Freddie Mac

Economic & Housing **Research**

Insight & Outlook

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In this Edition:

Insight: Knowledge is Good

Freddie Mac believes objective, unbiased homebuyer education and counseling can improve the ability of borrowers to make prudent homeownership and home financing choices. The benefit is likely to be greatest for first-time homebuyers, and, as a result, Freddie Mac requires financial literacy education for first-time homebuyers who take advantage of Freddie Mac's low-down-payment program, Home Possible Advantage. (p.1)

Outlook: Slower Growth and Lower Mortgage Rates

Housing was one of the few bright spots in the economy last year, and we expect continued improvement in 2016. (p.5)

In Closing: Refinance potential in 2016

Mortgage rates have fallen nearly 20 basis points since last month. By our analysis this means over $100 billion in additional refinance potential is still out for borrowers holding a 30-year mortgage. (p.13)

Summary	2015	2016	2017
Real GDP Growth (%)	1.8	2.0	2.3
CPI (%)	0.4	1.4	1.9
30-year PMMS (%)	3.9	4.1	4.8
Total originations ($B)	1,750	1,580	1,460
Refi share (%)	48	40	24
Total home sales (M)	5.73	5.92	6.16
House price growth (%)	6.2	4.4	3.5

Knowledge Is Good

Introduction

The opening shots of the 1978 film "Animal House" show idyllic scenes of the fictional Faber College. At one point, the camera zooms in on a statue of Emil Faber, the founder of the college. The inscription on the base of the statue displays Faber's motto: Knowledge Is Good.

While Faber's motto is vacuous — and a tip-off for what is to come in the rest of the movie — knowledge is not only good but it is essential when making complex financial decisions. And deciding whether or not to purchase a home is one of the most complex financial decisions most people make. First-time homebuyers, in particular, may be overwhelmed by the sheer number of things to learn. How much house can they afford? Will they qualify for a mortgage? What type of mortgage is best for them? What about mortgage insurance, title insurance, appraisals, flood certifications, and on and on? Would they be better off continuing to rent?

Where can potential homebuyers find help? Of course, there are many experienced professionals involved in the purchase to whom they can turn. However, as we saw in the run-up to the housing crisis, many borrowers did not receive or did not act on the information they needed. What buyers need is unbiased and authoritative information about the homebuying and — just as important — loan-paying processes in order to make informed decisions.

Many organizations offer this type of information. For example, My Home by Freddie Mac℠ provides information on renting, owning a home, refinancing a mortgage, and dealing with the possibility of foreclosure. In fact, Freddie Mac believes this type of objective information is so important that it

requires first-time homebuyers taking advantage of Home Possible Advantage®, our low-down-payment product, to participate in a financial literacy education program.

How much does borrower education and counseling help potential homebuyers? It has been surprisingly difficult to answer this question. During the housing crisis, it became apparent that many borrowers had ended up with debt burdens and exotic mortgages that led them into financial distress. There is widespread agreement in the industry that homebuyer counseling can help prevent some of the mistakes made during the housing boom. However, early studies of the impact of counseling produced sometimes conflicting or inconclusive results and raised questions about the effectiveness of borrower education and counseling.

Measuring the effectiveness of counseling

Over the years, there have been several studies of the effectiveness of pre-purchase homeownership counseling. For example, Hirad and Zorn reviewed data on 40,000 participants in Freddie Mac's Affordable Gold Loans program and concluded that borrowers who received classroom and home study counseling had reductions in their subsequent rates of serious delinquency of 26 percent and 21 percent, respectively. Borrowers who received individual counseling averaged a 34 percent reduction in their rate of serious delinquency.

In contrast, a study by Quercia and Spader, which is based on a different program that required borrowers to participate in a homeownership education and counseling (HEC) component found"no evidence that HEC completion reduces default." And studies by Agarwal, et al., and by Birkenmaier and Tyuse came to mixed conclusions.

This lack of a definitive consensus is a common problem in social research. Social scientists must rely for the most part on observational data, that is, data available from observations of uncontrolled, ordinary activity. For instance, researchers might estimate the impact of pre-purchase counseling by comparing the delinquency rates of a group of borrowers that received counseling to a group that didn't receive counseling. While the counseled borrowers may have lower average delinquency rates than the borrowers in the uncounseled group, it's not immediately clear that the counseling accounts for the entire difference in delinquency rates. Perhaps the borrowers who received counseling also were more highly-educated than the borrowers in the other group. Maybe they had a greater disposition or ability to apply the information provided by the education course. Maybe they had higher credit scores than the other borrowers.

All the researchers in the studies cited above were aware of the challenges to basing conclusions on observational data, and they went to great lengths to insulate their inferences from these types of confounding factors. Nonetheless, there are limits to what can be concluded from observational data. One way to overcome these limitations is to use experimental data rather than observational data.

Experimental data divides participants into a treatment group and a control (that is, untreated) group in such a way that any difference in outcomes between groups is most likely to be a result of the treatment rather than some other, uncontrolled difference in the characteristics of the two groups. Individuals can be assigned randomly to each group, reducing the chance that, for example, people with higher credit scores are likelier to receive counseling. Alternatively, the treatment and control groups can be constructed to be as similar as possible — the same shares of college graduates, the same shares of men, the same shares of high-FICOs, etc.

The advantages to the researcher of experimental data are obvious, but it's not often available in social research for a variety of reasons:

- Experiments are expensive. Potential subjects have to be located and induced to participate in the experiment, sometimes by paying them. Subjects often have to be monitored over long periods of time. For example, since

mortgage delinquencies typically don't begin to appear until several years into the life of a loan, it takes many years to assess the impact of counseling;

- People willing to participate in an experiment may be different from those who are unwilling to participate. And some participants drop out of the experiment before its conclusion. Both factors reintroduce some of the problems of observational data;
- In some cases, it may be unethical to offer a beneficial treatment to some participants but not to others. This problem is more frequent in medical research, but it does occur in some social research.

A final problem that affects both observational and experimental studies is clearly defining the effect. For example, how can we assess the effectiveness of, say, a smartphone app that promises to increase your intelligence? We can't observe intelligence directly. We can measure changes in a variety of IQ and related tests. We can measure changes in performance on specific tasks, like remembering random number sequences. But it's not clear that we're observing changes in intelligence.

Similarly, it can be difficult to clearly define the expected benefit of pre-purchase homeownership counseling. Do we expect that potential homeowners who receive counseling will be more likely to purchase a home or take on debt? Or do we expect that they will rent for a longer period to build up sufficient cash reserves? Do we expect their credit scores to increase as they manage their credit more effectively? It's tough to say.

A controlled experiment

In 2014, the Federal Reserve Bank of Philadelphia published the results of a five-year study of the effectiveness of pre-purchase homeownership counseling and financial management skills. In contrast to prior studies, this effort employed an experimental design to overcome the challenges facing the earlier studies that relied on observational data. Only first-time homebuyers were included in the study, and the participants could not previously have applied for a mortgage, received pre-purchase homeownership counseling, have a contract to purchase a home, or already be in a program that required pre-purchase counseling. Participants were randomly assigned to either a treatment group or a control group.

Both the treatment and the control group received a two-hour pre-purchase workshop. The treatment group also received additional one-on-one counseling. The control group received no additional counseling or education services.

The two-hour workshop included information on

- Preparing for homeownership (advantages/disadvantages, affordability),
- Shopping for a house,
- Shopping for a mortgage,
- Applying for a mortgage, and
- Closing and settlement.

In addition, workshop participants received a workbook that contained additional information.

The treatment group received individual guidance on budgeting and their homebuying effort plus any other services offered by the counseling agency, as needed. Twenty-nine percent of the participants in the treatment group opted to use some of these extra services.

All the counselors were required to attend training designed to ensure that the workshops and individual counseling provided consistent information to all participants.

Participants in both groups were tracked for four years after their initial assistance. Credit reports and scores for each participant were obtained annually, and annual follow-up surveys were conducted to track a variety of changes in the participants' situations.

Results of the experiment

As we noted above, it's not immediately clear how best to measure the impact of pre-purchase homeownership education and counseling. The researchers in the Philadelphia Fed study chose to measure potential impacts on credit scores; total debt balance on trade lines (that is, auto loan balances, credit card balances, and similar non-mortgage debt balances); and delinquent payments on financial obligations.

Exhibit 1 compares the change in average credit score of the control group — the group that received just the two-hour workshop — to the change in the average score of the treatment group — the group that received individual counseling in addition to the two-hour workshop. The control group had an average increase of 8.5 points in their credit score. The treatment group enjoyed an even-larger 16.2 point increase in average credit score. Both of these increases are statistically significant. However, the 7.7 point difference in the credit score increase in the two groups is not statistically significant. The results in Exhibit 1 suggest that the two-hour workshop had a beneficial impact on all participants' management of their credit. Individual counseling may have provided an incremental benefit, but the evidence of benefit is strongest for the two-hour workshop.

Exhibit 1: Change in credit score, all participants

	Control	Treatment	Difference
Change in credit score	8.5	16.2	7.7

The lack of a statistically significant difference between the treatment and control groups may simply reflect the limited size of the sample. The high cost of experimental studies tends to limit the number of participants compared to studies of observational data. As it happens, the Philadelphia Fed study included fewer than 1,000 participants. Compare that to the 40,000 participants in the Hirad and Zorn study.

Over the course of the five-year experiment, some, but not all, participants in both groups purchased homes. Exhibit 2 compares the changes in credit score, total non-mortgage debt, and delinquency separately for non-homeowners and homeowners. The purchase of a home may signal some unobserved difference in the financial situation, financial sophistication, or risk tolerance of the participants. Separate comparisons of non-homeowners and homeowners guard against the influence of these types of unobserved differences.

Exhibit 2: Impacts of counseling by homeownership status

		Non-homeowners			Homeowners		
		Control	Treatment	Difference	Control	Treatment	Difference
Change in credit score		8.6	**16.3**	7.7	8.3	**16.1**	7.8
Change in total debt ($)		396	2138	1,742	-1,447	**-3109**	1662
Change in share delinquent	30 days	0.2	**-2.2**	**2.4**	**-0.7**	**-1.5**	**0.8**
	60 days	0.1	-0.3	**0.4**	0.0	-0.6	**0.6**
	90 days	-1.1	-1.1	0.0	-0.2	-0.9	**0.7**

Statistically significant impacts and differences are highlighted in Exhibit 2. For instance, the changes in average credit score are statistically significant for the treatment group (16.3 points for non-homeowners, 16.1 points for homeowners). However the impacts on the control group and the differences in impact across the groups are not statistically significant. This pattern of results may seem a little confusing. After all, Exhibit 1 shows the same pattern of impacts on average credit score, but in Exhibit 1 the impacts are statistically significant for both the control and treatment groups. However dividing the experiment participants into non-homeowners and homeowners in Exhibit 2 decreases the size of the groups, and, as we noted above, it is more difficult to identify statistically significant impacts and differences in smaller groups.

The changes in total non-mortgage debt display an intriguing pattern. Non-homeowners increased their total debt over the course of the experiment, and the treatment group increased their debt more than the control group. In contrast, homeowners decreased their total debt, and the treatment group decreased their debt more than the control group. (Only the $3,109 decrease in debt by homeowners in the treatment group is statistically significant.) Perhaps non-homeowners felt able to increase their non-mortgage debt because they didn't face the debt burden of a mortgage. Conversely, homeowners may have pared back non-mortgage debt in anticipation of buying a home and taking on a mortgage.

There is some evidence that the individual counseling produced a statistically significant reduction in future delinquency especially among homeowners.

Conclusion

Freddie Mac believes objective, unbiased homebuyer education and counseling can improve the ability of borrowers to make prudent homeownership and home financing choices. The benefit is likely to be greatest for first-time homebuyers, and, as a result, Freddie Mac requires financial literacy education for first-time homebuyers who take advantage of Freddie Mac's low-down-payment program, Home Possible Advantage.

The Philadelphia Fed's five-year experiment supports Freddie Mac's belief in the benefits of pre-purchase homeownership counseling. The two-hour workshop provided to all participants produced statistically significant increases in credit scores. Both the workshop and the individual counseling provided to the treatment group reduced future delinquencies, especially among homeowners. The experimental design employed by the Philadelphia Fed addresses some of the challenges faced by non-experimental studies and increases confidence in earlier research that documented the benefits of both homeownership education and counseling.

Outlook: Slower growth and lower mortgage rates

The pace of growth in the U.S. slowed to a crawl in the last quarter of the year, raising questions about how much life is left in this aging expansion. In addition, expectations of global growth continued to ratchet down. The market volatility in the first two months of 2016 only heightened concerns about the health of the world economy and probably forestalled any further monetary tightening by the Fed until June.

- Real growth in the U.S. slowed to 0.7 percent in the fourth quarter according to the advance estimate released by the Bureau of Economic Analysis. In January, the International Monetary Fund estimated the world economy grew 3.1 percent in real terms in 2015, and it lowered its previous projections for 2016 and 2017 to 3.4 percent and 3.6 percent, respectively.
- Inflation remained low. Growth in the GDP deflator dropped from 1.3 percent in the third quarter to 0.8 percent in the fourth quarter. Other broad-based measures of inflation and inflation expectations remain subdued.

- The unemployment rate dipped a tenth of a percent in January to 4.9 percent. The labor force participation rate, though a bit higher than in December, remained below 63 percent. Nonfarm payrolls increased by 151,000 new jobs in January, 128,000 fewer than the average increase in the fourth quarter of 2015. However, wage growth picked up in January. Average hourly earnings increased 0.5 percent to $25.39.

In light of this lackluster economic performance and the recent financial market turbulence, we have lowered our real growth projections to 2.0 percent in 2016 and 2.3 percent in 2017. We also expect the unemployment rate to average 4.9 percent and 4.8 percent in 2016 and 2017, respectively. We anticipate CPI inflation will average 1.4 percent in 2016 and 1.9 percent in 2017.

A flight-to-quality triggered by recent turbulence in financial markets has pushed Treasury yields lower so far this year. Tepid real growth and a strengthening U.S. dollar will continue to restrain yields going forward. Accordingly, we have lowered our projections of both Treasury yields and mortgage rates. We now expect the 30-year mortgage rate to average 4.1 percent in 2016 and 4.8 percent in 2017.

Housing was one of the few bright spots in the economy last year, and we expect continued improvement in 2016. The imbalance between demand for housing and the supply of both houses and apartments has supported rapid growth in both house prices and rents. The gap between demand and supply will not be closed any time soon, thus we project continued house price appreciation in 2016. Rent growth will begin to moderate in selected metros as new units come on the market; however rent growth will remain above long-term averages this year. Persistently low mortgage rates will facilitate house purchases and refinances, although refinance volume may tail off if the Fed resumes monetary tightening later this year.

Some recent housing indicators worth noting:

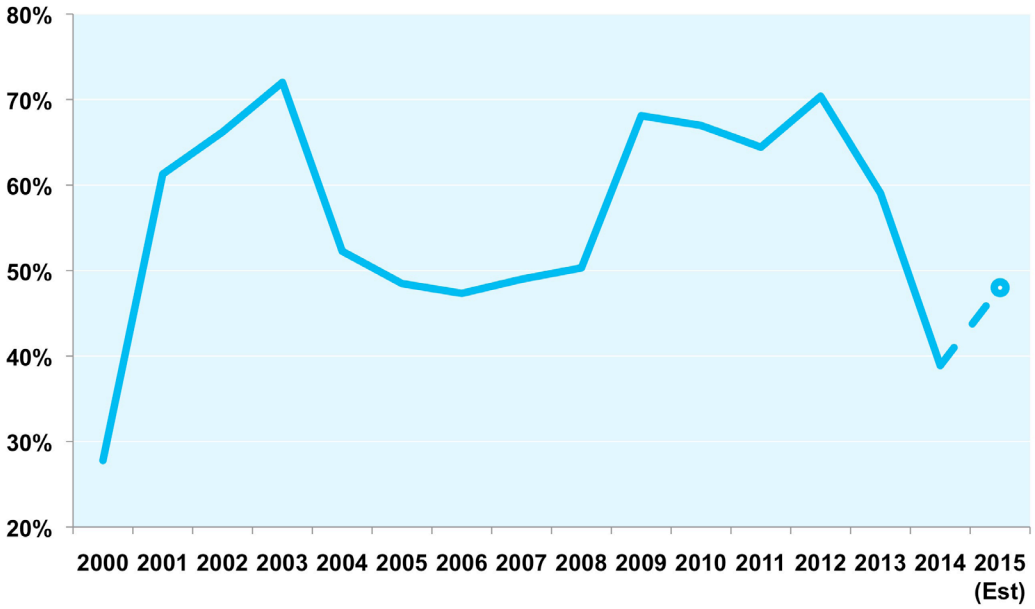
- The resurgence in home sales continued in January as existing-home sales increased. The National Association of Realtors' February release showed existing-home sales went from a seasonally adjusted annual rate of 5.45 million in December to 5.47 million in January, beating analyst expectations. January's figures also represent year-over-year growth at 11 percent.
- The Commerce Department reported that January had a 9.2 percent monthly drop in new residential sales (5.2 percent below January 2015), which is still keeping in line with a steady growth trend. Looking at total housing inventory, there was a 3.4 percent increase from December and a 4-month supply of unsold inventory at the current sales pace. With a typical surge in homebuying activity set to begin in the spring, the increase in inventory will not be enough to counter home price appreciation that showed 8.2 percent yearly growth for existing-home sales.
- Housing starts fell 3.8 percent in January according to the U.S. Department of Commerce. Some of this decline was weather-related. However, the Housing Market Index published by the National Association of Home Builders fell to its lowest reading since May 2015, indicating labor and property shortages are preventing builders from catching up to the demand for new homes.

The combination of low mortgage rates and increases in home equity will incent some additional refinances in 2016. As a result, we are raising our refinance projection share of originations to 40 percent. In last month's Outlook, we reviewed potential sources of refinance originations in 2016. In this month's In Closing, we refine our estimates further.

Cash-out Refinance Volume Increases

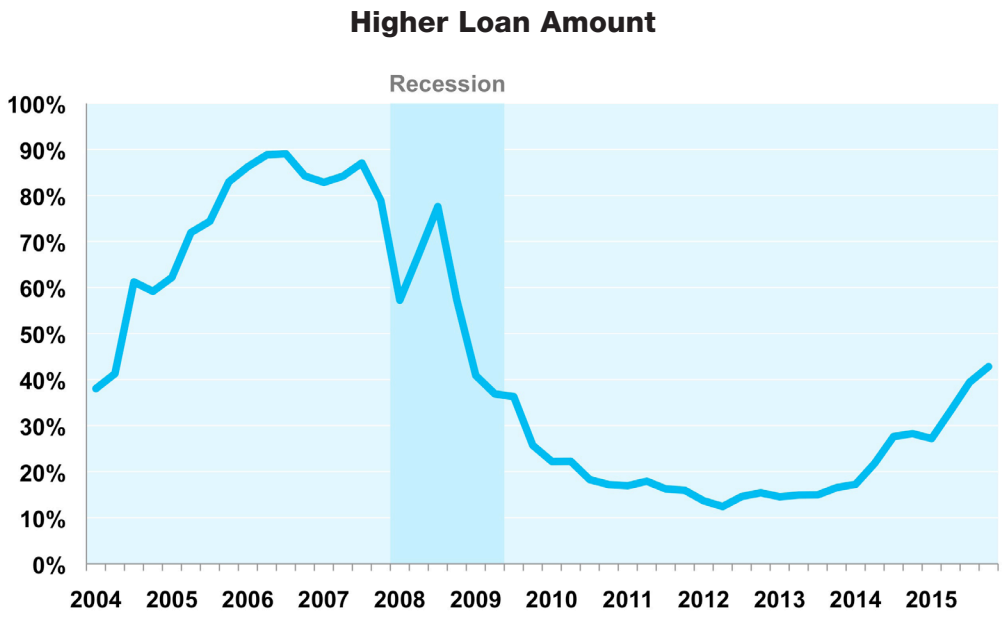
Refinances made up 50 percent of Freddie Mac's fundings ($76 billion) in the last quarter of 2015. Mortgage rates remained within a 25 basis point range in the fourth quarter and dipped to within 17 basis points of the low for the year, providing support for continued refinance activity.

Total Single-Family Refinance Share



Source: HMDA data, Freddie Mac. HMDA data includes – One to four-family and manufactured housing originations; purchase, refinance and home improvement. 2015 refinance share is Freddie Mac's Economic and Housing Research group estimate, February 2016 Economic Outlook.

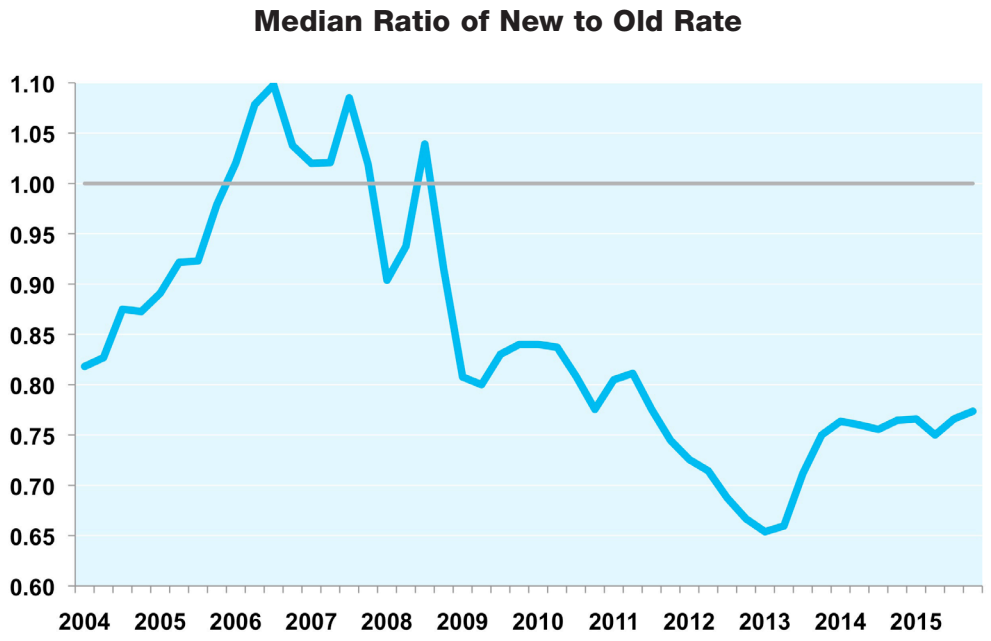
Freddie Mac's share of cash-out borrowers, defined as those who increased their loan balance by at least 5 percent, increased four percentage points to 43 percent. (This estimate is calculated for borrowers where both the existing and new loans were funded by Freddie Mac.) This represents the highest share of cash-out refinances since 2008. Prior to 2009, the share of cash-outs ranged from 32 percent to 89 percent (in 2006) and averaged 64 percent of all refinances. During the Great Recession, cash-outs plummeted as house prices collapsed. The share of cash-outs hit a low of 12 percent in the second quarter of 2012 and didn't rise above 20 percent for the next two years. Starting in 2014, the share of cash-out refinances has risen gradually but remains well below the pre-recession historical average.



Source: Freddie Mac fourth quarter Refinance Report. "Higher Loan Amount" refers to loan amounts that were at least 5 percent greater than the amortized unpaid principal balance (UPB) of the original loan

Term and product changes

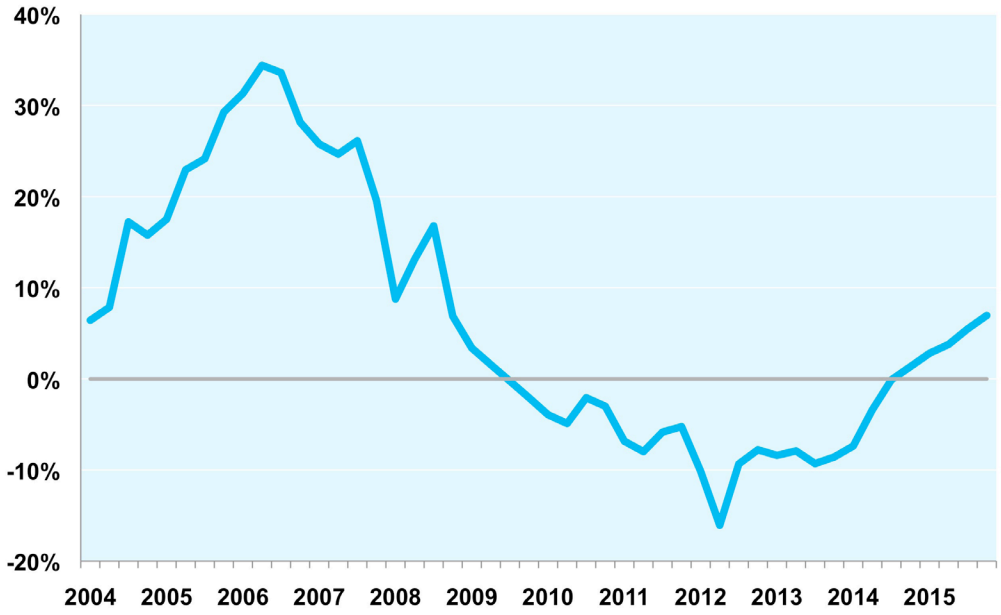
Borrowers cut their mortgage rate by 110 basis points on average, or a 23 percent rate-reduction — in the fourth quarter. This rate reduction is high by historical standards; the average reduction is 13 percent. Rate reductions tend to be greater in periods of limited cash-outs. Conversely, periods of high cash-outs, such as 2006 and 2007, often are associated with refinances that increase note rates.



Source: Freddie Mac fourth quarter Refinance Report. Ratio of new to old rate refers to the ratio of the interest rate of the new loan to the interest rate of the refinanced loan. Refinanced loans with adjustable-rate products are excluded.

More than 95 percent of refinancing borrowers chose a fixed-rate loan. Fixed-rate loans were preferred regardless of the type of the original loan. For example, 83 percent of borrowers with hybrid ARMs chose fixed-rate loans in the fourth quarter. Only 17 percent chose to refinance into another hybrid ARM.

Median Appreciation of Refinanced Property



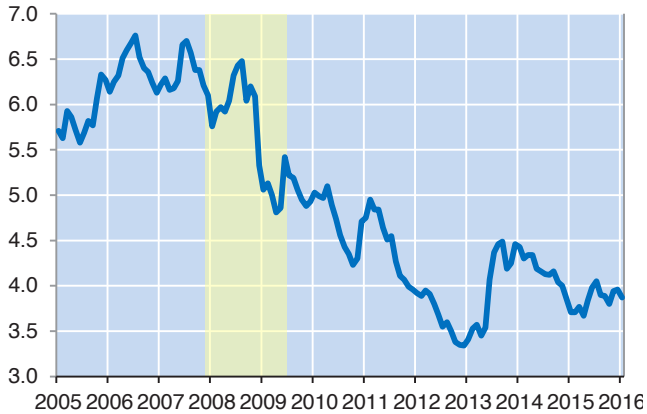
Source: Freddie Mac fourth quarter Refinance Report.

The median house price appreciation from origination of the existing loan to the refinance was 7 percent. Prior to the fourth quarter 2009, the median appreciation among refinancers had never been negative. The median house price among refinancers declined every quarter for the subsequent 19 quarters. The final quarter of 2015 marked the fifth consecutive quarter with positive median appreciation and it also posted the highest appreciation of those five quarters. However, this 7 percent appreciation lies far below the pre-2009 average of 16 percent, those periods from the first quarter of 1994 to the fourth quarter of 2008.

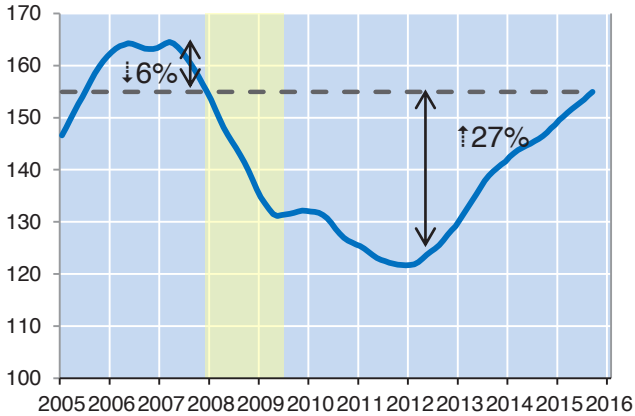
See the Full Year 2015 Refinance Statistics for more information.

Housing Snapshot: A selection of key indicators

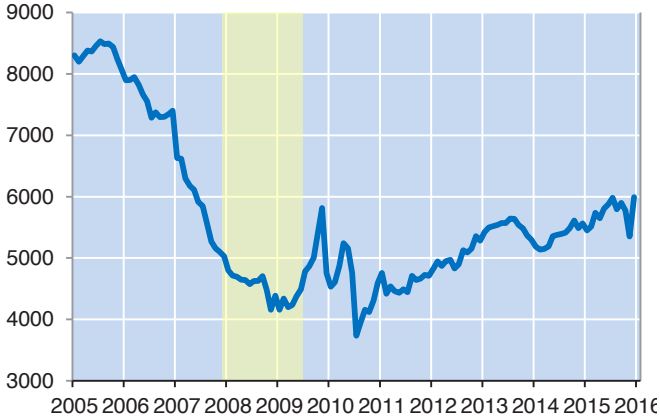
30-yr Fixed Mrtg Rate (%)



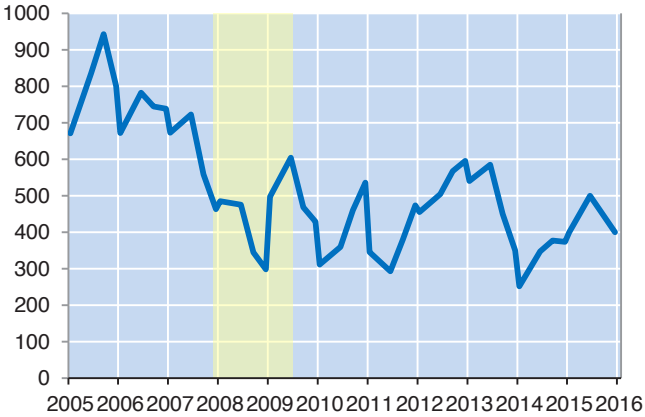
Freddie Mac House Price Index



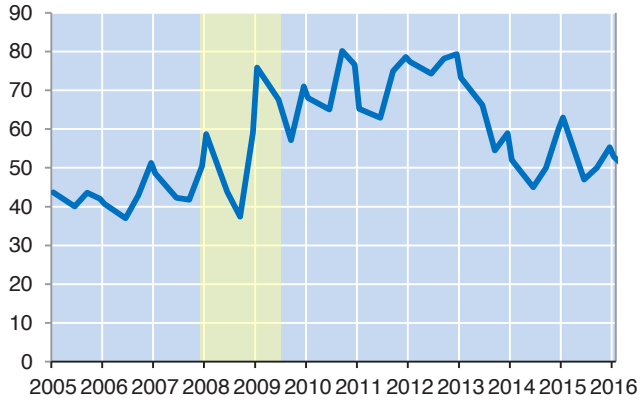
Total Home Sales (Ths., SAAR)



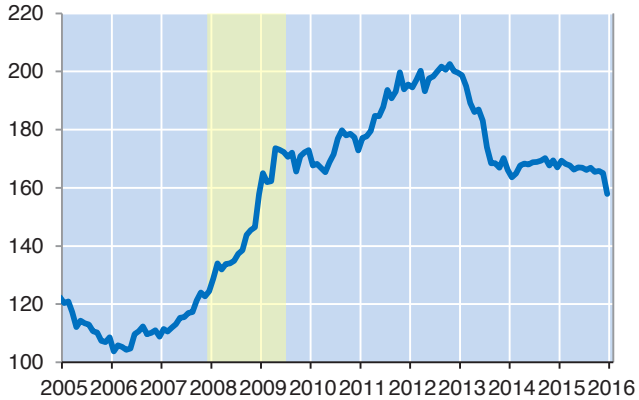
SF Mortgage Originations ($ Bil.)



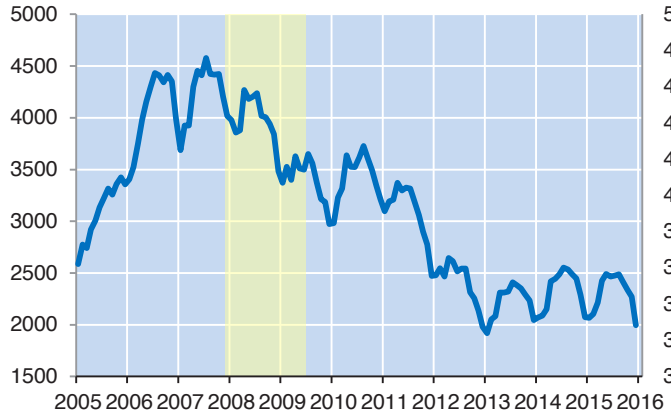
Refinance Share (% of UPB)



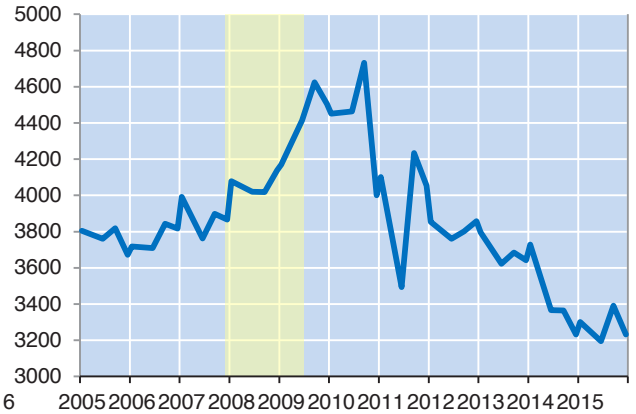
NAR Affordability Index



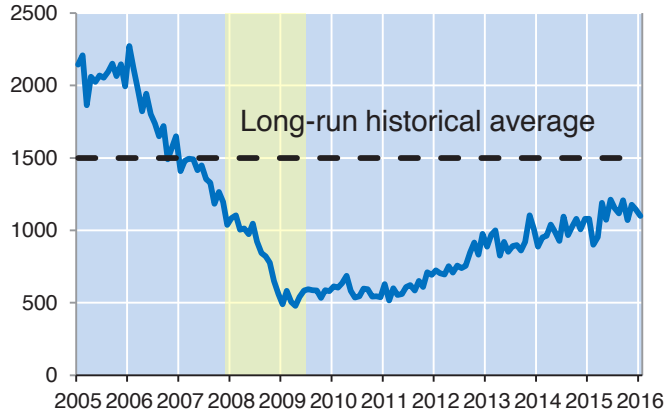
Homes for sale (Ths., NSA)



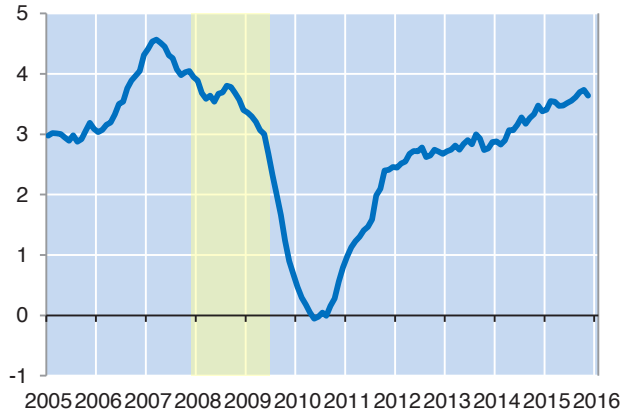
Homes for rent (Ths., NSA)



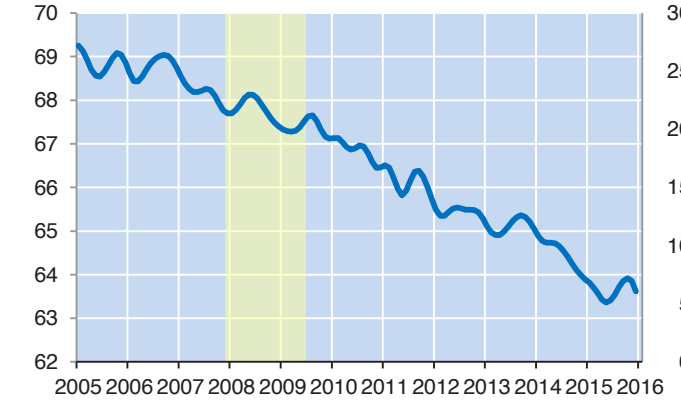
Housing Starts (Ths., SAAR)



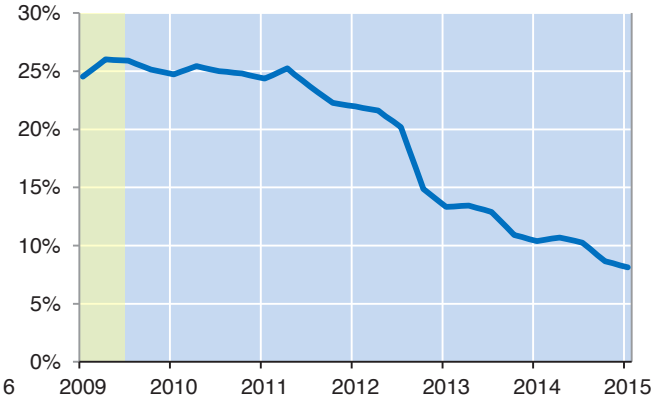
Rent of Primary Residence *(YoY %)*



Total Homeownership Rate (%)



Negative Equity Share



Sources: Freddie Mac, BLS, HMDA, NAR, US Census Bureau, FHFA, CoreLogic

February 2016 Economic and Housing Market Outlook

Revised 2/22/2016

Indicator	2015 Q1	2015 Q2	2015 Q3	2015 Q4	2016 Q1	2016 Q2	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3	2017 Q4	Annual Totals 2012	2013	2014	2015	2016	2017
Real GDP (%)	0.6	3.9	2.0	0.7	1.8	2.2	2.0	2.2	2.3	2.3	2.3	2.3	1.3	2.5	2.5	1.8	2.0	2.3
Consumer Prices (%) a.	-3.1	3.0	1.6	0.2	0.0	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.2	1.2	0.4	1.4	1.9
Unemployment Rate (%) b.	5.6	5.4	5.2	5.0	4.9	4.9	4.9	4.8	4.8	4.8	4.7	4.7	8.1	7.4	6.2	5.3	4.9	4.8
30-Year Fixed Mtg. Rate (%) b.	3.7	3.8	4.0	3.9	3.8	3.9	4.2	4.4	4.5	4.7	4.9	5.1	3.7	4.0	4.2	3.9	4.1	4.8
5/1 Hybrid Treas. Indexed ARM Rate (%) b.	2.9	2.9	2.9	3.0	2.9	3.1	3.4	3.6	3.9	4.1	4.3	4.5	2.8	2.9	3.0	2.9	3.3	4.2
10-Year Const. Mat. Treas. Rate (%) b.	2.0	2.2	2.2	2.2	2.0	2.2	2.4	2.6	2.7	2.9	3.1	3.3	1.8	2.4	2.6	2.2	2.3	3.0
1-Year Const. Mat. Treas. Rate (%) b.	0.2	0.3	0.3	0.5	0.5	0.6	0.8	1.0	1.2	1.4	1.6	1.8	0.2	0.1	0.1	0.3	0.7	1.5

Indicator	2015 Q1	2015 Q2	2015 Q3	2015 Q4	2016 Q1	2016 Q2	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3	2017 Q4	Annual Totals 2012	2013	2014	2015	2016	2017
Housing Starts c.	0.98	1.16	1.16	1.13	1.23	1.28	1.33	1.38	1.43	1.48	1.53	1.58	0.78	0.92	1.00	1.11	1.31	1.51
Total Home Sales d.	5.49	5.79	5.96	5.69	5.81	5.91	5.91	6.06	6.11	6.16	6.16	6.21	5.03	5.52	5.38	5.73	5.92	6.16
FMHPI House Price Appreciation (%) e.	1.6	1.3	1.4	1.8	1.3	1.1	0.9	1.0	0.9	0.9	0.9	0.8	6.2	9.5	5.0	6.2	4.4	3.5
1-4 Family Mortgage Originations f.																		
Conventional	$320	$390	$328	$302	$250	$351	$317	$286	$285	$299	$261	$246	$1,750	$1,570	$1,091	$1,340	$1,205	$1,091
FHA & VA	$80	$110	$122	$98	$70	$109	$103	$94	$95	$101	$89	$84	$372	$355	$259	$410	$375	$369
Total	$400	$500	$450	$400	$320	$460	$420	$380	$380	$400	$350	$330	$2,122	$1,925	$1,350	$1,750	$1,580	$1,460
Refinancing Share - Originations (%) g.	52	45	45	50	48	44	37	33	27	25	23	22	70	59	39	48	40	24
Residential Mortgage Debt (%) h.	-0.3	2.6	2.7	2.7	2.7	3.5	3.7	4.0	4.0	4.0	4.0	4.0	-1.8	-0.5	0.7	1.9	3.5	4.0

Note: Quarterly and annual forecasts are shown in shaded areas; totals may not add due to rounding; quarterly data expressed as annual rates.
Annual forecast data are averages of quarterly values; annual historical data are reported as Q4 over Q4.

a. Calculations based on quarterly average of monthly index levels; index levels based on the seasonally-adjusted, all-urban consumer price index.
b. Quarterly average of monthly unemployment rates (seasonally-adjusted); Quarterly average of monthly interest rates (not seasonally-adjusted).
c. Millions of housing units; quarterly averages of monthly, seasonally-adjusted levels (reported at an annual rate).
d. Millions of housing units; total sales are the sum of new and existing single-family homes;quarterly averages of monthly, seasonally-adjusted levels (reported at an annual rate).
e. Quarterly growth rate of Freddie Mac's House Price Index; seasonally-adjusted; annual rates for yearly data.
f. Billions of dollars (not seasonally-adjusted); conventional for 2014 are Freddie Mac estimates.
g. Home Mortgage Disclosure Act for all single-family mortgages (not seasonally-adjusted); annual share is dollar-weighted average of quarterly shares (2014 estimated).
h. Federal Reserve Board; growth rate of residential mortgage debt, the sum of single-family and multifamily mortgages (not seasonally-adjusted, annual rate).

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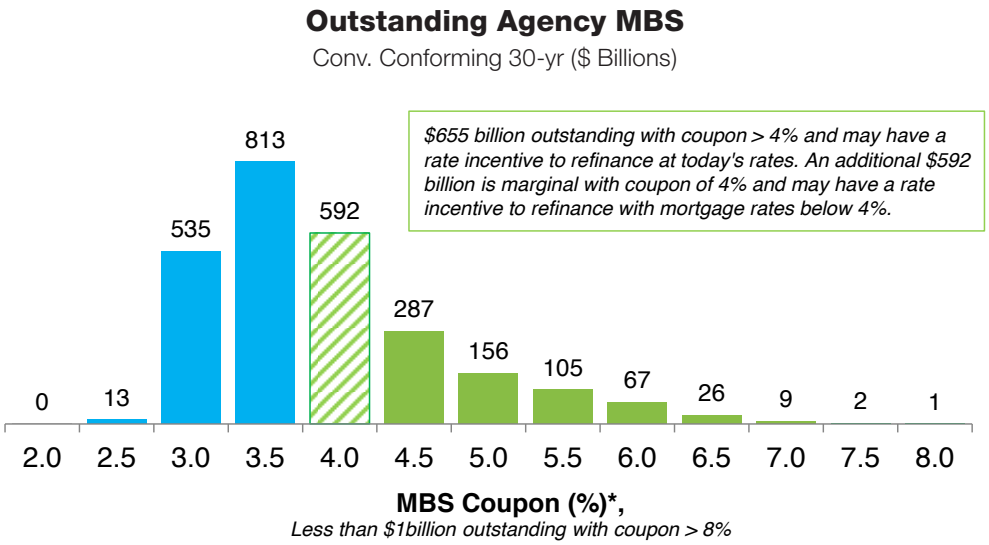
In Closing: Refinance potential in 2016

In last month's Insight & Outlook, we noted there is about $655 billion in outstanding conventional 30-year MBS with a coupon greater than 4 percent. This figure provides a rough upper bound on the potential rate refinance volume in 2016 from conventional conforming 30-year loans in agency MBS[1], assuming rates remain above 4 percent.



Source: Bloomberg Dec 2015

Realistically, some of these loans are unlikely to be refinanced this year despite the potential reduction in interest rate. The 30-year mortgage rate remained below 4 percent from December 2011 through mid-2013 (with one exception—the rate touched 4.08 percent in the week of March 22, 2012). Since mid-2013, the 30-year mortgage rate never exceeded 4.58 percent. Thus conventional loans with note rates higher than, say, 5 percent have passed on favorable opportunities to refinance for at least 2-1/2 years.

Loans (and borrowers) that ignore extended refinance opportunities are said to be burned out, and market analysts assume these loans have a low probability of refinancing in the future, regardless of the level of mortgage rates. Burn out can be explained by events that reduce the borrower's credit score. These events can include significant delinquencies on their existing mortgage or other consumer debt or a job loss or health setback that limits their earning ability. Some borrowers may have paid the balance of their existing loan down to the point that the transactions costs of a refinance outweigh the benefit of a lower interest rate. And some borrowers may be averse to applying for a refinance, perhaps because the fear they will be turned down.

In the wake of the housing crisis, there is another possible reason for burnout: house price declines. House prices declined 27 percent nationally from the peak in June 2006 to the trough in January 2012, and the declines were much more severe in some areas. Some of these apparently burned out loans may simply have been too far underwater to permit a refinance when mortgage rates were at their lowest. If so, these loans may not be burned out at all. House prices nationally are nearing the June 2006 peak, and, in some areas, house prices already are above the previous peak.

These borrowers may wake up to their refinance opportunity this year, especially as recent house price gains are trumpeted in the press. An approach to estimating the rate refinance potential in 2016 is to start with the $655 billion in high-note-rate loans, then subtract loans that may not be able to refinance because of delinquencies, currently-high

LTV, or a previous HARP refinance. Based on analysis of Freddie Mac's own data on 30-year conventional conforming fixed-rate mortgage loans we constructed the table below to capture our estimate of non-burned out loans.

30-yr Conventional Conforming FRM Rate Refinance Potential[2]	
Outstanding Conventional 30-yr MBS (>4% coupon)[2]	$655
Less:	
Delinquencies[3]	-$65
Currently-high LTV (HARP potential)[4]	-$35
Previous HARP Refinance[5]	-$30
Burn Out[6]	-$420
Rate Refinance Potential	$105

Delinquency: Despite the fact that mortgage delinquency rates have come down significantly from their peak levels, they still remain high relative to historical averages in many markets. The negative impact of a delinquency on a borrower's credit score may prevent borrowers from being able to qualify for a refinance loan. We estimate that about $65 billion (10 percent) of the $655 billion of the loans in outstanding MBS with coupon greater than 4 percent would have difficulty refinancing due to having missed a payment within the past twelve months.

Currently-high LTV: Borrowers may simply be too far underwater to permit a refinance without bringing significant cash to closing. Some of these borrowers can take advantage of the HARP program. FHFA estimates that there are more than 367,000 borrowers nationwide still have a financial incentive to refinance through HARP before the program expires in December 2016. We estimate that about $35 billion (5 percent) of the loans in outstanding MBS with coupon greater than 4 percent have not missed a payment in the last year and have current LTV of 90 or greater. Many of these loans would be HARP eligible.

Previous HARP refinance: Some borrowers that are currently underwater are unable to use the HARP program because they have previously used the HARP program. For borrowers who used HARP early on near the program's inception, they may have a note rate over 100 basis points higher than the current mortgage rate. However, one of the conditions of HARP is that a borrower is not allowed to HARP refinance twice. They will need to see solid house price appreciation to be able to "UnHARP" into a regular (non-HARP) loan. We estimate that about $30 billion (4.6 percent) of the loans in outstanding MBS with coupon greater than 4 percent have already taken out a HARP loan and have a current LTV of 90 or above.

Burn Out Of the remaining loans (not delinquent, not currently high LTV) a significant fraction are burned out. That is, they have passed up an opportunity to refinance in the recent past and are unlikely to refinance despite recent rate declines. We estimate that about $420 billion (64 percent) of the loans in outstanding MBS with coupon greater than 4 percent have not missed a payment in the last year, have current LTV of 80 or less, and met those same conditions one year ago; they are burned out.

Subtracting off recently delinquent loans, currently-high LTV (both HARP and non-HARP) and burned out loans leaves approximately $105 billion in rate refinance potential from the $655 billion we started with. Our current forecast for 2016 refinance volume is $637 billion.

Of course, not all refinance originations will come from loans in 30-year agency securities and not all refinances will come from the desire to lower the rate on the mortgage (rate refinance). We also have term refinances (refinances that result in a shorter or longer loan term, e.g. 30-year to 15-year term), and cash-out refinances. This estimate does not include other mortgage products including loans guaranteed by FHA, VA or RHS, and loans held in portfolio, including Jumbo loans.

Since the last Insight and Outlook, mortgage rates have continued to tumble, falling nearly 20 basis points. Lower mortgage rates will increase the number of borrowers who have rate incentive to refinance. There were $592 billion of loans conventional conforming 30-year agency MBS that had a coupon of 4 percent in December of 2015. Using the same approach as described above, we estimate that about $122 billion (21 percent) would have rate incentive to refinance with rates below 4 percent, would not be constrained by a recent delinquency or high current LTV and would not have burned out.

Marginal 30-yr Conventional Conforming FRM Rate Refinance Potential[7]	
Outstanding Conventional 30-yr MBS (4% coupon)[8]	$592
Less:	
Delinquencies[9]	-$15
Currently-high LTV (HARP potential)[10]	-$35
Previous HARP Refinance[11]	-$30
Burn Out[12]	-$390
Rate Refinance Potential	$122

1 As we note below, there is significant other volume that could refinance. The $655 billion excludes 15-year and 20-year fixed rate mortgages, loans guaranteed by FHA, VA, or the RHS, and loans not held in agency securities (including Jumbo loans). We also do not account for possible cash-out refinances, consolidation of debt—including second liens—and product transitions (shortening or lengthening in loan terms).

2 Using Freddie Mac data as of Dec. 31, 2015, we looked at 30-yr FRM with a high-rate note (>4.5 percent).

3 Data source: Bloomberg as of Dec 2015

4 Loans that have been delinquent (30 days late) at least once within the past year

5 Loans that have a current LTV of 90 or above

6 Loans that have a current LTV of 90 or above and have already done a HARP refinance

7 Loans that have had a current LTV under 80 for more than a year and have not been recently delinquent

8 Using Freddie Mac data as of Dec. 31, 2015, we looked at 30-yr FRM with a note between 4.0% and 4.5%.

9 Data source: Bloomberg as of Dec 2015

10 Loans that have been delinquent (30 days late) at least once within the past year

11 Loans that have a current LTV of 90 or above

12 Loans that have a current LTV of 90 or above and have already done a HARP refinance

13 Loans that have had a current LTV under 80 for more than a year and have not been recently delinquent

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