loan terms generally tend to have significantly lower interest rates. For example, second mortgages with a term in the range of 10 to 20 years have average interest rates over 105 basis points higher than loans with a term of five years or less.

**Table 13**  
**Full Sample <sup>a</sup>**  
**Second Mortgages**

Variable Names	Regression Coefficients <sup>b,c</sup>		Means					
			High-income			Low-income		
			Hispanic	Black	White	Hispanic	Black	White
Interest Rate	na		8.12623	8.88721	8.18948	8.37228	8.54875	7.72955
Intercept	9.18053	*	na	na	na	na	na	na
<b>Household Race</b>								
Black Household	0.44743	*	0.00000	1.00000	0.00000	0.00000	1.00000	0.00000
Non-White Hispanic Household	0.19985		0.23529	0.00000	0.00000	0.26329	0.00000	0.00000
White Hispanic Household	0.06977		0.76471	0.00000	0.00000	0.73671	0.00000	0.00000
<b>Household Characteristics</b>								
Single Female	-0.09982		0.18627	0.52874	0.31746	0.04106	0.18533	0.08906
Single Male	-0.06994		0.09804	0.12644	0.15476	0.04589	0.06950	0.07648
Age 24 or less	-0.77507		0.00000	0.01149	0.00794	0.00725	0.00386	0.00387
Age 45 - 61	-0.15998		0.32353	0.39080	0.39286	0.35266	0.45560	0.40755
Age 62 or more	-0.92149	*	0.16667	0.24713	0.13492	0.03140	0.06564	0.04743
High School Grad.	-0.69196	*	0.23529	0.20690	0.28175	0.17874	0.19305	0.16651
Post High School	-0.49440	**	0.31373	0.37931	0.36508	0.36473	0.34363	0.33591
College Graduate	-0.97105	*	0.13725	0.15517	0.24206	0.36715	0.40927	0.46467
.22<Housing Cost / Income<=.33	-0.44061	*	0.19608	0.21839	0.23016	0.28744	0.25869	0.24782
.16<Housing Cost / Income <=.22	-0.64024	*	0.03922	0.06897	0.06746	0.27778	0.30116	0.31559
Housing Cost / Income <=.16	-0.71181	*	0.01961	0.00000	0.01587	0.30918	0.33591	0.33398
Income/Household Size	-0.01577		0.99824	1.18339	1.39053	2.86406	2.89012	3.41864
Savings 20k or more	-0.47382		0.02941	0.01149	0.05159	0.00242	0.00386	0.00194
<b>Loan Characteristics</b>								
5 - 10 Year Loan Term	0.52542	*	0.19608	0.21839	0.17063	0.16908	0.22394	0.22943
10 - 15 Year Loan Term	1.05332	*	0.25490	0.32759	0.28571	0.40338	0.35521	0.31559
15 - 20 Year Loan Term	1.05993	*	0.04902	0.08621	0.08730	0.07246	0.08494	0.07551
20 - 30 Year Loan Term	0.33094	***	0.36275	0.27011	0.25000	0.23188	0.22394	0.21975
Loan Term > 30 years	-0.38742		0.00000	0.00575	0.00000	0.00000	0.00386	0.00194
<b>Property Characteristics</b>								
Current House Value	-0.02612	*	16.74190	10.66659	15.64032	22.24207	17.25083	22.46650
<b>Adjusted R<sup>2</sup></b>	0.2219							
<b>Number of Observations</b>	2234			174	252	414	259	1033

<sup>a</sup> The sample includes all households who have a second mortgage loan.

<sup>b</sup> \*, \*\*, and \*\*\* represent significance at the 1%, 5%, and 10% levels respectively.

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

## Home Equity Loans

For home equity loans, the AHS contains information on interest rates on all loans of this type held by the owner so the interest rate that is used in the analysis is the weighted average based on the amount of each loan (although there are very few households with two home equity loans and none with three). In 2002 and 2004 the AHS began to distinguish between home equity lines of credit and lump sum loans. However, because this information is not available in 1998 and because of small sample sizes across different race/income categories, we do not disaggregate home equity financing into lines of credit and lump-sum loans with fixed monthly debt service payments.

Mean values for household's home equity loans are presented in Table 14. Perhaps the most striking figures in Table 14 are those for the "total amount of debt" (third line of table) for all household home equity loans. Among both low- and high-income owners, Hispanic households have the highest amounts in the sample. Specifically, for low-income Hispanic households who have home equity loans, their average level of debt is \$4,742 more than that of blacks and \$3,226 more than whites. For high-income households these differences are \$7,850 and \$8,991 respectively. Considering the level of debt relative to income, for high-income households minorities have a bit more debt per dollar of annual income than whites, but the difference is not substantial. However, when low-income households are considered the ratio of home equity debt to current annual income is about 86.5 percent ( $\$26,142 / \$30,236$ ) for Hispanics, compared to 75.5 and 72.5 ratios for blacks and whites, respectively. These results are comparable to the circumstances observed for low-income Hispanics with second mortgages. Together the information presented on junior and home equity loans suggest that Hispanic households, who access home equity through these types of loans, incur more debt than their black or white counterparts. However, the terms of these loans will impact the magnitude of their debt service. Among low-income owners, interest rates on these loans are over 100 basis points lower for Hispanics than blacks (6.53 percent for Hispanics versus 7.74 percent for blacks), but this interest rate differential does not exist in comparison to white households (6.68 percent). More generally, if one considers monthly debt service relative to monthly income this ratio is lowest for low-income Hispanic families, 11.43 percent ( $(\$288 \times 12) / \$30,236$ ) compared to 13.75 percent and 11.63 percent for blacks and whites, respectively.

The interest rate regression results are reported in Table 15. They suggest that both non-white Hispanic households and black households pay higher rates on home equity loans than white households controlling for other factors. Note that, the only variables that are really significant are the housing-cost-to-income categorical variables and current house value. As in the other interest rate regressions that have been presented, the first variable represents a fundamental measure of default risk for the borrowers, and the second a basic way of capturing the quality of the property acting as collateral for these loans. For both income groups, Hispanics are observed to have substantially higher level of housing cost relative to income than is the case with other households. In particular, 74.3 percent of low-income Hispanics who have home equity loans are in the highest housing-cost-to-income category (greater than 33 percent). Only 60.0 percent of blacks and 56.5 percent of whites have housing-cost-to-income ratios that are in this range. For higher-income households, these ratios are generally not as high, but if one considers the top two categories, Hispanics have 50.5 percent (30.4 percent plus 20.1 percent) of households with housing cost above 22 percent, whereas the same percentages for African-American and white households are 36.1 percent and 42.3 percent, respectively. This suggests that higher levels of debt contribute to increasing the rates paid by

Hispanics relative to other ethnicities. Analogously, as we have seen in all sub-samples, blacks with home equity loans will have relatively higher rates in part because of their lower house values.

**Table 14**  
**Full Sample<sup>a</sup>**  
**Means**  
**Home Equity Loans<sup>b</sup>**

Variable Name	Low-income			High-income		
	Hispanic	Black	White	Hispanic	Black	White
Interest Rate <sup>c</sup>	6.53%	7.74%	6.68%	6.98%	7.41%	6.72%
Monthly Debt Service <sup>d</sup>	\$288	325	306	405	388	429
Total Amount of Debt <sup>d</sup>	26,142	21,399	22,916	35,051	27,201	26,060
Current House Value	223,641	123,571	183,102	294,233	202,130	257,307
Monthly Housing Cost	899	714	837	1,631	1,273	1,379
Annual Household Income	30,236	28,324	31,587	120,662	98,545	113,224
<b>Number of Observations</b>	74	80	393	283	147	1493

<sup>a</sup> The sample includes all families who have a home equity loan.

<sup>b</sup> No distinction is made between lump-sum home equity loans and lines of credit.

<sup>c</sup> Weighted average of cost of up to 2 home equity loans.

<sup>d</sup> Represents the total for all home equity loans - up to 3.

**Table 15**  
**Full Sample<sup>a</sup>**  
**Home Equity Loans<sup>b</sup>**

Variable	Regression		Means					
			Low-income			High-income		
Names	Coefficients <sup>c,d,e</sup>		Hispanic	Black	White	Hispanic	Black	White
Interest Rate	na		6.52546	7.74440	6.67957	6.97700	7.40986	6.71614
Intercept	6.80231	*	na	na	Na	na	na	na
<b>Household Race</b>								
Black Household	0.52322	*	0.00000	1.00000	0.00000	0.00000	1.00000	0.00000
Non-White Hispanic Household	0.62674	**	0.16216	0.00000	0.00000	0.20495	0.00000	0.00000
White Hispanic Household	0.11176		0.83784	0.00000	0.00000	0.79505	0.00000	0.00000
<b>Household Characteristics</b>								
Single Female	-0.09450		0.28378	0.43750	0.27735	0.03180	0.18367	0.07971
Single Male	-0.08529		0.13514	0.16250	0.13995	0.04594	0.08163	0.08104
Age 24 or less	-1.07545	***	0.01351	0.00000	0.01527	0.01060	0.00000	0.00201
Age 45 - 61	-0.14770		0.35135	0.38750	0.37405	0.51237	0.60544	0.50971
Age 62 or more	-0.20480		0.37838	0.38750	0.38422	0.04947	0.09524	0.10181
High School Grad.	0.26854		0.28378	0.18750	0.34097	0.11307	0.12245	0.15740
Post High School	0.22005		0.39189	0.38750	0.28753	0.33216	0.35374	0.29203
College Graduate	0.00912		0.16216	0.21250	0.27735	0.50177	0.51020	0.51909
Income/Household Size	0.02074		1.12105	1.28883	1.45157	3.21931	3.03552	3.70123
Savings 20k or more	-0.13541		0.04054	0.07500	0.09669	0.01413	0.01361	0.01340
.22<Housing Cost / Income <=.33	-0.20957	***	0.09459	0.16250	0.17048	0.30389	0.17687	0.28667
.16<Housing Cost / Income <=.22	-0.36253	*	0.10811	0.10000	0.15013	0.27915	0.29932	0.27729
Housing Cost / Income <=.16	-0.55485	*	0.05405	0.13750	0.11450	0.21555	0.34014	0.29940
<b>Property Characteristics</b>								
Current House Value	-0.01358	*	19.33944	12.35709	18.31017	27.95724	18.83493	24.23831
<b>Adjusted R<sup>2</sup></b>	0.4493							
<b>Number of Observations</b>	2470		74	80	393	283	147	1493

<sup>a</sup> The sample includes all families who have a home equity loan.  
<sup>b</sup> No distinction is made between lump-sum home equity loans and lines of credit.  
<sup>c</sup> Weighted average of cost of up to 2 home equity loans.  
<sup>d</sup> Represents the total for all home equity loans - up to 3,  
<sup>e</sup> All regressions include discrete variables indicating in which of 41 SMSAs the housing units were located.

## VI. Conclusions

Utilizing the AHS, this report attempted to investigate differences in the terms, conditions, and use of financing alternatives across ethnic groups. The analysis presented employed recent MSA samples of the American Housing Survey (AHS) for 1998, 2002, and 2004 to address these issues and see how financing factors differ for Hispanics as compared to other ethnic groups across a number of different housing markets.

As noted, there is, of course, no “perfect” publicly available data set to investigate the issues and policy concerns above. Specifically, we do not have information on the credit situation and net-worth position of households in the sample. Nor do we know who the lenders are and what their underwriting criteria are. However, the characteristics of the AHS do allow research to suggest avenues for future investigation and potential policy concerns. To this end, the results above suggest several general conclusions:

1. Black households in the sample do not appear to be doing quite as well as white households and Hispanics households financially (as evidenced by lower incomes and house values) and they do appear to be paying more for their financing.
2. To the extent that Hispanics do fare worse in the mortgage markets, the effect seems to be coming from the subgroup of non-white Hispanic households. For home purchases, 35 – 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. Previously, white and non-white Hispanics have not been considered separately in the mortgage pricing literature.
3. There are more significant ethnic effects in the conventional purchase market than for loans originating in the FHA/VA market.
4. Household educational levels are an important factor associated with lower interest rates in most markets. This effect contributes to racial/ethnic differences in interest rates due to educational attainment differentials across the groups. In particular, Hispanic and African-American households have lower levels of education on average than their white counterparts which tend to increase their mortgage interest rates.
5. Similarly, housing-cost-to-income ratios, loan-to-value ratios (for recent movers), and current house value are all consistent predictors of interest rates. Mean value differences by race/ethnicity suggest that the first two factors contribute to higher interest rates for Hispanics, while the third factor contributes to higher rates for blacks.
6. For junior mortgages and home equity loans, the specifications are limited by the information that is available on loan characteristics. However, it is interesting that for second-mortgage interest rates, education appears very important, but *ceteris paribus*, Hispanic households do not appear to obtain higher rates than white households (although black households do). On the other hand, with home equity loans, both black households and non-white Hispanic households have significantly higher rates. In general, low-



income Hispanics appear to be taking on a lot of non-primary mortgage debt as compared to their counterparts

This study represents a first step in understanding how the mortgage market experience of minorities, particularly Hispanic households, differs from comparable white households. The analysis suggest areas for further study and, in a few instances, areas in which improvements in the characteristics of minority families and/or their housing situation could help improve their mortgage market outcomes. To better understand these issues it is imperative that data containing the details of household's credit quality, net worth, and the underwriting criteria of the financial institutions that provide funding to these families be made generally available to researchers working in this area. A clear understanding of these mortgage markets and the reasons for differentials in the terms, conditions and use of mortgage debt by different racial/ethnic and income groups is crucial if we are to provide equal access to homeownership—and the benefits of homeownership—for all Americans.

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## **Appendix A**

### **List of Metropolitan Statistical Areas in the AHS for 1998, 2002, and 2004**

**Appendix A**

**American Housing Survey SMSA Sample Information**

<b>Sample Year</b>	<b>SMSA Code</b>	<b>SMSA Name</b>	<b>SMSA Median Income</b>
2004	520	Atlanta, GA	\$ 69,000
2004	1680	Cleveland, OH	\$ 59,900
2004	2080	Denver, CO	\$ 69,500
2004	3280	Hartford, CT	\$ 73,900
2004	3480	Indianapolis, IN	\$ 63,800
2004	4920	Memphis, TN	\$ 54,100
2004	5560	New Orleans, LA	\$ 49,900
2004	5880	Oklahoma City, OK	\$ 52,100
2004	6280	Pittsburg, PA	\$ 55,100
2004	6920	Sacramento, CA	\$ 64,100
2004	7040	Saint Louis, MO	\$ 65,900
2004	7240	San Antonio, TX	\$ 51,500
2004	7600	Seattle, WA	\$ 71,900
2002	360	Anaheim-Santa Anna-Garden Grove, CA	\$ 75,600
2002	1280	Buffalo, NY	\$ 50,800
2002	1520	Charlotte-Gastonia, NC	\$ 64,100
2002	1840	Columbus, OH	\$ 63,400
2002	1920	Dallas, TX	\$ 66,500
2002	2800	Fort Worth-Arlington, TX	\$ 61,300
2002	3760	Kansas City, KS-MO	\$ 64,500
2002	5000	Miami-Hialeah, FL	\$ 48,200
2002	5080	Milwaukee, WI	\$ 67,200
2002	6200	Phoenix, AZ	\$ 57,900
2002	6440	Portland, OR-WA	\$ 57,200
2002	7280	San Bernadino-Riverside, CA	\$ 50,300
2002	7320	San Diego, CA	\$ 60,100
1998	720	Baltimore, MD	\$ 55,600
1998	1000	Birmingham, AL	\$ 44,000
1998	1120	Boston, MA	\$ 60,000
1998	1640	Cincinnati, OH-KY-IN	\$ 51,500
1998	3360	Houston, TX	\$ 50,400
1998	5120	Minneapolis-St. Paul	\$ 60,800
1998	5680	Newport News-Hampton, VA	\$ 44,600
1998	5775	Oakland, CA	\$ 63,300
1998	6480	Providence, RI	\$ 46,900
1998	6840	Rochester, NY	\$ 48,800
1998	7160	Salt Lake City-Ogden, UT	\$ 48,200
1998	7360	San Francisco, CA	\$ 68,600
1998	7400	San Jose, CA	\$ 77,200
1998	8280	Tampa-Saint Petersburg-Clearwater, FL	\$ 42,000
1998	8840	Washington, DC, MD, VA	\$ 72,300