

A Snapshot of Mortgage Conditions with an Emphasis on Subprime Mortgage Performance

Scott Frame
Federal Reserve Bank of Atlanta

Andreas Lehnert
Board of Governors of the Federal Reserve System

Ned Prescott
Federal Reserve Bank of Richmond¹

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Abstract

This document provides facts and figures that pertain to the recent increase in mortgage foreclosures. The data are provided to help readers understand the source, scope, and scale of this increase. Emphasis is placed on the subprime portion of the market because it accounts for 53 percent of all foreclosures, while only comprising 12 percent of first-lien mortgages. Section 1 describes the characteristics and size of the residential mortgage market; Section 2 describes mortgage performance; Section 3 describes the subprime portion of the market; and Section 4 describes household mortgage choice.

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Section 1: The Residential Mortgage Market

The U.S. residential mortgage market is estimated to include 54.7 million loans with a value of approximately \$10 trillion. For first-lien mortgages, these loans can generally be delineated into (1) prime, (2) near-prime, (3) subprime, and (4) government guaranteed.² Table 1 summarizes the first-lien residential mortgage market by type of loan as of year-end 2007.

Prime Mortgages

Prime mortgages are made to borrowers with good credit histories, good repayment prospects, and above-minimum down payments. The prime market is the largest component of the residential mortgage market, accounting for about two-thirds of all lending. Over three quarters of these loans have a fixed interest rate.

Useful sources for the characteristics of prime mortgages are the \$4.1 trillion in loans securitized by Fannie Mae and Freddie Mac (Agency MBS). For Freddie Mac, as of year-end 2007, the average original loan-to-value (LTV) ratio was 71 percent and the average FICO score was 723. For Fannie Mae, these figures were similar -- 72 percent original LTV and 721 FICO.

Near-Prime (Alt-A) Mortgages

Near-prime loans, sometimes called Alt-A loans, are typically made to borrowers with good credit histories, but contain some other risk factors such as low documentation, a high loan-to-value ratio, a nontraditional amortization schedule, or a property that is not occupied by the owner. Servicers lump together prime and near-prime loans, so estimating their market shares is difficult; for this reason, Table 1 (and other statistics) combine prime and near-prime loans.³ Combined, prime and near-prime mortgages account for 78 percent of the number and value of residential mortgage loans.

Data from First American LoanPerformance include information on mortgages sold into private-label (i.e. non-Agency) mortgage-backed securities, including securities marketed as Alt-A, subprime, and jumbo. Among loans in Alt-A deals that originated in 2005 and 2006, the average FICO score was about 710, the average loan size was about \$303,000 and more than half were used for the purchase of a home. However, only 26 percent of the loans were fully documented, almost 39 percent were interest-only loans, and 23 percent allowed for negative amortization.⁴

Subprime Mortgages

A subprime mortgage is one made to a borrower with a poor credit history (e.g., a FICO score below 620) and/or with a high leverage as measured by either the debt-to-income ratio or the loan-to-value ratio). This market is estimated to encompass 6.7 million loans with a total value of about \$1.2 trillion. More than half of subprime mortgages (by number or value) have an adjustable

² The government guaranteed loans are those guaranteed by the Federal Housing Administration (FHA) and the Veteran's Administration (VA). These loans are not discussed in this document.

³ A rough estimate of the size of this market is 10 percent. See Note 1 in Table 1.

⁴ Loans can have either or both of the latter two features.

rate. Subprime adjustable-rate loans typically have an initial period of 2-3 years of fixed payments followed by variable payments thereafter (the so-called 2/28 and 3/27 mortgages). Starting around 2002, the subprime market grew dramatically, before declining in 2007.⁵

Table 2 provides some statistics for subprime mortgage characteristics using the First American LoanPerformance data, which include only subprime mortgage loans found in asset-backed securities. These loans are indeed made to risky borrowers: the average credit score is only 621 and over 90 percent of borrowers have FICO scores below 700. Two-thirds of the mortgages include full documentation of the information in the loan application. Prepayment penalties are observed for about 73 percent of the subprime mortgages and the average term of the prepayment penalty is 30 months.

Almost 20 percent of these subprime mortgages were “potentially prime”, that is, fully documented, property occupied by the owner, originated with an LTV below 80 percent, and a FICO scores of at least 620. This statistic is important because it represents an upper-bound on any estimate of the proportion of borrowers that may have been “steered” into more expensive loans than they had to take.

Finally, Table 1 does not account for home equity lending or second liens taken out after the origination of the first lien. These mortgages have a subordinate claim on the underlying property relative to the first lien. They can be for a fixed term (closed ended) or a line of credit (open ended). Junior liens totaled about \$1.1 trillion as of the first quarter in 2008.⁶

⁵ For estimates of the size of the subprime market see Mayer, Christopher J. and Karen Pence, NBER Working Paper, No. 14083, June 2008.

⁶ See line 22 in table L.218 of the Flow of Funds accounts.

Table 1
First Lien Residential Mortgage Loan Distribution by Number and Value
March 31, 2008

	Number of loans		Value of loans		Loans in Foreclosure (1000s)	Average Loan Size (\$1000s)
	Total (millions)	Percent of total	Total (\$trillions)	Percent of total		
All loans	54.7	100	10.1	100	1,352	200
Subprime loans	6.7	12	1.2	12	721	177
Fixed-rate	3.2	6	0.4	4	145	142
Adjustable-rate	3.2	6	0.7	7	543	218
Other	0.3	1	0.1	1	8	268
Prime & Near-prime	42.7	78	8.2	81	521	202
Fixed-rate	33.5	61	5.5	55	224	181
Adjustable-rate	7.7	14	2.5	24	266	331
Other	1.5	3	0.2	2	39	140
FHA/VA	5.3	10	0.7	7	111	140

Source: Calculations by Federal Reserve Board staff using Mortgage Bankers Association and First American LoanPerformance data.

Notes:

- 1) Reliable estimates of the size of the so-called “Alt-A” or near-prime sector are difficult to obtain, though they are probably concentrated in the adjustable-rate prime category. Outstanding “Alt-A” securities account for roughly 6 percent of mortgages; near-prime loans not securitized may account for up to an additional 4 percent of outstanding mortgages.
- 2) “Loans in foreclosure” refers to the inventory of loans in foreclosure. About half of loans that enter the foreclosure process proceed to final sale. Counts for subcategories (fixed-rate, adjustable-rate, other) do not add up to the category total because foreclosure counts are calculated from foreclosure rates for each subcategory and a separate foreclosure rate for that category.
- 3) Average loan sizes are adjusted by approximately 12 percent to match total value with the outstanding mortgage debt reported from Table Z.1 of the Flow of Funds accounts.
- 4) Subprime and Prime & Near-prime include loans not classified as either fixed or variable rate.

Table 2
Subprime Mortgage Characteristics
December 31, 2007

Characteristic	Total	Adjustable Rate	Fixed Rate
Number of Loans	3,542,728	2,274,513	1,268,215
Average Balance (\$)	181,347	199,621	148,573
Average Loan Age (Months)	26	22	33
Average FICO	621	617	628
FICO < 580 (%)	24.2	25.4	22.0
580 ≤ FICO < 620 (%)	25.6	26.9	23.3
620 ≤ FICO < 700 (%)	40.3	39.7	41.4
700 ≥ FICO (%)	9.9	8.0	13.3
% with Second Lien	22.3	29.9	8.7
% with LTV > 90 percent	35.9	43.3	22.6
% with Prepayment Penalty (PPP)	72.6	74.4	69.4
Average PPP Term (Months)	30	26	37
% Full Documentation	66.4	62.4	73.6
% Potentially Prime	19.9	12.1	33.9
Initial Interest Rate	7.99	8.03	7.92
Current Interest Rate	8.62	9.01	7.92
Margin (ARMs Only)	N/A	6.01	N/A
% Missing 1+ payments	47.1	54.6	33.6
Serious Delinquency Rate	17.4	22.5	8.3
% from California	14.1	15.8	11.1

Source: Federal Reserve Board staff calculations from First American LoanPerformance data.

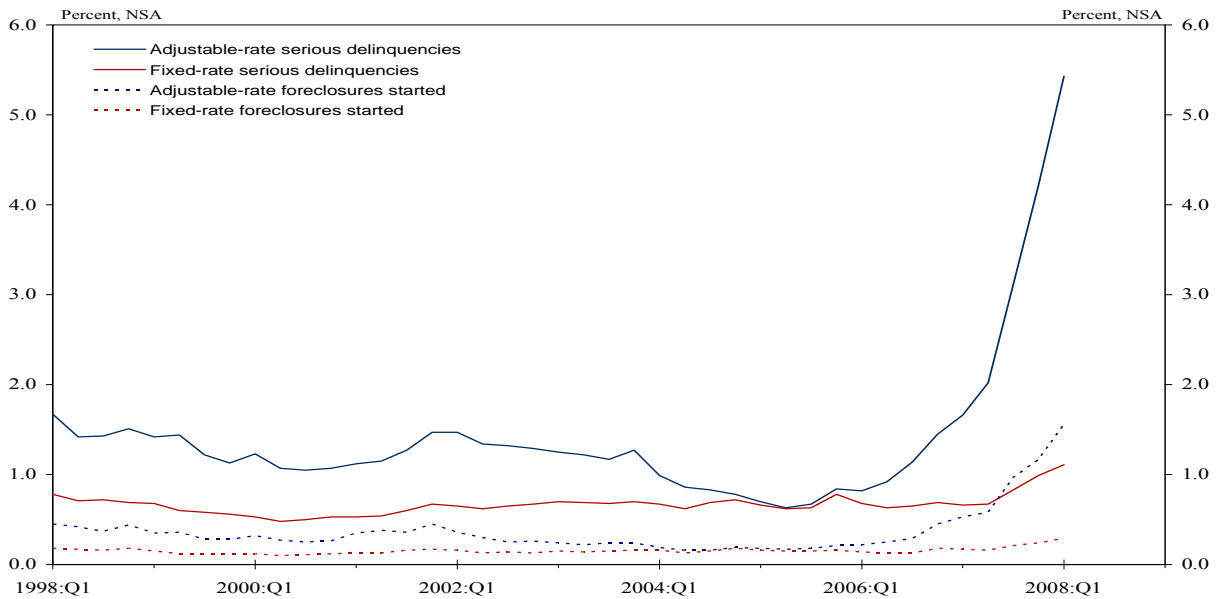
Notes: FICO scores, LTV values and 2nd lien percentages are at time of origination. Potentially prime are loans that at time of origination had less than 80 percent LTV, were fully documented, owner occupied, and had a FICO score of at least 620.

Section 2: Residential Mortgage Performance

By their nature, subprime loans perform worse than prime loans. Recently, however, they have performed particularly poorly. Figures 1 and 2 plot serious delinquency and foreclosure start rates for fixed-rate and adjustable-rate prime and subprime mortgages.⁷ (“Serious delinquencies” refer to those that are 90 days or more past due or in the foreclosure process.) As of the first quarter of 2008, the serious delinquency rate for fixed-rate prime mortgages was 1.11 percent and for adjustable-rate prime mortgages it was 5.43 percent. The rates were much higher for subprime mortgages. For fixed-rate subprime mortgages it was 8.73 percent and for adjustable-rate subprime mortgages it was 24.11 percent.

The proportion of mortgages that are seriously delinquent increased markedly over the past year, with performance of adjustable-rate mortgages deteriorating the fastest. As of the fourth quarter of 2006, prime mortgages had a serious delinquency rate of about 0.69 percent for fixed rate and 1.45 percent for adjustable rate. Similarly, subprime mortgages had a serious delinquency rate of 6.04 for fixed rate and 9.16 for adjustable rate. The pattern is similar for foreclosure starts.

Figure 1
Prime Mortgage Serious Delinquency & Foreclosure Start Rates
1998:Q1 to 2008:Q1

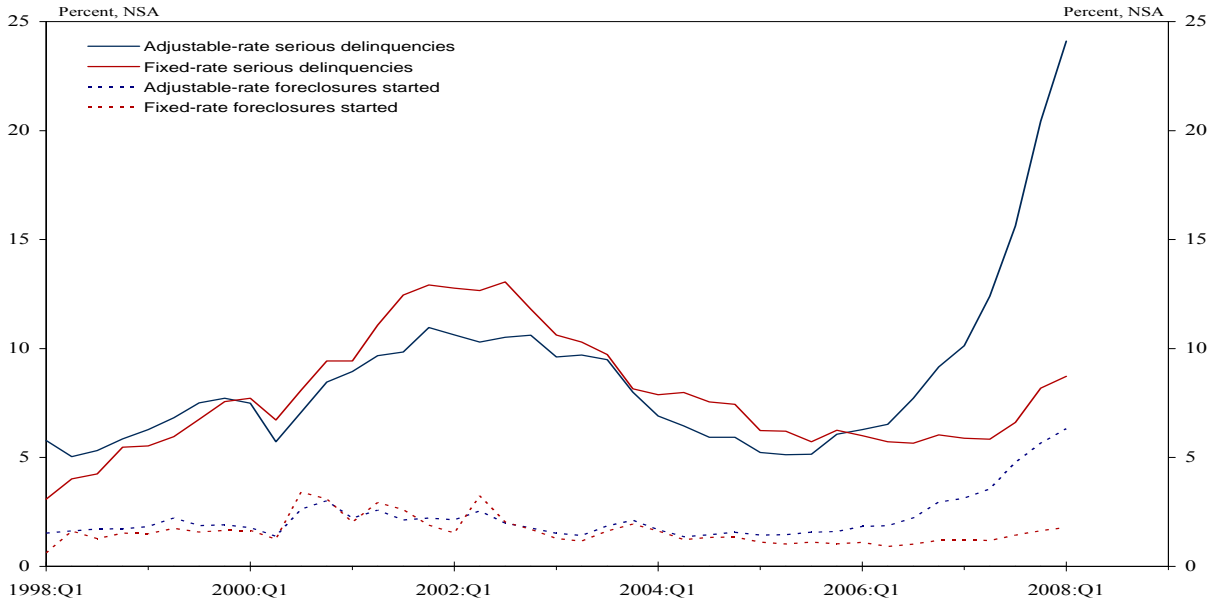


Source: Mortgage Banker’s association.

Notes: Foreclosures started is the percentage rate of loans for which a foreclosure was initiated. Serious delinquencies are loans 90+ days past due plus those in foreclosure.

⁷ These figures are taken from the National Delinquency Survey of the Mortgage Banker’s Association. This survey does not separately break out Alt-A loans.

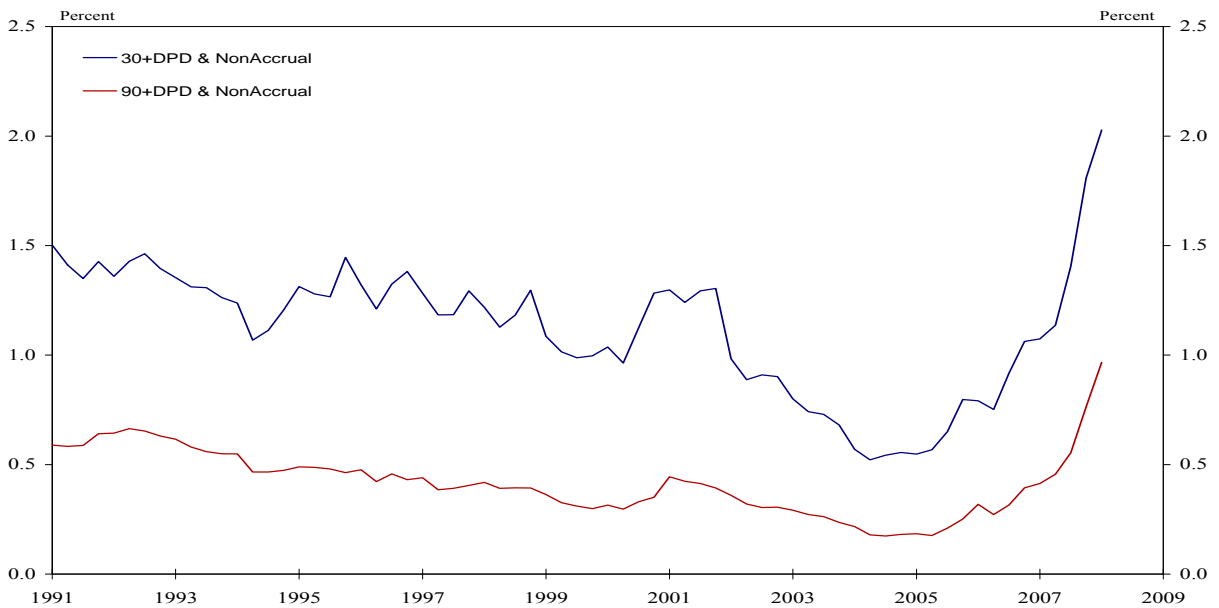
Figure 2
Subprime Mortgage Serious Delinquency & Foreclosure Start Rates
1998:Q1 to 2008:Q1



Source: Mortgage Banker's association.

Notes: Foreclosures started is the percentage rate of loans for which a foreclosure was initiated. Serious delinquencies are loans 90+ days past due plus those in foreclosure.

Figure 3: Past Due and Nonaccrual HELOCs at Commercial Banks



Source: Call report.

The performance of second-lien mortgages has also rapidly deteriorated. Figure 3 shows past due and non-accrual numbers for home equity lines of credit (HELOCs) held by commercial banks between 1991 and 2007. In just over two years, the percentage of these loans that reached 90-day delinquency or nonaccrual status increased from 0.25 percent at the end of 2005 to 0.76 percent at the end of 2007.⁸

For all of these mortgage types, credit quality has deteriorated over the last two years. The main factors are a combination of local and national factors. The local factors are house price declines and weak economic conditions. The national factor is a decline in underwriting standards.

House Prices and Economic Conditions

If house prices do not drop, there should be few foreclosures; if a borrower cannot afford the mortgage payment, he can always sell the house and pay off the mortgage (assuming that he has not borrowed more than the house is worth). Consistent with this logic, the most significant factor driving the recent deterioration in mortgage performance appears to be declining house prices. Table 3 reports correlations between subprime and Alt-A delinquencies and house price increases across MSAs. These correlations are highly negative. Of course, they may be correlated with other factors such as weak economic conditions, but even when controlling for these factors house prices seem to be most important.⁹

Table 3
Correlations between Subprime and Alt-A Mortgage Delinquencies and Foreclosures and the OFHEO House Price Index: 2005:Q3 to 2007:Q3 across MSAs

Correlations	HPI (2005:Q3 to 2007:Q3)
Subprime Delinquencies	-0.62
Subprime Foreclosures	-0.55
Alt-A Delinquencies	-0.59
Alt-A Foreclosures	-0.52

Source: Calculations by San Francisco Fed staff using First American LoanPerformance data for delinquencies and foreclosures and the OFHEO house purchase price index. Delinquencies are defined as 60+ days past due or in foreclosure.

Figure 4 reports annualized growth rates of the S&P/Case-Shiller national and 10-city home price indices and of the Office of Home Enterprise Oversight (OFHEO) home purchase index. The Case-Shiller indices use information on all house transactions, but have limited geographic coverage, especially of less-populated states and states that do not require public disclosure of real property transactions (so-called “non-disclosure” states). By contrast, the OFHEO index is based on transactions from all geographic locations, although, because OFHEO’s data come from mortgages purchased by Fannie Mae and Freddie Mac, OFHEO’s index is based only on properties financed with conforming mortgages (that is, mortgages that can be guaranteed by

⁸ For 2002-2007, the performance of closed-end second liens is similar though at a higher rate than HELOCs.

⁹ See Doms, Mark, Fred Furlong, and John Krainer, “Subprime Mortgage Delinquency Rates.” Federal Reserve Bank of San Francisco, Working Paper 2007-33, November 2007.

Fannie and Freddie). As a result, the OFHEO index misses properties financed with jumbo or other nonprime loans.

All three indices show high growth rates through 2006. The S&P/Case-Shiller indices start dropping by the end of 2006, while the OFHEO index peaked only in 2007:Q2. This is likely due to the different composition of their samples. In particular, the S&P/Case-Shiller indices are heavily weighted towards areas that first experienced above-average appreciation and are now seeing similar depreciation.

Figure 5 shows the expected price path according to the Case-Shiller futures market. This market expects a nearly 10 percent drop through early 2008, before starting to recover. Again, the Case-Shiller index is heavily weighted towards the most volatile housing markets and for this reason will overstate the house price effects in many other parts of the country.

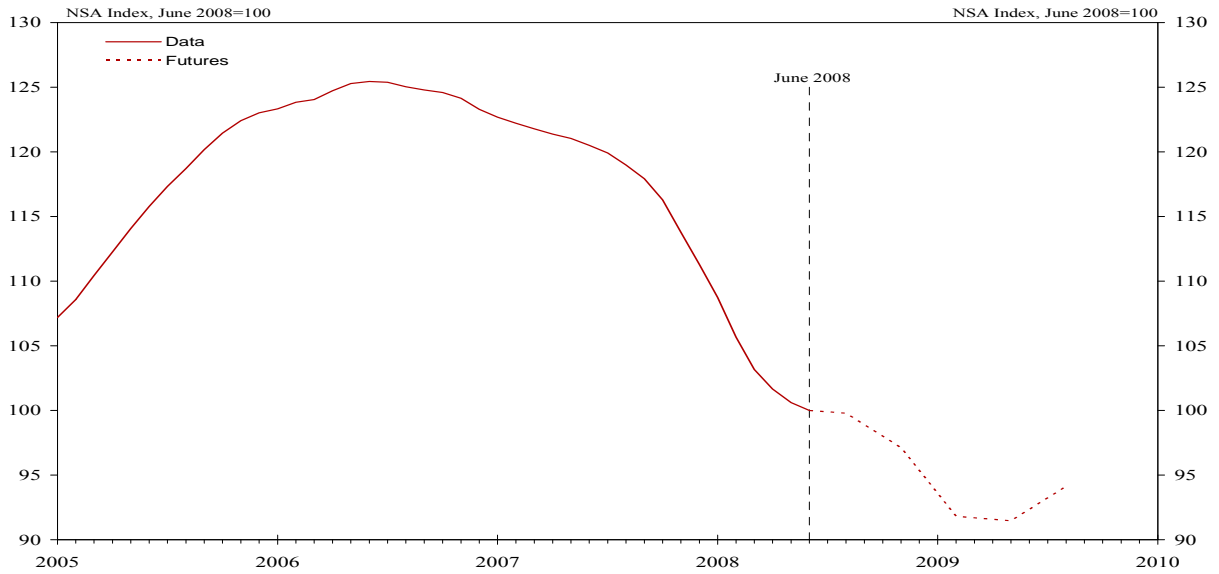
S&P/Case-Shiller also calculate a price index for three “tiers,” or price segments, of each market that it covers. Figure 6 shows these indices for Washington, D.C. Note that house price appreciation varies across market segments. The lowest tier of the housing stock grew the most in price and is now dropping the most. In contrast the highest tier grew the least and now has dropped the least. This pattern is observed in most of the MSAs covered by S&P/Case-Shiller. These numbers are highly relevant for the subprime market because subprime mortgages are more likely to be in the lowest tier.

Figure 4
OFHEO and S&P/Case-Shiller House Price Indices: 1992-2008



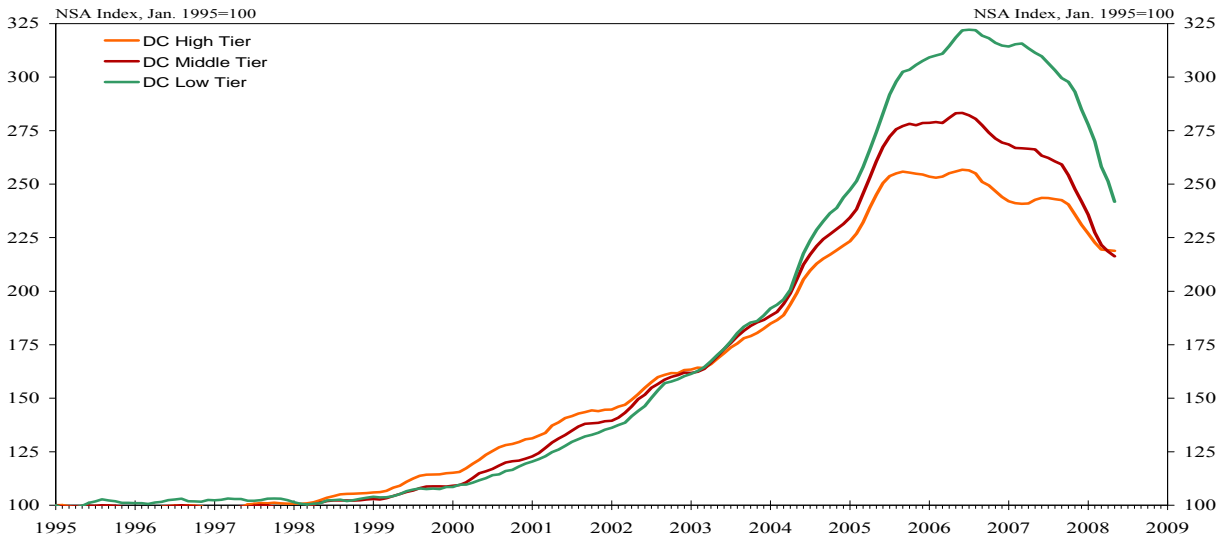
Source: S&P Case-Shiller and OFHEO/Haver Analytics.

**Figure 5: S&P/Case-Shiller Composite 10-City House Price Futures
(Calculated August 27, 2008)**



Source: S&P/Case-Shiller and Haver Analytics.

**Figure 6: S&P/Case-Shiller Tiered Home Price Index
Washington, D.C. 1995-2008**

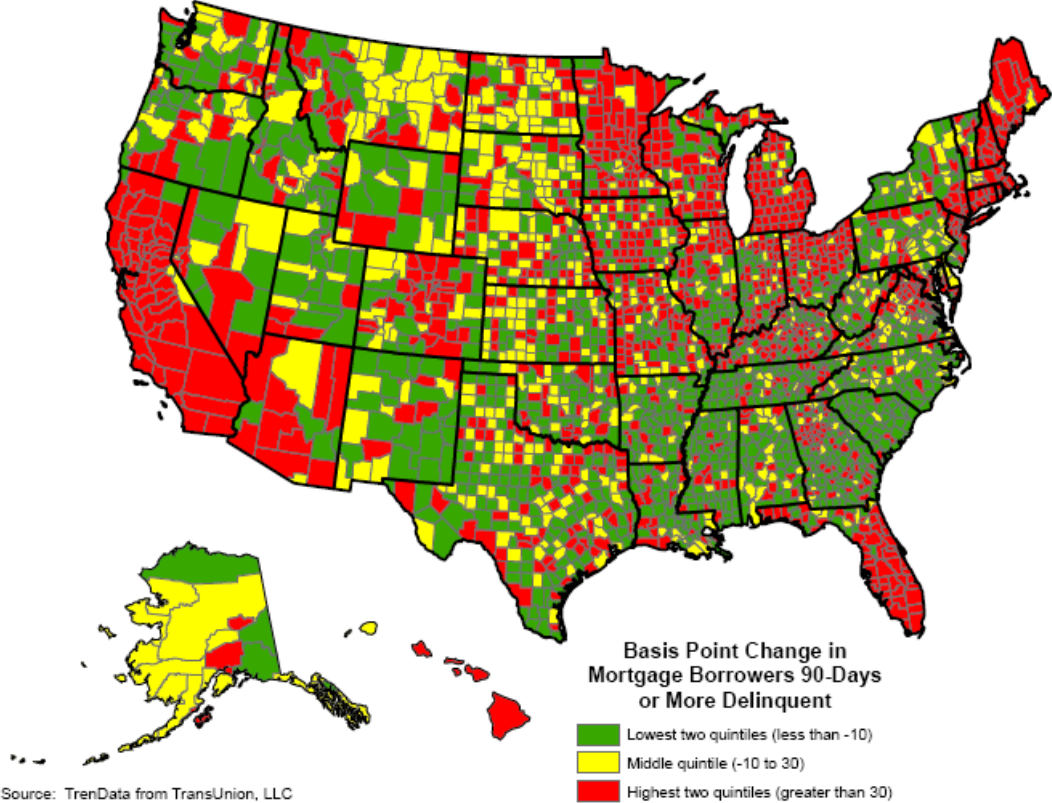


Source: S&P/Case-Shiller/Haver Analytics.

Notes: Prices for all three tiers are indexed to 100 in January 1995.

There are significant regional differences in the performance of housing markets. Some of the worst performing markets are those that had most recently seen the highest rates of house price appreciation – e.g., California, Florida, and Nevada. Although house-price changes are driving much of the increase in delinquencies in many parts of the country, in some regions, they are more tied to local economic conditions. For example, elevated rates of unemployment in certain areas, such as midwestern states struggling with job losses in the manufacturing sector, have contributed to elevated rates of delinquency in those areas. Figure 7 is a map of the changes in mortgage delinquency rates (90 days or more past due) from the 4th quarter of 2004 to the 4th quarter of 2007 for each county in the United States.

Figure 7
Change in Mortgage Delinquency by County
(4th quarter 2004 to 4th quarter 2007)



Notes: Calculations by Federal Reserve Board Staff.

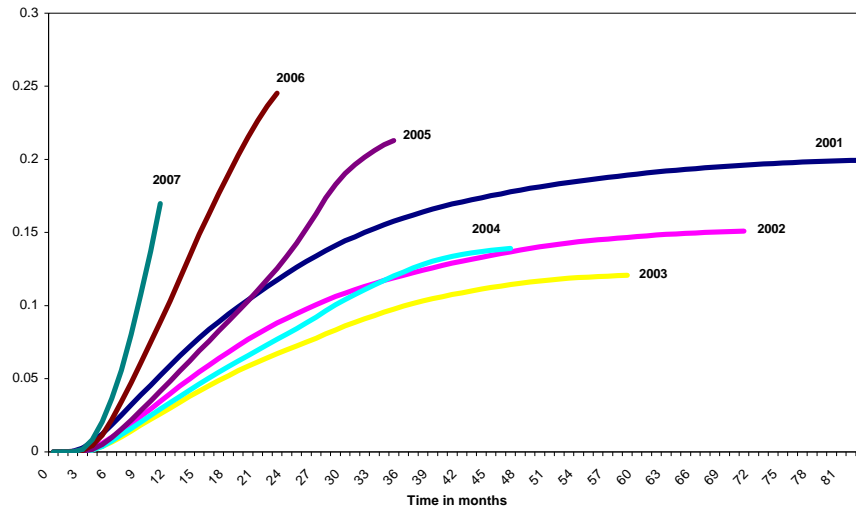
Section 3: Characteristics of Subprime Mortgages

The extremely poor performance of subprime ARMs has led some observers to argue that these are poorly designed contracts that hurt borrowers. A special case of this argument implicates the use of introductory “teaser rates” and the resetting of interest rates for subprime ARM borrowers. However, there is strong evidence that adjustable-rate subprime mortgages attracted riskier borrowers than fixed-rate subprime mortgages and that the reset dates alone do not drive delinquencies.

Table 2 presents evidence that riskier borrowers choose ARMs. Fixed-rate subprime mortgages have higher FICO scores, a higher fraction that are fully documented, and lower loan-to-value ratios. Table 2 also lists an average starting initial interest rate of around 8.0 percent. This is a higher starting rate than prime loans have and hence is not much of a “tease.”

The effect of a reset depends on whether the borrower can prepay the loan by either selling the house or refinancing and if they cannot prepay, what happens to the reference index rate. Figure 8 shows cumulative default rates by origination year, or vintage, for 2/28 loans. The 2001-2004 vintages have no spike at the reset date of 24 months. As we will discuss later, of the loans that do not default, most of them are prepaying, particularly near the reset date. The 2005 vintage is the only one that experienced a jump in defaults after the reset date. (The 2007 vintage and most of the 2006 vintage have not reached their reset dates.) Some of these loans reset when the index rates were high, but the 2004 vintage also reset when the index rate was high in 2006. Instead, the key difference is that in 2007, house prices had dropped and credit markets had tightened, so a highly leveraged borrower could not prepay his loan through selling or refinancing. It is for this group of borrowers that a reset was a problem.

Figure 8
Cumulative Default rates on Subprime 2/28 ARMs by Origination Year: 2001-2007

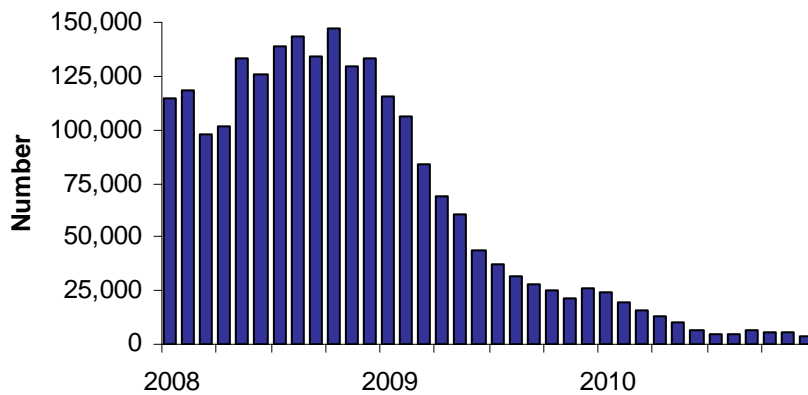


Source: Federal Reserve Board staff calculations from First American LoanPerformance data (as of January 2008). A default is a mortgage entering the foreclosure process.

Many of the 2006 vintage loans have not reached their reset, but at present index rates they will not reset much higher. Monetary policy actions during 2008 have muted the effect of a reset on payment levels. The average margin on these mortgages after their reset is 6.0 percent, which means that the adjustable rate will reset to 600 basis points above the index to which the rate is tied (e.g., the 6-month LIBOR). Today, this would translate to an average post-reset ARM rate of about 9.15 percent, which is not much more than the average initial rate of 8.0 percent. (Note that most subprime ARM contracts have a floor on the interest rate equal to the initial rate.)

Figure 9 shows the number of first interest rate resets for *all* types of subprime ARMs. These resets are concentrated in 2008 and 2009 because of the dearth of new subprime mortgage originations.

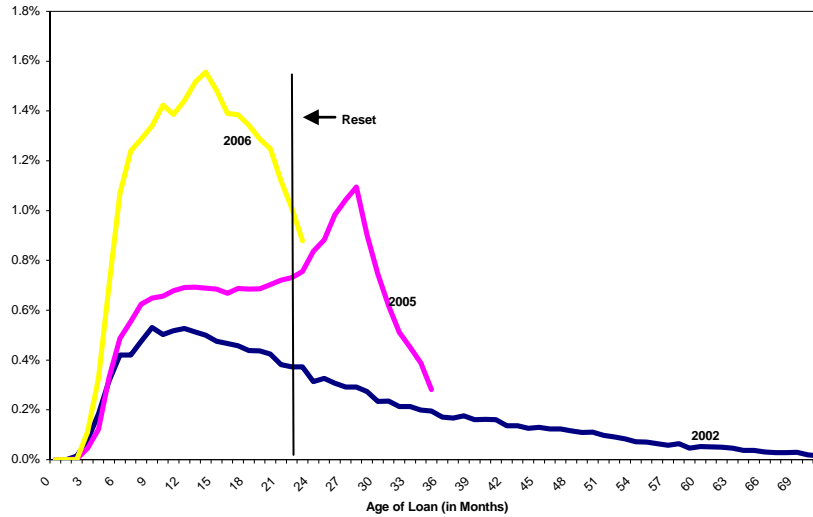
Figure 9
Number of Subprime ARM Resets
(as of 4th quarter 2007)



Source: Federal Reserve Board calculations from First American LoanPerformance data.

More interesting than the resets, however, are other characteristics of these loans. In particular, these loans are very risky and they typically do not last long. Figure 10 shows the fraction of loans originated in a particular year that become delinquent, that is, go into foreclosure by the age of the loan for three different vintages of 2/28 ARMs. For the 2002 and 2006 vintages, there is a spike in default around 6 months that stays high until 12 to 15 months and then declines. The 2005 vintage also exhibits a large increase in defaults around 12 months, but then the frequency of defaults stays elevated. At the reset date the frequency increases, for the reasons previously discussed, but then rapidly declines.

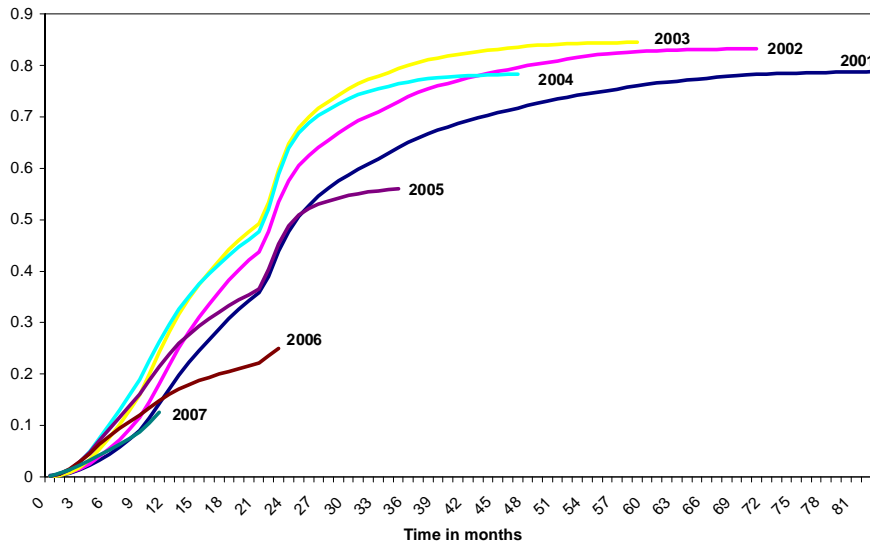
Figure 10
Non-Cumulative Default Rates by Age for Several Vintages of Subprime 2/28 ARMs



Source: Federal Reserve Board Staff using First American LoanPerformance data (as of January 2008).

Not only do many of these loans go into default relatively quickly, but except for the last two vintages, even more prepay relatively soon. Figure 11 shows cumulative prepayment rates for the 2001-2007 vintages. A similar picture arises insofar as a majority of these loans are prepaid by 30 months, though the 2006 and 2007 vintages have less prepays because of the decline in house prices and the tightening of credit conditions. Note that there is a discernible increase in prepayments right after the reset date (24 months) – consistent with both the reset itself as well as the expiration of prepayment penalties.

Figure 11
Cumulative Prepayment Rates for Subprime 2/28 ARMs: 2001-2007 Vintages



Source: Federal Reserve Board staff calculations from First American LoanPerformance data (as of January 2008).

The large numbers of defaults and prepayments emphasizes just how short the effective maturity of these loans was. In practice, the 2/28s seem to have really been a short-term mortgage with a balloon payment. Table 4 provides statistics on the number of 2/28 ARM originations that are inactive, either because of prepayment or default, for the 2001 to 2006 vintages. The first row shows the proportion of loans that are still active as of March 2008. For the 2001-2004 vintages, most subprime mortgages terminated via prepayment or default within 36 months. Do note, however, the significant decline in terminations for the 2006 vintage despite high default rates. This likely reflects the inability to prepay because of the decline in house prices and the connected tightening of credit standards.

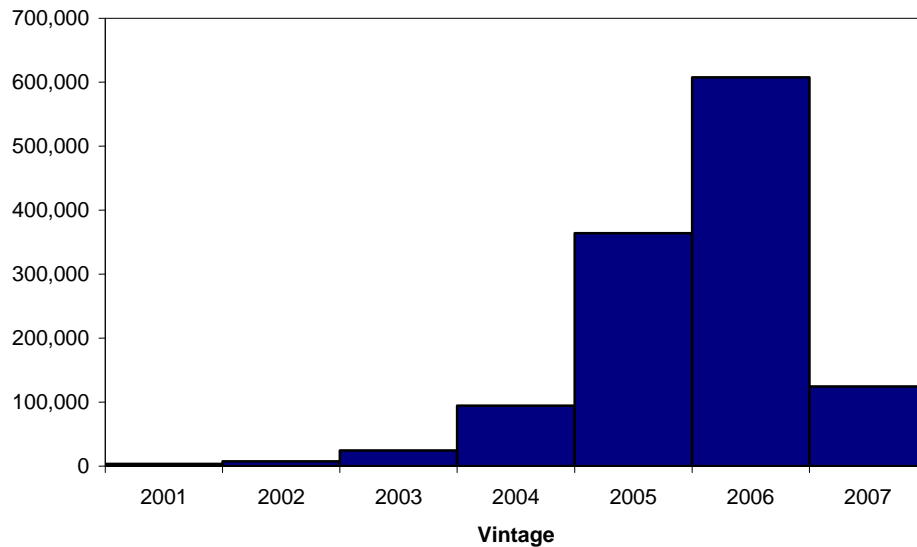
**Table 4: Cumulative Prepayment plus Default Rates
For 2/28 Subprime Mortgages: 2001-2006
(as of March 2008)**

	2001	2002	2003	2004	2005	2006
Still active	1.2	1.6	3.4	7.6	22.2	48.1
6 months or less	6.3	6.5	8.3	10.9	10.4	10.2
7 to 12 months	22.9	25.7	31.2	33.0	28.7	26.4
13 to 18 months	40.1	45.1	49.3	49.0	42.2	39.5
19 to 24 months	59.9	66.8	71.7	71.9	62.2	51.0
25 to 30 months	73.2	79.0	84.0	83.9	73.7	
31 to 36 months	81.1	86.0	90.0	89.1	77.6	

Source: Federal Reserve Board Staff calculations using First American LoanPerformance data.

Finally, the high prepayment and default rates have led to the stock of existing 2/28 subprime ARM loans to be heavily composed of recent loans. Figure 12 reports the composition of active 2/28 ARMs by vintage. Most of the active loans are from the 2005 and 2006 vintages. The earlier vintages are no longer active and the change in credit conditions in 2007 limited the size of that vintage.

Figure 12
Number of Active 2/28 Subprime Mortgages by Vintage as of January 2008

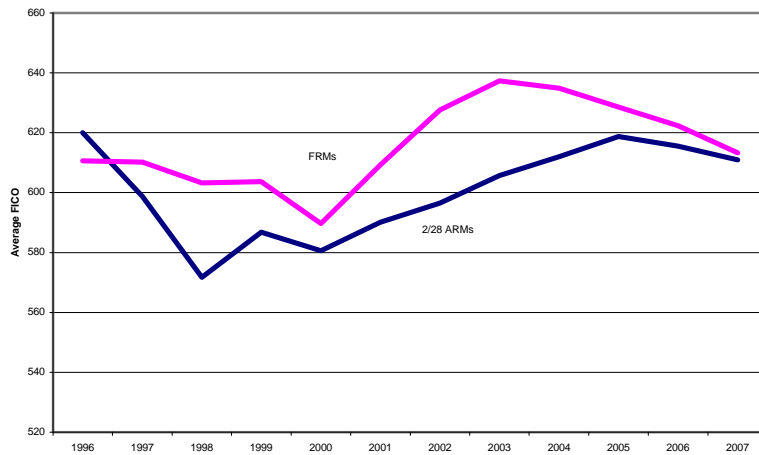
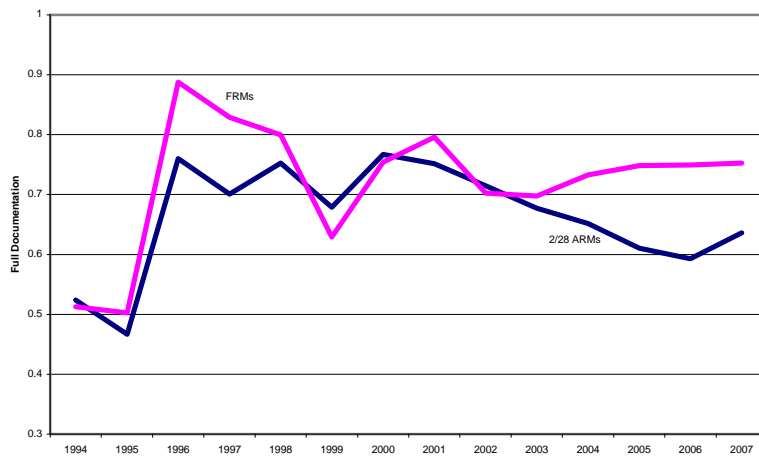
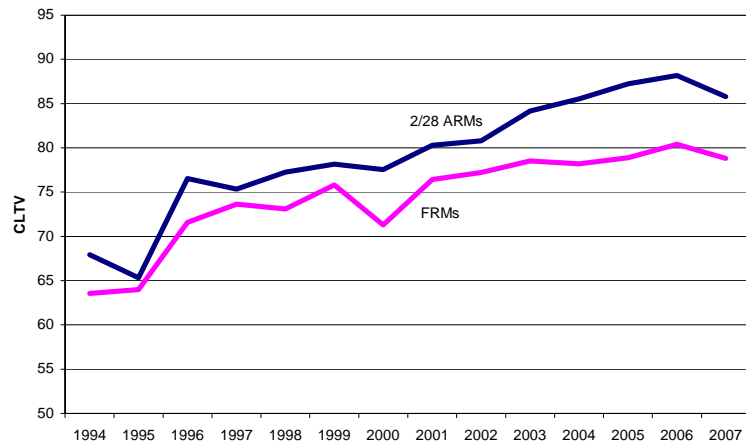


Changes in Underwriting Standards over Time

One of the most striking feature of the vintage curves is the increased deterioration of the most recent vintages. As we discussed, the decline in housing prices was a factor. However, another important factor was the decline in underwriting standards over the last ten years.¹⁰ Figure 13 reports the changes in subprime mortgage underwriting standards in recent years for 2/28 ARMs and fixed-rate loans. First, (combined) loan-to-value ratios increased this decade for subprime mortgages and are significantly higher for 2/28 ARMs. Second, the percentage of subprime loans that were fully documented declined for 2/28 ARMs and stayed roughly constant for fixed-rate loans. Finally, FICO scores for fixed-rate products declined since 2003. Somewhat surprisingly, FICO scores for 2/28 ARMs increased until 2005 before declining.

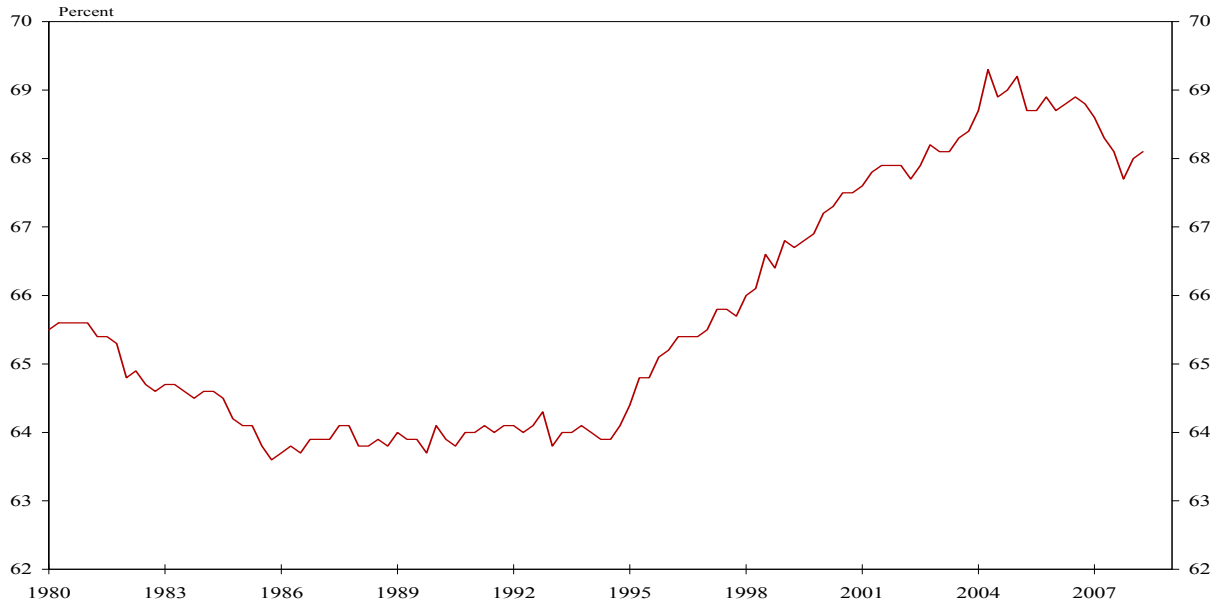
¹⁰ Also see Demyanyk, Yuliya and Otto van Hemert, “Understanding the Subprime Mortgage Crisis.” (February 29, 2008) Available at SSRN: <http://ssrn.com/abstract=1020396>.

Figure 13: Changes in Underwriting Standards for Subprime Mortgages: 1994-2007
Fixed Rate versus 2/28 ARMs; Risk Factors: CLTV, Full Documentation, and FICO Score



Source: Federal Reserve Board staff calculations using First American LoanPerformance data.

Figure 14: U.S. Homeownership Rate (SA): 1980-2008:Q2



Source: Census Bureau and Haver Analytics.

Section 4: Homeownership & Household Mortgage Choice

This section reports information on household tenure decisions. It lists information on homeownership rates and household equity. Finally, it reports some suggestive evidence that the developments in the mortgage market had an impact on the length of homeownership tenure for some households.

One of the most significant changes in housing markets over the last decade has been the change in the homeownership rate. Figure 14 reports the time path for the U.S. homeownership rate, seasonally adjusted. This rate increased dramatically from 1995 to 2005, rising from roughly 64 percent of U.S. households to almost 70 percent. Since the peak in 2004 it has quickly dropped. As of the end of the second quarter 2008, homeownership stood at about 68.1 percent.

The increase in homeownership is potentially attributable to many factors. There were changes in the availability of mortgage products, such as low down payment loans and subprime loans. There were also demographic changes and low interest rates that would affect demand. Finally, changes to the Community Reinvestment Act during the mid-1990s and the introduction and tightening of federal housing goals for Fannie Mae and Freddie Mac may have also played a role.

Chambers, Garriga, and Schlagenhaut (2007) disentangle some of these effects.¹¹ They estimate that demographic changes only account for 16 to 31 percent of the increase in home ownership rates, while the rest is accounted for by the introduction of new mortgage products, in particular, those with lower down payment requirements. The authors also report that there were disproportionate changes in the homeownership rate by age group – with younger homeowners rising the most in percentage terms (Table 5). There are also increases across the board for income groups, where income groups are defined relative to what fraction of national income they have (e.g., the first income group is the set of people who earn the first twenty percent of national earnings).¹² The biggest increases are in the second and third income groups (Table 6).

Table 5
Homeownership Rate by Age Cohort: 2005 versus 1994

Household Age	1994	2005	Difference
Less than 35 years	37.3	43.0	5.7
35 to 49 years	64.6	68.7	4.1
50 to 64 years	77.6	79.4	1.8
65 to 74 years	80.3	82.7	2.4
75 year and over	73.5	78.4	4.9
Total	64.0	69.0	5.0

Source: Chambers, Garriga, and Schlagenhaut (2007) using data from the CPS/VHS (Housing Vacancies and Homeownership) and AHS (American Home Survey) surveys.

Table 6
Homeownership by Income Groups: 2003 versus 1994

Household Income Group	1994	2003	Difference
Group 1	46.63	52.83	6.20
Group 2	56.05	67.01	10.96
Group 3	64.40	77.93	13.53
Group 4	75.54	88.78	13.24
Group 5	89.13	96.57	7.44

Source: Chambers, Garriga, and Schlagenhaut (2007) who use CPS/VHS and AHS surveys.

The developments in the mortgage market over the last twenty years had a significant effect on the length of homeownership tenure and the LTV at purchase for some borrowers. Massachusetts experienced an earlier wave of foreclosures during the early 1990s because of a decline in regional economic conditions at the time. Foote, Gerardi, Goette, and Willen (2008) report a significant change in the characteristics of foreclosed upon homes between today and the earlier

¹¹ Chambers, Mathew, Carlos Garriga, and Don E. Schlagenhaut. “Accounting for Changes in the Homeownership Rate.” Federal Reserve Bank of Atlanta Working Paper, 2007-21, September 2007.

¹² This means that there are not equal numbers of people in each group. Furthermore for the U.S. income distribution, most of the population is in the lower groups.

period.¹³ Table 7 shows how long a foreclosed upon household had lived in the house before it was foreclosed upon. In 1992, only 15.3 percent of foreclosures were on households who had lived in their house for less than three years. In 2007, this number was 45.1 percent.

Table 7
Distribution of Ownership-Experience Lengths among Foreclosures

	< 1 year	< 2 years	< 3 years	> 3 years	≥ 5 years	≥ 10 years
2006	4.0	26.9	42.4	57.5	42.3	21.8
2007	3.1	25.8	45.1	54.9	38.8	21.1
1991	5.8	11.7	24.8	75.1	.	.
1992	3.2	6.6	15.3	84.6	.	.

Source: Foote, Gerardi, Goette, and Willen (2008).

They also report substantial changes in LTV ratios at purchase for homes that were ultimately foreclosed upon in Massachusetts (Table 8). Notably, in 2006 and 2007, about half of the homes had LTVs exceeding 95 percent -- and fewer than 10 percent of homes had mortgages with LTVs below 80 percent. These numbers are dramatically different than in 1991 and 1992.

Table 8
Loan-to-Value Ratios at Purchase for Foreclosed Homes in Massachusetts

	≤ 80%	80%-95%	95%-100%	≥ 100%
2006	8.6	41.1	15.7	34.5
2007	8.0	38.4	13.4	40.0
1991	35.9	53.9	1.9	8.2
1992	30.4	58.0	2.7	8.8

Source: Foote, Gerardi, Goette, and Willen (2008).

Gerardi, Shapiro, and Willen (2007) also make the interesting observation that the subprime market should not be analyzed in isolation from the prime market. They report that many subprime loans were refinanced from prime loans.¹⁴ Using the same Massachusetts data, they find that 44 percent of mortgage foreclosures were on homeowners whose last mortgage was originated by a subprime lender. Of these, 60 percent initially financed the purchase of their house with a prime loan. The authors do not know why these households tapped their home equity, but a material change in their economic condition, such as job loss, divorce, or a major expense, is an important possibility. In this case, the subprime loan is not necessarily the cause of the problem, but a symptom of it. The short duration of the subprime loans, as reported earlier in

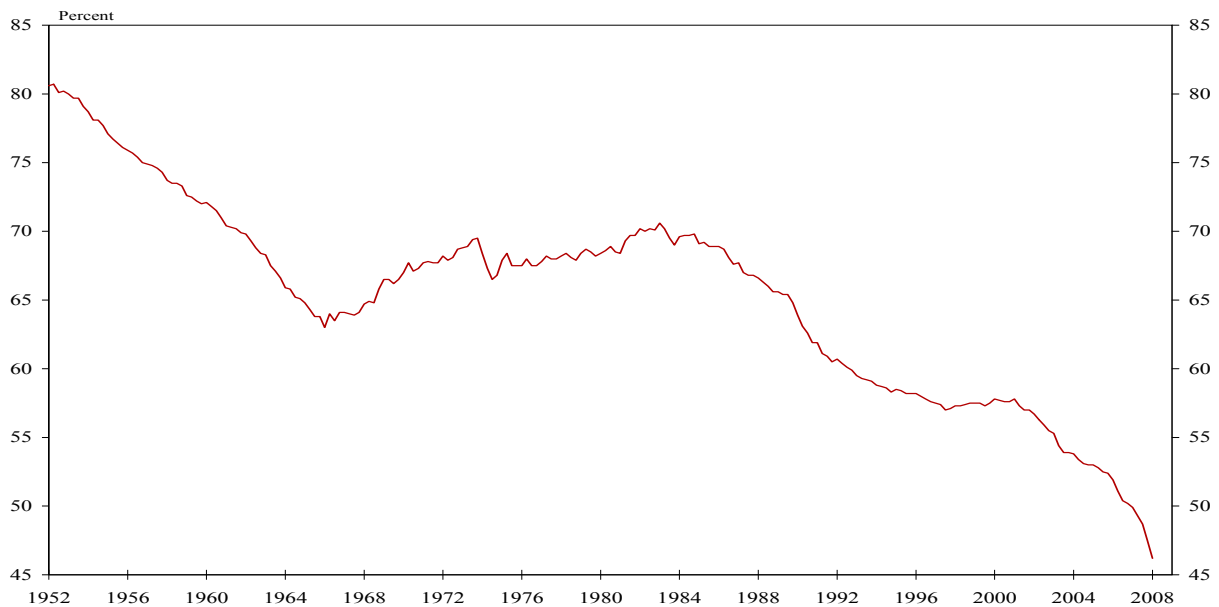
¹³ Foote, Christopher L., Kristopher Gerardi, Lorenz Goette, and Paul S. Willen, "Subprime Facts: What (We Think) We Know about the Subprime Crisis and What We Don't." Federal Reserve Bank of Boston Public Policy Discussion Papers, No. 08-2, May 2008.

¹⁴ For more details see Gerardi, Kristopher, Adam Hale Shapiro, and Paul S. Willen, "Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures," Federal Reserve Bank of Boston Working Paper 07-15, December 2007.

Table 4, also suggests that households may have been repeatedly refinancing, possibly to tap equity that had built up due to the increase in housing prices. Why they tapped that equity, whether in response to a financial shock as discussed above, or to consume some of their wealth, we do not know. Household level panel data is needed to answer this question.

Finally, the increase in leverage associated with subprime borrowers and foreclosed-upon borrowers is not just specific to these segments of the mortgage market. It is an economy-wide phenomenon. Over the past 20 years, households have become increasingly leveraged with respect to their homes. Figure 15 shows the proportion of owner's equity as a percentage of household real estate since 1952. The decline starting the mid-1980s is consistent with the expansion of home equity lending products at that time following the Tax Reform Act of 1986 (e.g., Manchester and Poterba 1989).¹⁵ More recently, however, other factors may also have been at work, but a full analysis of this is beyond the scope of this document.

Figure 15
Owner's Equity as a Proportion of Household Real Estate



Source: Flow of Funds and Haver Analytics.

¹⁵ Manchester, Joyce M. and James M. Poterba, 1989. "Second Mortgages and Household Saving," Regional Science and Urban Economics, 19(2), 325-346.