How Many Homeowners Are at Risk of Missing the Window to Refinance? Evidence from the 2016 Survey of Consumer Finances

NOVEMBER 2018 | JONATHAN SPADER

JCHS
JOINT CENTER FOR HOUSING STUDIES OF HARVARD UNIVERSITY

With interest rates ticking upward in 2018 and the prospect of further rate increases to come, the era of historically-low mortgage rates may be ending. While many homeowners have taken advantage of low interest rates by refinancing, some homeowners have not. This research brief draws on the Survey of Consumer Finances to examine the extent to which homeowners had and had not refinanced prior to the 2016 survey. It then identifies and describes the mortgage and demographic characteristics of homeowners who may be affected by rising rates, including those with adjustable-rate mortgages and those with fixed interest rates of 5 percent or higher.

The analysis shows that sizable numbers of homeowners who stayed in the same home between 2007 and 2016 had not refinanced. Nearly 15 percent of all homeowners in 2016 continued to hold mortgages originated in 2007 or earlier. While many of these homeowners may have opted not to refinance due to already low interest rates or a small remaining balance, 3.3 million households in 2016 (4.5 percent of all homeowners) held pre-2008 mortgages with interest rates of at least 5 percent and loan balances of at least $50,000. Another 5.9 million households (8.0 percent of all homeowners) held mortgages originated in later years that had interest rates of at least 5 percent and remaining loan balances of at least $50,000. While some homeowners in this group may not have qualified for a prime rate at origination, rising interest rates will nonetheless remove the opportunity for this group to lower their long-term costs of homeownership if they are able to improve their credit history, build equity, or otherwise improve their credit profile to qualify for a prime rate in the future. Lastly, the results show that these refinancing outcomes do not occur evenly across demographic groups, raising concerns about the potential for disparities in refinancing activities to contribute to disparities in the long-term costs of homeownership.

Data: The Survey of Consumer Finances (SCF)

This research brief uses information available in the Surveys of Consumer Finances (SCF) for 1995-2016 to describe homeowners' financing and refinancing activities. Collected every three years, the SCF includes detailed survey information about homeowners' refinancing behaviors. The SCF reports information for "primary economic units," which are similar to households but excludes any household members who are financially independent. More precisely, SCF defines primary economic units to consist of "an economically dominant single individual or couple (married or living as partners) in a household and all other individuals in the household who are financially interdependent with that individual or couple." For simplicity, this research brief uses the terms "household" or "homeowner" to refer to primary economic units.

All estimates are weighted to be representative of all primary economic units in the United States using the sample weights provided by SCF. For estimates describing the population of homeowners, the sample excludes owners of farms and manufactured homes due to the different financing options available for these properties. The estimates for homeowners are therefore representative of all homeowners whose primary residence is not a farm or manufactured home.

Results

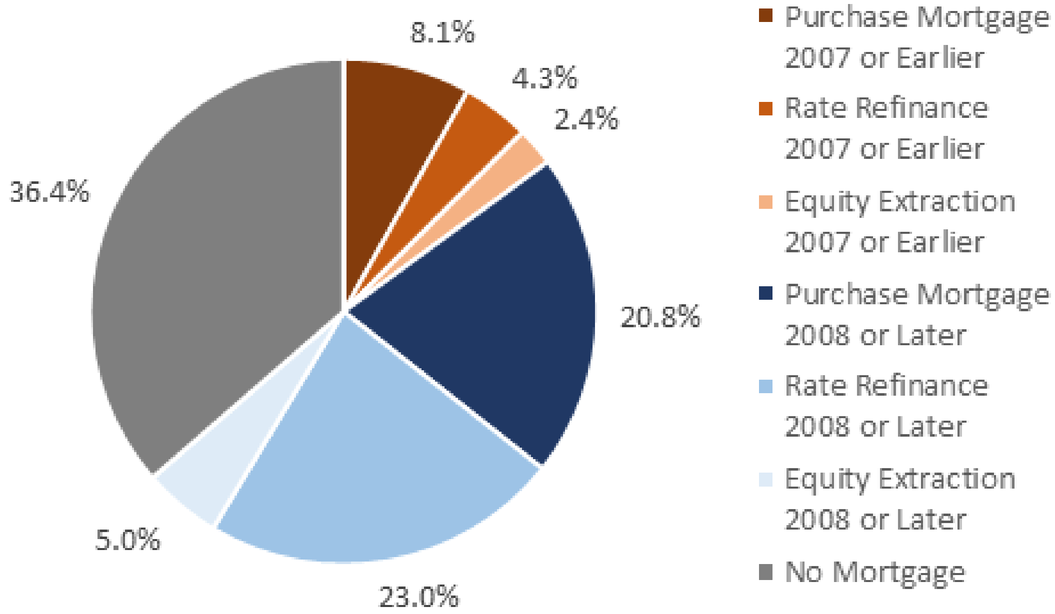
The long-term decline in interest rates since the 1980s generated substantial incentives for many homeowners to refinance in order to secure lower interest rates and lower their long-term costs of homeownership. The average interest rate on a 30-year fixed-rate mortgage (FRM) declined from more than 10 percent in the 1980s to just 3.7 percent in 2012, before leveling out near or below 4 percent from 2012 to 2017. Because interest rates averaged around 6 percent during the housing boom period from 2002 to 2007, many homeowners who purchased during that period were able to reduce their interest rate by 1-2 percentage points or more in recent years. With interest rates moving upward to 4.6 percent in June 2018 and the Federal Reserve signaling further rate hikes, the window for homeowners to refinance may be closing.

In 2016, 35 percent of all homeowners held a refinanced mortgage, including 27 percent who refinanced to reduce their interest rate and 7 percent who extracted equity during the transaction. This figure represents a 10-percentage-point increase from 1995, when 25 percent of homeowners held a refinanced mortgage. By contrast, 29 percent of all homeowners were paying off their initial purchase mortgage in 2016, compared to 37 percent in 1995. The remaining 36 percent of homeowners in 2016 had paid off their mortgage.[1]

Only 15 percent of all homeowners in 2016 were paying ff mortgages originated in 2007 or earlier, compared to 49 percent with mortgages originated in 2008 or later and 36 percent with no mortgage (Figure 1).[2] Among the pre-2008 mortgages, 14 percent were adjustable-rate and 86 percent were FRMs that would have locked in place the higher interest rates that prevailed prior to 2008. For example, as Table 1 shows, the median interest rate on pre-2008 FRMs was 5.0 percent, well above the 3.9 percent median among FRMs originated in 2008 or later. In contrast, the median interest rate on pre-2008 adjustable rate mortgages (ARMs) was 3.5 percent in 2016, similar to the 3.5 percent median among ARMs originated in 2008 or later. While these latter figures highlight the benefits of ARMs during periods of declining interest rates, ARM holders may face higher payments in coming years if interest rates continue to rise. While such increases are by no means certain, refinancing during the recent period of low interest rates may nonetheless have been attractive for any ARM borrowers who might struggle to afford higher payments—or who anticipate higher interest rates in coming years.

FIGURE 1

DISTRIBUTION OF HOMEOWNERS IN 2016 BY MORTGAGE TYPE AND TIMING OF ORIGINATION



Notes: Estimates representative of all homeowners in 2016, excluding farms and mobile homes
Source: JCHS analysis of the 2016 Survey of Consumer Finances.

TABLE 1

ARM SHARE AND MEDIAN INTEREST RATE OF MORTGAGES BY TIMING AND TYPE

Panel 1: ARM Share among All Mortgaged Homeowners.

	Rate Refinance	Equity Extraction	Purchase Mortgage	All
Total	6.8%	10.6%	6.5%	7.1%
2007 or earlier	14.0%	15.0%	14.3%	14.3%
2008 or later	5.5%	8.4%	3.5%	4.9%

Panel 2: Median Interest Rate of ARM Loans

	Rate Refinance	Equity Extraction	Purchase Mortgage	All
Total	3.4	3.8	3.6	3.5
2007 or earlier	3.1	4.5	3.5	3.5
2008 or later	3.5	3.5	3.9	3.5

Panel 3: Median Interest Rate of FRM Loans

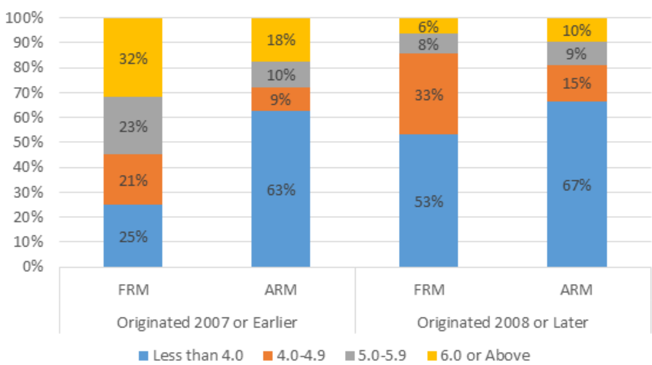
	Rate Refinance	Equity Extraction	Purchase Mortgage	All
Total	3.9	4.2	4.0	4.0
2007 or earlier	4.5	5.0	5.3	5.0
2008 or later	3.8	3.9	4.0	3.9

Notes: Rate refinance defined as any refinance that does not include equity extraction.
Source: JCHS analysis of the 2016 Survey of Consumer Finances.

Figure 2 displays more detail about the distribution of interest rates for each group, highlighting the extent to which homeowners with pre-2008 FRMs are paying higher interest rates than those paid by other groups. Figure 3 shows the extent of variation in interest rates between homeowners with pre- and post-2008 loans that were originated for purchase, refinance, or equity extraction. While pre-2008 rate refinances have somewhat lower interest rates than pre-2008 purchase or equity extraction loans, the interest rates for all three groups remain well above the rates for all three groups of loans originated in 2008 or later. This result illustrates the broad effects of the declining interest-rate environment experienced in recent years.

FIGURE 2

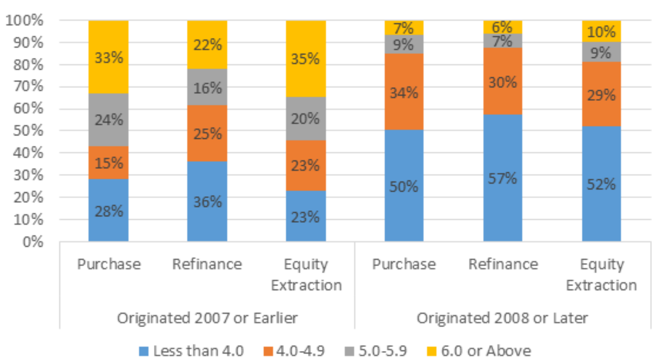
DISTRIBUTION OF MORTGAGE INTEREST RATES IN 2016 BY TYPE AND TIMING



Notes: Sample includes all homeowners with a mortgage in 2016, excluding farms and mobile homes.
Source: JCHS analysis of 2016 Survey of Consumer Finances data.

FIGURE 3

DISTRIBUTION OF MORTGAGE INTEREST RATES IN 2016 BY LOAN PURPOSE AND TIMING



Notes: Sample includes all homeowners with a mortgage in 2016, excluding farms and mobile homes.
Source: JCHS analysis of 2016 Survey of Consumer Finances data.

These results also highlight that in 2016 many homeowners with both pre- and post-2008 mortgages had interest rates high enough to make refinancing attractive. However, for homeowners with high interest rates but relatively small mortgage balances, the transaction costs associated with a refinance may have outweighed the benefits of a reduced interest rate. For example, refinancing a $50,000 loan balance from 5 percent to 4 percent would reduce the monthly payment by $24 for a 10-year loan and $29 for a 30-year loan, producing savings of $2,880 and $10,440 over the life of each loan, respectively. While these figures likely outweigh the costs associated with refinancing, they also highlight that the payoff to refinancing for homeowners with small remaining loan balances depends on homeowners' specific circumstances such as the remaining term of the existing loan, the amount of closing costs on a refinanced loan, the expected opportunity costs associated with paying closing costs immediately, and other factors.

To provide a more detailed measure of the share of the share of homeowners who might benefit from refinancing, Table 2 displays the number and share of homeowners with interest rates and loan balances above various thresholds. For example, in 2016 3.3 million homeowners (4.5 percent of all homeowners) had an interest rate of 5 percent or more on a pre-2008 loan with a balance of at least $50,000, including 1.6 million (2.2 percent) who had an interest rate of 5 percent or more on a pre-2008 loan with a balance of at least $100,000. Among all homeowners in 2016, 9.2 million (12.5 percent of all homeowners) had an interest rate of 5 percent or more on a mortgage loan with a balance of at least $50,000.

While these figures suggest that a majority of the homeowners with pre-2008 mortgages had either a remaining balance below $50,000 or an interest rate below 5 percent, they also show that a sizable number of homeowners held pre-2008 mortgages with high interest rates and large loan balances. Both for individual households and in aggregate terms, the lost potential for savings can be substantial. For example, if each of the 9.2 million homeowners with interest rates of 5 percent or more and loan balances of at least $50,000 were able to refinance to the 4.57 percent interest rate averaged among 30-year FRMs in June 2018, the aggregate savings would amount to approximately $261 billion.[3] For individual households, this amounts to a median of $14,900 (average of $28,300) in reduced interest costs over the remaining life of the mortgage. While some of these households may not have had access to refinancing opportunities at a 4.57 percent interest rate due to negative equity or other credit constraints, these figures nonetheless illustrate the steep costs borne by homeowners who did not have the opportunity to refinance during the recent period of low rates.

TABLE 2

CUMULATIVE NUMBER AND SHARE OF ALL HOMEOWNERS WITH INTEREST RATES AND LOAN BALANCES ABOVE VARIOUS THRESHOLDS[4]

		Cumulative Number of Homeowners				Cumulative Share of All Homeowners			
Panel 1: All Homeowners with a Mortgage									
		Loan Balance is equal to or greater than...				Loan Balance is equal to or greater than...			
		$200K+	$100k+	$50k+	$1+	$200K+	$100k+	$50k+	$1+
Interest rate is equal to or greater than...	7+	277,878	948,499	2,044,329	3,196,814	0.4%	1.3%	2.8%	4.3%
	6+	583,703	1,977,814	4,186,162	6,238,752	0.8%	2.7%	5.7%	8.4%
	5+	2,029,369	5,425,070	9,249,611	12,881,892	2.7%	7.3%	12.5%	17.4%
	4+	7,598,208	17,633,734	25,235,503	30,601,573	10.3%	23.8%	34.1%	41.4%
	<4	12,810,664	28,502,417	39,827,237	46,915,673	17.3%	38.5%	53.8%	63.4%
Panel 2: Homeowners with Mortgages Originated in 2007 or Earlier									
		Loan Balance is equal to or greater than...				Loan Balance is equal to or greater than...			
		$200K+	$100k+	$50k+	$1+	$200K+	$100k+	$50k+	$1+
Interest rate is equal to or greater than...	7+	142,004	514,801	1,072,063	2,050,671	0.2%	0.7%	1.4%	2.8%
	6+	272,543	977,793	2,098,575	3,585,994	0.4%	1.3%	2.8%	4.8%
	5+	568,592	1,594,152	3,339,341	5,968,053	0.8%	2.2%	4.5%	8.1%
	4+	890,014	2,351,151	4,878,537	8,302,404	1.2%	3.2%	6.6%	11.2%
	<4	1,414,760	3,516,913	6,788,357	10,969,475	1.9%	4.8%	9.2%	14.8%
Panel 3: Homeowners with Mortgages Originated in 2008 or Later									
		Loan Balance is equal to or greater than...				Loan Balance is equal to or greater than...			
		$200K+	$100k+	$50k+	$1+	$200K+	$100k+	$50k+	$1+
Interest rate is equal to or greater than...	7+	135,874	433,698	972,266	1,146,143	0.2%	0.6%	1.3%	1.5%
	6+	311,159	1,000,020	2,087,586	2,652,757	0.4%	1.4%	2.8%	3.6%
	5+	1,460,776	3,830,917	5,910,269	6,913,839	2.0%	5.2%	8.0%	9.3%
	4+	6,708,193	15,282,582	20,356,965	22,299,169	9.1%	20.7%	27.5%	30.1%
	<4	11,395,903	24,985,502	33,038,877	35,946,195	15.4%	33.8%	44.7%	48.6%

Notes: Balances in 2016 dollars. N=2,332 homeowners with a mortgage in 2016, excluding farms and mobile; homes N=491 homeowners with pre-2008 mortgages.
Source: JCHS analysis of 2016 Survey of Consumer Finances data.

Low credit scores, limited or negative equity, or other credit constraints may have prevented some of these homeowners from refinancing their mortgages. For other homeowners, retaining their pre-2008 mortgage may reflect a lack of knowledge about refinancing options. While the SCF does not include sufficient information to separate these possibilities, the mortgage attributes in Table 3 suggest that credit constraints may have played a role in preventing some households from refinancing. For this analysis, we define 'high-rate, high-balance' to include homeowners with interest rates of at least 5 percent and loan balances of at least $50,000. While alternative cutoff points might also be chosen, this definition is likely to identify a set of homeowners who would likely have benefited from refinancing if they were able to lock in the 2016 average prime FRM rate of 3.65 percent.

Among homeowners with pre-2008 high-rate, high-balance mortgages, 35 percent had mortgage payment-to-income ratios above 30 percent and 23 percent have total debt-to-income ratios above 50 percent, compared to 15 percent and 9 percent, respectively, among all mortgaged homeowners. Similarly, 9 percent of these homeowners had negative equity in 2016, compared to just 3 percent of all mortgaged homeowners. These figures suggest that homeowners with negative equity or high debt-to-income ratios were less likely to have refinanced, although they also highlight that the majority of homeowners with pre-2008 high-rate, high-balance mortgages had both positive equity and debt-to-income ratios below these thresholds.

The Survey of Consumer Finances unfortunately does not contain information about consumers' credit scores, which may be an additional constraint to refinancing for many homeowners. Instead, Table 3 displays a measure of credit quality that compiles the information SCF collects about credit approvals and rejections. In 2016, 15 percent of homeowners with pre-2008 high-rate, high-balance mortgages reported having a credit application rejected or approved for less than they applied for, compared to 11 percent of all homeowners with mortgages. Another 10 percent reported not applying for credit because they thought they would be rejected, compared to just 5 percent among all homeowners with mortgages. These figures, along with other information shown in Table 3, suggest both that credit history may have prevented some households from refinancing and also that the majority of households did not report any credit rejections.

TABLE 3

MORTGAGE CHARACTERISTICS FOR SELECTED GROUPS OF HOMEOWNERS[5]

	All Owners	All Mortgaged Owners	All FRM	All ARM	All High-Rate, High-Balance	Pre-2008 High-Rate, High-Balance
Home Equity						
Negative equity	1.9%	2.9%	2.9%	3.8%	6.5%	9.4%
Equity 0-19%	12.5%	19.2%	19.3%	18.6%	25.0%	16.3%
Equity 20% or more	85.6%	77.9%	77.9%	77.7%	68.5%	74.3%
Debt-to-Income Ratios						
Front End Ratio > 30%	9.9%	14.8%	14.3%	22.3%	26.1%	35.0%
Back End Ratio > 50%	6.0%	8.5%	8.0%	14.8%	17.6%	23.4%
Neither	89.1%	84.2%	84.8%	76.3%	72.6%	64.3%
Credit Approvals Past 12 Months						
Application Rejected	9.4%	11.0%	11.3%	7.9%	13.1%	15.0%
No App/Expect Rejection	4.5%	4.6%	4.5%	7.0%	8.5%	10.4%
None of the Above	86.1%	84.3%	84.3%	85.1%	78.5%	74.6%

Notes: Home equity is defined as a percentage of home value. The front-end ratio is defined as the ratio of monthly mortgage payments to monthly income, and the back-end ratio is defined as the ratio of total monthly debt payments to monthly income, as defined int he SCF's published variables. Debt-to-income ratio figures sum to more than 100 percent because the front-end and back-end ratio measures are not mutually exclusive. Low rate is defined to include all homeowners with a mortgage interest rate below 5 percent.
Source: JCHS analysis of 2016 Survey of Consumer Finances data.

TABLE 4

DEMOGRAPHIC CHARACTERISTICS FOR SELECTED GROUPS OF HOMEOWNERS[6]

	All Owners	All Mortgaged Owners	All FRM	All ARM	All High-Rate, High-Balance	Pre-2008 High-Rate, High-Balance
Age of Householder						
<35	12%	16%	17%	3%	13%	4%
35-44	16%	21%	22%	16%	20%	16%
45-54	20%	24%	24%	29%	31%	36%
55-64	22%	22%	22%	26%	20%	28%
65+	30%	16%	16%	26%	15%	17%
Race/Ethnicity						
White	73%	70%	71%	62%	61%	56%
Black	10%	12%	11%	16%	18%	20%
Hispanic	10%	11%	11%	10%	14%	15%
Asian/Other	7%	8%	7%	12%	8%	9%
Household Income						
<$25,000	12%	7%	7%	10%	11%	16%
$25,000-$49,999	21%	18%	18%	17%	22%	22%
$50,000-$99,999	32%	34%	34%	35%	33%	37%
$100,000+	35%	41%	41%	39%	34%	25%
Education						
< High school diploma	5%	4%	4%	3%	5%	3%
High school diploma	18%	13%	13%	13%	15%	13%
Some post-secondary	26%	27%	27%	26%	35%	42%
4-year degree or more	51%	56%	56%	58%	45%	41%
Net Worth Quintile						
Lowest	3%	5%	5%	3%	6%	11%
Low	10%	13%	13%	9%	19%	6%
Middle	25%	27%	27%	25%	34%	40%
High	31%	28%	28%	32%	25%	28%
Highest	31%	27%	27%	31%	16%	16%

Source: JCHS analysis of 2016 Survey of Consumer Finances data.

Lastly, the demographic attributes in Table 4 also show that homeowner refinancing has not occurred evenly across groups. When compared to all mortgaged homeowners, those with pre-2008, high-rate, high-balance mortgages are less likely to be in the highest income and wealth quintiles or to have a 4-year college degree. Black and Hispanic homeowners are also more likely than white households to have pre-2008, high-rate, high-balance mortgages. While a full decomposition of these differences is beyond the scope of this research brief, the figures in Table 4 highlight the potential for disparities in refinancing activities to contribute to disparities in the long-term costs of homeownership.

Conclusion

This research brief draws on the Survey of Consumer Finances to take a closer look at the extent to which homeowners have and have not refinanced to take advantage of historically-low interest rates in recent years. The analysis shows that a large share of homeowners who stayed in the same home between 2007 and 2016 refinanced to benefit from lower interest rates. However, 4.5 percent of all homeowners in 2016 (3.3 million) reported that they continued to have a pre-2008 mortgage with an interest rate of 5 percent or more and a loan balance of at least $50,000. Additionally, another 8.0 percent of all homeowners (5.9 million) held mortgages originated in later years that had interest rates of at least 5 percent and remaining loan balances of at least $50,000. With interest rates moving upward in early 2018 and the Federal Reserve signaling further rate hikes, the window may be closing for these homeowners to lock in lower interest rates and reduce their long-term costs of homeownership.

Additionally, 7.1 percent of all homeowners in 2016 held ARMs. While many of these homeowners likely chose the RM structure intentionally to benefit from a lower interest rate, some members of this group may benefit from refinancing to the extent that they anticipate continued interest rate increases or would struggle to afford higher monthly payments.

The available data unfortunately does not allow the research brief to measure how many of each group of homeowners were constrained from qualifying for a lower-cost refinancing option, and how many did not refinance by choice or due to a lack of knowledge about their options. For example, the Home Affordable Refinancing Program (HARP) expanded access to refinancing options for homeowners who had remained current on their mortgage but had limited or negative equity. However, some homeowners may not have been aware of the HARP program while others likely had recent delinquencies or other credit characteristics that would have made them ineligible for HARP and other refinancing products. Lastly, the prevalence of risky refinancing activity during the foreclosure crisis may have made some homeowners reluctant to refinance and wary of the institutions marketing refinancing products.

Endnotes

1. See Appendix Table A1.
2. See Appendix Table A2.
3. This is calculated as the difference between the total sum of all remaining monthly payments on a fully-amortizing FRM at the homeowner's reported interest rate and the total sum of all remaining montly payments on a fully-amortizing FRM with an interest rate of 4.57 percent. The remaining term on the refinanced loan is assumed to be the same as the remaining term on the existing loan, and the initial loan amount is set to the homeowner's reported remaining balance on their first mortgage.
4. See Appendix Table A3 for estimates by loan type (FRM/ARM).
5. See Appendix Table A4 for estimates of the number of households in each category.
6. See Appendix Table A5 for estimates of the number of households in each category.

Supplemental Tables

APPENDIX TABLE A1:

NUMBER AND SHARE OF HOMEOWNER HOUSEHOLDS BY MORTGAGE PRESENCE AND TYPE

Panel 1: Number of Homeowners

	No Mortgage	Purchase Mortgage	Rate Refinance	Equity Extraction
1995	22,072,893	21,363,686	10,660,679	3,999,653
1998	23,431,241	22,945,592	10,210,891	6,281,232
2001	23,693,913	24,131,141	12,118,880	6,368,083
2004	24,095,121	20,277,244	18,202,294	9,141,490
2007	24,327,968	23,121,590	16,680,183	10,153,906
2010	23,350,399	23,271,641	18,996,003	7,730,106
2013	25,571,444	18,589,846	23,520,712	5,427,350
2016	26,920,091	21,361,005	20,190,979	5,494,276

Panel 2: Percent of Homeowners

	No Mortgage	Purchase Mortgage	Rate Refinance	Equity Extraction
1995	38.0%	36.8%	18.3%	6.9%
1998	37.3%	36.5%	16.2%	10.0%
2001	35.7%	36.4%	18.3%	9.6%
2004	33.6%	28.3%	25.4%	12.7%
2007	32.8%	31.1%	22.5%	13.7%
2010	31.8%	31.7%	25.9%	10.5%
2013	35.0%	25.4%	32.2%	7.4%
2016	36.4%	28.9%	27.3%	7.4%

Source: JCHS analysis of the Surveys of Consumer Finances 1995-2016

APPENDIX TABLE A2:

NUMBER AND SHARE OF HOMEOWNERS IN 2016 BY TIMING OF MORTGAGE ORIENTATION

Panel 1: Number of Homeowners

	Rate Refinance	Equity Extraction	Purchase Mortgage	No Mortgage	All Homeowners
Total	20,190,979	5,494,276	21,361,005	26,920,091	73,966,351
2007 or earlier	3,205,965	1,807,287	6,012,256	N/A	11,025,508
Post-2007	16,985,014	3,686,989	15,348,749	N/A	36,020,752

Panel 2: Share of Homeowners

	Rate Refinance	Equity Extraction	Purchase Mortgage	No Mortgage	All Homeowners
Total	27.3%	7.4%	28.9%	36.4%	100.0%
2007 or earlier	4.3%	2.4%	8.1%	-	14.9%
Post-2007	23.0%	5.0%	20.8%	-	48.7%

APPENDIX TABLE A3:

CUMULATIVE NUMBER AND SHARE OF ALL HOMEOWNERS WITH INTEREST RATES AND LOAN BALANCES ABOVE VARIOUS THRESHOLDS

		Cumulative Number of Homeowners				Cumulative Share of All Homeowners			
Panel 1: All Homeowners with a Mortgage									
		Loan Balance is equal to or greater than...				Loan Balance is equal to or greater than...			
		$200K+	$100k+	$50k+	$1+	$200K+	$100k+	$50k+	$1+
Interest rate is equal to or greater than...	7+	277,878	948,499	2,044,329	3,196,814	0.4%	1.3%	2.8%	4.3%
	6+	583,703	1,977,814	4,186,162	6,238,752	0.8%	2.7%	5.7%	8.4%
	5+	2,029,369	5,425,070	9,249,611	12,881,892	2.7%	7.3%	12.5%	17.4%
	4+	7,598,208	17,633,734	25,235,503	30,601,573	10.3%	23.8%	34.1%	41.4%
	<4	12,810,664	28,502,417	39,827,237	46,915,673	17.3%	38.5%	53.8%	63.4%
Panel 2: Homeowners with ARM Mortgages									
		Loan Balance is equal to or greater than...				Loan Balance is equal to or greater than...			
		$200K+	$100k+	$50k+	$1+	$200K+	$100k+	$50k+	$1+
Interest rate is equal to or greater than...	7+	67,445	83,276	267,131	313,267	0.1%	0.1%	0.4%	0.4%
	6+	148,635	182,938	398,901	470,152	0.2%	0.2%	0.5%	0.6%
	5+	344,218	396,890	711,552	850,108	0.5%	0.5%	1.0%	1.1%
	4+	638,631	864,278	1,367,792	1,562,943	0.9%	1.2%	1.8%	2.1%
	<4	1,569,483	2,180,246	2,955,597	3,351,862	2.1%	2.9%	4.0%	4.5%
Panel 3: Homeowners with FRM Mortgages									
		Loan Balance is equal to or greater than...				Loan Balance is equal to or greater than...			
		$200K+	$100k+	$50k+	$1+	$200K+	$100k+	$50k+	$1+
Interest rate is equal to or greater than...	7+	210,433	865,223	1,777,198	2,883,547	0.3%	1.2%	2.4%	3.9%
	6+	435,067	1,794,874	3,787,259	5,768,597	0.6%	2.4%	5.1%	7.8%
	5+	1,685,149	5,028,177	8,538,057	12,031,781	2.3%	6.8%	11.5%	16.3%
	4+	6,959,574	16,769,452	23,867,708	29,038,627	9.4%	22.7%	32.3%	39.3%
	<4	11,241,179	26,322,168	36,871,637	43,563,808	15.2%	35.6%	49.8%	58.9%

Note: Balances in 2016 dollars. N=2,332 homeowners with a mortgage in 2016, excluding farms and mobile homes; N=491 homeowners with pre-2008 mortgages.
Source: JCHS analysis of 2016 Survey of Consumer Finances data.

APPENDIX TABLE A4:

MORTGAGE CHARACTERISTICS FOR SELECTED GROUPS OF HOMEOWNERS

	All Owners	All Mortgaged Owners	All FRM	All ARM	All High-Rate, High-Balance	Pre-2008 High-Rate, High-Balance
Panel 1: Number of Homeowners						
Home Equity						
Negative equity	1,407,438	1,377,205	1,250,930	126,275	603,595	312,753
Equity 0-19%	9,224,421	9,034,232	8,411,393	622,839	2,311,922	545,562
Equity 20% or more	63,334,492	36,634,823	34,032,073	2,602,750	6,334,093	2,481,026
Debt-to-Income Ratios						
Front End Ratio > 30%	7,304,500	6,977,160	6,231,319	745,841	2,413,385	1,167,782
Back End Ratio > 50%	4,451,100	4,004,180	3,506,710	497,470	1,631,795	780,365
Neither	65,922,095	39,626,390	37,068,003	2,558,387	6,711,176	2,147,640
Credit Approvals Past 12 Months						
Application Rejected	6,929,729	5,192,886	4,927,369	265,517	1,210,070	500,806
No App/Expect Rejection	3,351,981	2,185,109	1,950,854	234,255	782,005	345,770
None of the Above	63,684,641	39,668,265	36,816,173	2,852,092	7,257,536	2,492,765
Panel 2: Column Percent						
Home Equity						
Negative equity	1.9%	2.9%	2.9%	3.8%	6.5%	9.4%
Equity 0-19%	12.5%	19.2%	19.3%	18.6%	25.0%	16.3%
Equity 20% or more	85.6%	77.9%	77.9%	77.7%	68.5%	74.3%
Debt-to-Income Ratios						
Front End Ratio > 30%	9.9%	14.8%	14.3%	22.3%	26.1%	35.0%
Back End Ratio > 50%	6.0%	8.5%	8.0%	14.8%	17.6%	23.4%
Neither	89.1%	84.2%	84.8%	76.3%	72.6%	64.3%
Credit Approvals Past 12 Months						
Application Rejected	9.4%	11.0%	11.3%	7.9%	13.1%	15.0%
No App/Expect Rejection	4.5%	4.6%	4.5%	7.0%	8.5%	10.4%
None of the Above	86.1%	84.3%	84.3%	85.1%	78.5%	74.6%
Panel 3: Row Percent						
Home Equity						
Negative equity	100.0%	97.9%	88.9%	9.0%	42.9%	22.2%
Equity 0-19%	100.0%	97.9%	91.2%	6.8%	25.1%	5.9%
Equity 20% or more	100.0%	57.8%	53.7%	4.1%	10.0%	3.9%
Debt-to-Income Ratios						
Front End Ratio > 30%	100.0%	95.5%	85.3%	10.2%	33.0%	16.0%
Back End Ratio > 50%	100.0%	90.0%	78.8%	11.2%	36.7%	17.5%
Neither	100.0%	60.1%	56.2%	3.9%	10.2%	3.3%
Credit Approvals Past 12 Months						
Application Rejected	100.0%	74.9%	71.1%	3.8%	17.5%	7.2%
No App/Expect Rejection	100.0%	65.2%	58.2%	7.0%	23.3%	10.3%
None of the Above	100.0%	62.3%	57.8%	4.5%	11.4%	3.9%

Note: Home equity is defined as a percentage of home value. The front-end ratio is defined as the ratio of monthly mortgage payments to monthly income, and the back-end ratio is defined as the ratio of total monthly debt payments to monthly income, as defined in the SCF's published variables. Debt-to-income ratio figures sum to more than 100 percent because the front end and back end ratio measures are not mutually exclusive. Low rate is defined to include all homeowners with a mortgage interest rate below 5 percent.

Source: JCHS analysis of 2016 Survey of Consumer Finances data.

APPENDIX TABLE A5:

DEMOGRAPHIC CHARACTERISTICS FOR SELECTED GROUPS OF HOMEOWNERS

	All Owners	All Mortgaged Owners	All FRM	All ARM	All High-Rate, High-Balance	Pre-2008 High-Rate, High-Balance
Panel 1: Number of Homeowners						
Age of Householder						
<35	8,735,383	7,390,938	7,280,434	110,504	1,210,332	131,414
35-44	11,583,881	10,037,842	9,511,980	525,862	1,878,570	529,398
45-54	14,956,978	11,472,412	10,507,768	964,644	2,867,137	1,187,704
55-64	16,469,665	10,483,478	9,606,361	877,117	1,895,783	922,384
65+	22,220,444	7,661,590	6,787,853	873,737	1,397,788	568,441
Race/Ethnicity						
White	53,679,981	32,902,957	30,827,336	2,075,620	5,624,526	1,860,174
Black	7,735,583	5,543,770	5,017,612	526,158	1,626,452	666,677
Hispanic	7,283,539	5,003,828	4,671,164	332,664	1,273,991	513,213
Asian/Other	5,267,249	3,595,705	3,178,284	417,421	724,642	299,277
Household Income						
<$25,000	8,906,552	3,288,709	2,963,740	324,969	1,051,889	533,066
$25,000-$49,999	15,684,410	8,404,840	7,844,767	560,073	2,006,879	726,941
$50,000-$99,999	23,853,195	16,045,059	14,884,225	1,160,834	3,053,750	1,243,467
$100,000+	25,522,193	19,307,652	18,001,664	1,305,988	3,137,092	835,867
Education						
< High school diploma	3,859,620	1,667,553	1,579,514	88,040	443,059	99,231
High school diploma	13,355,486	6,174,295	5,728,661	445,634	1,393,124	443,134
Some post-secondary	19,363,196	12,690,668	11,826,693	863,975	3,206,083	1,416,442
4-year degree or more	37,388,049	26,513,744	24,559,529	1,954,215	4,207,344	1,380,534
Net Worth Quintile						
Lowest	2,303,942	2,139,137	2,051,661	87,476	528,102	359,346
Low	7,290,695	6,124,016	5,819,130	304,886	1,742,181	192,167
Middle	18,590,989	12,737,103	11,903,991	833,112	3,143,145	1,320,540
High	22,617,316	13,218,369	12,142,778	1,075,591	2,344,103	935,831
Highest	23,163,409	12,827,635	11,776,836	1,050,799	1,492,080	531,457

Source: JCHS analysis of 2016 Survey of Consumer Finances data.

APPENDIX TABLE A5:

DEMOGRAPHIC CHARACTERISTICS FOR SELECTED GROUPS OF HOMEOWNERS (CONTINUED)

	All Owners	All Mortgaged Owners	All FRM	All ARM	All High-Rate, High-Balance	Pre-2008 High-Rate, High-Balance
Panel 2: Column Percent						
Age of Householder						
<35	12%	16%	17%	3%	13%	4%
35-44	16%	21%	22%	16%	20%	16%
45-54	20%	24%	24%	29%	31%	36%
55-64	22%	22%	22%	26%	20%	28%
65+	30%	16%	16%	26%	15%	17%
Race/Ethnicity						
White	73%	70%	71%	62%	61%	56%
Black	10%	12%	11%	16%	18%	20%
Hispanic	10%	11%	11%	10%	14%	15%
Asian/Other	7%	8%	7%	12%	8%	9%
Household Income						
<$25,000	12%	7%	7%	10%	11%	16%
$25,000-$49,999	21%	18%	18%	17%	22%	22%
$50,000-$99,999	32%	34%	34%	35%	33%	37%
$100,000+	35%	41%	41%	39%	34%	25%
Education						
< High school diploma	5%	4%	4%	3%	5%	3%
High school diploma	18%	13%	13%	13%	15%	13%
Some post-secondary	26%	27%	27%	26%	35%	42%
4-year degree or more	51%	56%	56%	58%	45%	41%
Net Worth Quintile						
Lowest	3%	5%	5%	3%	6%	11%
Low	10%	13%	13%	9%	19%	6%
Middle	25%	27%	27%	25%	34%	40%
High	31%	28%	28%	32%	25%	28%
Highest	31%	27%	27%	31%	16%	16%

Source: JCHS analysis of 2016 Survey of Consumer Finances data.

APPENDIX TABLE A5:

DEMOGRAPHIC CHARACTERISTICS FOR SELECTED GROUPS OF HOMEOWNERS (CONTINUED)

	All Owners	All Mortgaged Owners	All FRM	All ARM	All High-Rate, High-Balance	Pre-2008 High-Rate, High-Balance
Panel 3: Row Percent						
Age of Householder						
<35	100%	85%	83%	1%	14%	2%
35-44	100%	87%	82%	5%	16%	5%
45-54	100%	77%	70%	6%	19%	8%
55-64	100%	64%	58%	5%	12%	6%
65+	100%	34%	31%	4%	6%	3%
Race/Ethnicity						
White	100%	61%	57%	4%	10%	3%
Black	100%	72%	65%	7%	21%	9%
Hispanic	100%	69%	64%	5%	17%	7%
Asian/Other	100%	68%	60%	8%	14%	6%
Household Income						
<$25,000	100%	37%	33%	4%	12%	6%
$25,000-$49,999	100%	54%	50%	4%	13%	5%
$50,000-$99,999	100%	67%	62%	5%	13%	5%
$100,000+	100%	76%	71%	5%	12%	3%
Education						
< High school diploma	100%	43%	41%	2%	11%	3%
High school diploma	100%	46%	43%	3%	10%	3%
Some post-secondary	100%	66%	61%	4%	17%	7%
4-year degree or more	100%	71%	66%	5%	11%	4%
Net Worth Quintile						
Lowest	100%	93%	89%	4%	23%	16%
Low	100%	84%	80%	4%	24%	3%
Middle	100%	69%	64%	4%	17%	7%
High	100%	58%	54%	5%	10%	4%
Highest	100%	55%	51%	5%	6%	2%

Source: JCHS analysis of 2016 Survey of Consumer Finances data.

JCHS JOINT CENTER FOR HOUSING STUDIES OF HARVARD UNIVERSITY

FIVE DECADES OF HOUSING RESEARCH
SINCE 1959