

CRS Report for Congress

Alternative Mortgages: Causes and Policy Implications of Troubled Mortgage Resets in the Subprime and Alt-A Markets

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Summary

Borrowers who used alternative mortgages to finance homes during the housing boom have experienced rising foreclosure rates as housing markets have declined. Some types of alternative mortgages may have exacerbated price declines and damaged the finances of consumers and lenders. The use of mortgages with adjustable rates, zero down payment, interest-only, or negative amortization features raise economic risk compared to traditional mortgages. Because some borrowers and lenders did not adequately evaluate these risks, housing finance markets have been hit with significant losses and financial markets have been in turmoil. Policymakers have responded with a housing rescue package (H.R. 3221 / P.L. 110-289). They have also authorized the Department of Treasury to institute a Troubled Asset Relief Program (TARP) to buy bad debts from banks (H.R. 1424 / P.L. 110-343).

Alternative mortgages offer some combination of adjustable rates, extremely low down payments, negative amortization, and optional monthly payments. The prudent use of alternative mortgages offers benefits. For example, during periods of exceptionally high interest rates, adjustable rates may suit consumers expecting rates to fall. People whose incomes depend on commission or bonuses may be attracted to mortgages with flexible monthly payments.

These benefits come with potential costs for the borrower and for the financial system. Adjustable rates shift the risk of rising interest rates from banks to borrowers. Low down payments increase the risk that borrowers will owe more than their house is worth if prices fall. A borrower owing more than the house is worth may be unable to sell or refinance the house. The use of alternative mortgages in these areas may have contributed to rising defaults and more volatile home prices. More than a trillion dollars of mortgages originated during the boom will reset their monthly payments by 2009.

Using its authority under the Truth in Lending Act (TILA) and Regulation Z, the Federal Reserve issued on July 14, 2008, new rules for mortgage origination. These rules apply to banks and to non-bank lenders. These rules would put some restrictions on the use of prepayment penalties for mortgages with introductory periods and requires disclosures for mortgages with adjustable rates. The House of Representatives passed a bill to provide additional rules for underwriting practices of alternative mortgages (H.R. 3221) but a similar bill has not as yet passed the Senate.

This report describes alternative mortgages, summarizes recent regulatory actions, and provides an estimate of the geographic concentration of interest rate risk and negative appreciation risk. It will be updated if market developments warrant.

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Alternative Mortgages: Causes and Policy Implications of Troubled Mortgage Resets in the Subprime and Alt-A Markets

Background

More than a trillion dollars of mortgages will have payment resets in 2007-2009.¹ A newspaper account of one resident of Garden Grove, California, illustrates the problem. His monthly mortgage payment doubled and he learned that he owes more than his house is worth because prices of neighboring houses fell by \$140,000.² It will be a struggle to maintain the higher payments on his resetting mortgage and it is difficult to refinance while he is upside down.³ The Federal Reserve issued new rules pursuant to the Truth in Lending Act (TILA) to help potential home buyers understand the risks in alternative mortgages and to ensure that lenders follow safe and sound practices. Unlike a regulatory guidance, Regulation Z applies to banks and to non-bank lenders that operate in the subprime and Alt-A mortgage sectors.⁴ Mortgage delinquencies and foreclosures are rising and the prospect of coming mortgage resets in declining housing markets suggests that defaults will rise even higher.

Alternative mortgages are sometimes called nontraditional mortgages or exotic mortgages. Alternative mortgages have some combination of variable interest rates, extremely low down payments, interest-only periods, and/or negative amortization. (Amortization refers to the gradual payment of the loan's principal.) In some cases, borrowers intended to refinance these loans or sell the houses relatively quickly. The potential advantages of alternative features for these buyers often depended on the expected path of interest rates and home appreciation. Significant disadvantages became apparent, however, when interest rates and appreciation took what to some was an unexpected turn. The sudden decrease in house price appreciation during 2006-2008 has caused problems for borrowers using alternative mortgages with resets that are expected to occur in coming months.

¹ "Facing the Fallout from Foreclosures," *Community Banker*, November 2006. p. 40.

² "Falling Prices Trap New Home Buyers," *Orange County Register*, December 13, 2006.

³ When a borrower owes more than the collateral is worth, the borrower is said to be upside down.

⁴ Subprime borrowers typically have significantly lower credit scores or other indicators of high risk while Alt-A borrowers have better credit but may have some other defect, such as reduced income documentation.

House prices boomed from 2000 to 2005 in many parts of the country and then suddenly ground to a halt in 2006. Since 2006, house prices have fallen in many markets. Although adjustable rate mortgages are not new, their increased use during the boom was counterintuitive to many economists because mortgage rates were already low by historic standards. Other alternative features were not new but their use by the general public increased during the boom. The increased use of alternative mortgages by unsophisticated borrowers may have been a significant contributor to the rise in mortgage delinquencies and foreclosures.

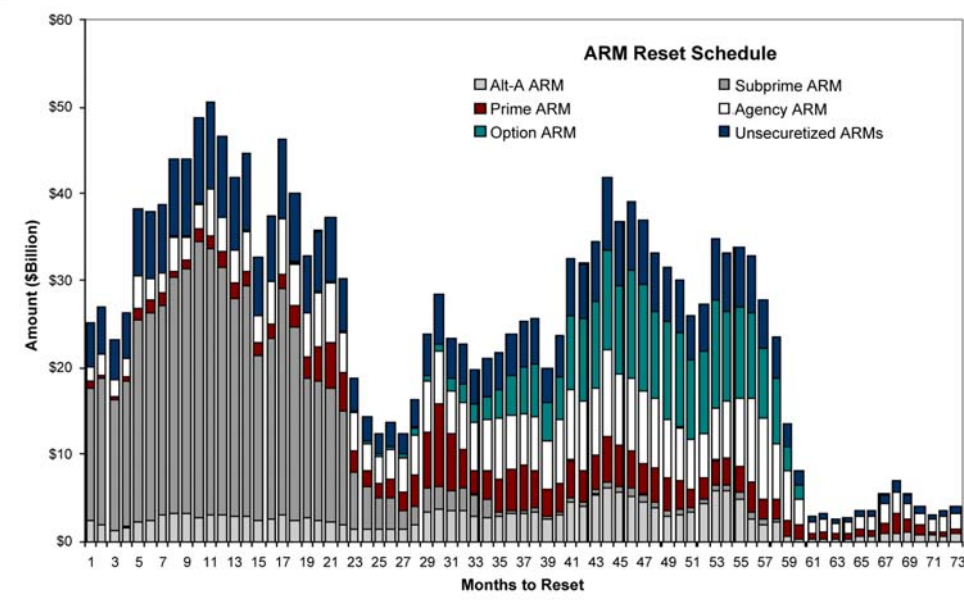
This report recounts recent events that led to increased foreclosures and the forecast of higher foreclosures, explains salient features of alternative mortgages, summarizes federal agency response, places the potential benefits and risks to consumers and financial systems in the context of economic conditions, and assesses the estimates geographic impact.

Events That Led to Unsustainable Mortgages

Size and Timing of the Upcoming Mortgage Resets

Mortgage defaults are rising and are expected to increase significantly. Housing prices have slowed or declined in previously booming areas, and it is taking longer to sell homes; troubled borrowers now find it more difficult to sell their property to avoid foreclosure. Many borrowers took out loans with introductory periods that will expire resulting in higher payments even if interest rates are low, and the underwriting of these loans appears to be relatively weak. The combination of mortgage payment resets and weaker housing markets could lead to even higher mortgage defaults in coming years.

There are two periods of higher scheduled resets. **Figure 1** shows that the first period (January 2007 - September 2008) had a high proportion of subprime loans. Month 1 in **Figure 1** represents January of 2007; therefore, month 23 represents November 2008, which has a low number of subprime resets. After November 2008, the number of payment resets in the Alt-A and option ARM categories increases. Alt-A loans are typically loans that would be considered low risk if everything in the loan documentation turns out to be accurate; that is, the loan has an alternative way to meet “A” standards, such as reduced income documentation. Informally, these loans are sometimes referred to as “liar loans” because of the potential for fraud. An option ARM is a loan that allows the borrower several options for any given month’s payment, including paying less than the current interest due. If the borrower pays less than current interest due then the loan negatively amortizes — the balance increases and future payments rise.

Figure 1. Alternative Mortgage Resets**Adjustable Rate Mortgage Reset Schedule**

Note: Date as of January 2007.

Source: Credit Suisse Fixed Income U.S. Mortgage Strategy.

Resets Are the Result of Decisions Made in 2004-2007

Subprime borrowers often used alternative mortgages with two- or three-year introductory periods, so-called 2-28s and 3-27s. A 2-28 originated in the second half of 2005 resets in the second half of 2007. The 2-28 and 3-27 resets that occurred through summer 2008, therefore, were originated in 2004 through 2006. The state of the housing market and financial markets during 2004 through 2006 may provide clues to the sustainability of these mortgages.

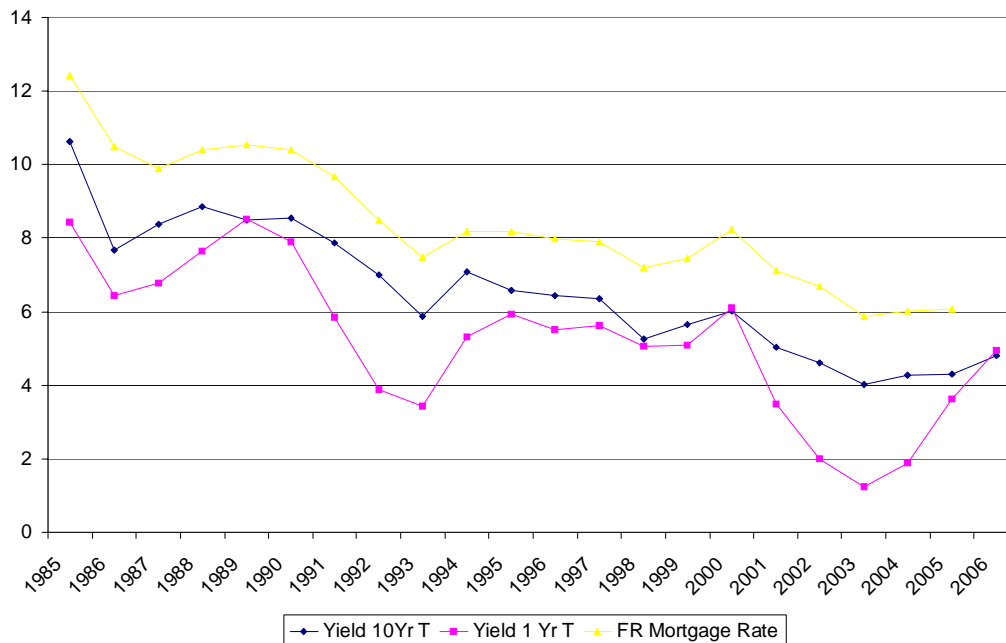
The housing market in many areas appreciated sharply in 2004 and 2005, but then the rate of appreciation slowed in 2006 and has ultimately begun to fall. Rapidly rising house prices build an owner's equity, which improves the borrower's risk-profile and allows refinancing on better terms. Some borrowers and lenders may have agreed to higher-risk loans in rapidly appreciating areas, anticipating that continued house price increases would reduce the chances of default.

Interest rates in 2004 through 2006 presented borrowers with conflicting incentives. On the one hand, **Figure 2** shows that rates on 30-year fixed mortgages were generally around 6% during 2004 through 2006, low by historical standards. Borrowers had an incentive to use fixed rate mortgages to lock-in these low rates. On the other hand, **Figure 2** also shows that the gap between short- and long-term rates was relatively large in 2004. The larger this gap, the more a borrower benefits from an adjustable-rate mortgage, which tends to follow short-term rates. Also, the benefit of an adjustable rate mortgage is greater if the borrower intends to quickly sell the house or refinance the loan — which coincides with rapidly appreciating housing markets.

The use of mortgage products with introductory periods and adjustable interest rates arguably was a reasonable response to house price appreciation and interest rates in 2004. By 2005, however, short-term interest rates were rising faster than long-term interest rates. Yet, adjustable rates remained very popular. House price appreciation slowed significantly in 2006, yet introductory periods remained popular. The persistence of nontraditional terms could be evidence that some borrowers intended to sell or refinance quickly — one indicator of speculative behavior.

Figure 2. Falling Interest Rates Fueled Housing Markets

Short Term Rates Decline Sharply During 2000-2004



Source: Federal Reserve.

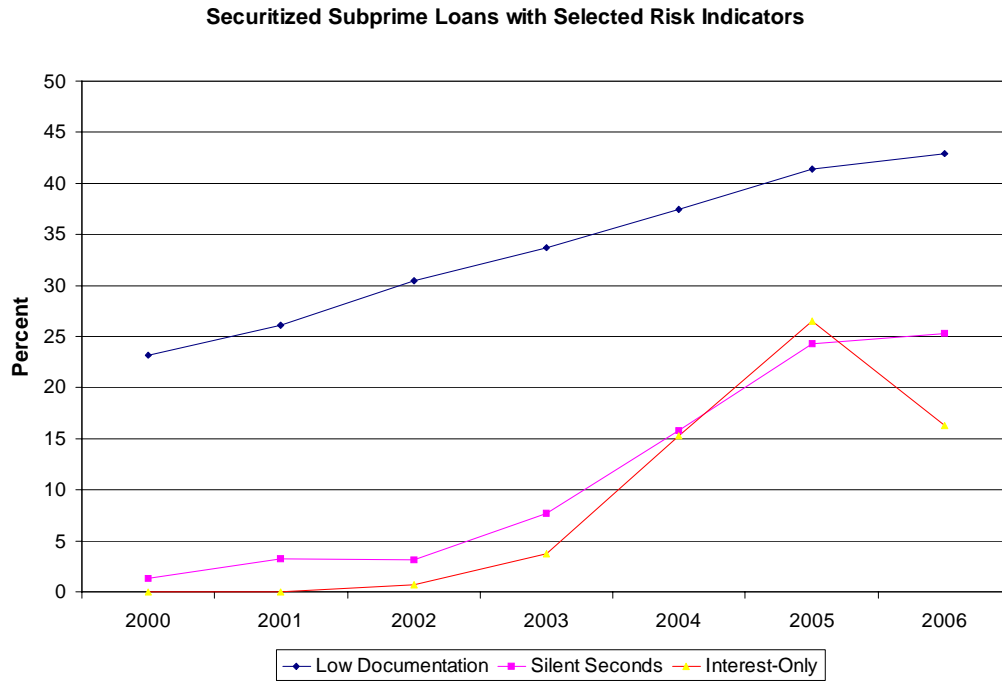
Credit Quality of Resetting Loans Appears Weak

As the reset dates of billions of dollars of subprime mortgages near, analysts want to know the quality of the underwriting that was used when the loans were originated. For 2-28s and 3-27s, this requires information on the risk-characteristics of loans originated in prior years. Information from industry sources suggests that non-agency subprime loans became more risky as the housing boom progressed. For example, **Figure 3** shows that the percent of subprime loans with low documentation doubled between 2000 and 2005.⁵ Similarly, the percent of subprime loans that used silent seconds to avoid private mortgage insurance (PMI) increased from almost none

⁵ "The U.S. Subprime Market: An Industry in Turmoil," Thomas Zimmerman, UBS, [http://www.prmia.org/chapter_pages/data/files/1471_2576_zimmerman%20presentation_presentation.pdf].

in 2000 to 25% of the subprime market by 2006.⁶ **Figure 3** also shows the increased use of subprime loans with interest-only periods, which require higher resets even if interest rates do not rise.

Figure 3. Underwriting Standards Weakened



Source: Compile by CRS from UBS data.

In summary, falling interest rates had two important effects on alternative mortgage markets. First, lower mortgage rates initially helped bid up house prices as households qualified for larger loans, which increased appreciation rates. Second, the incentive to use adjustable rate mortgages increased because short-term rates initially fell faster than long-term rates. House price appreciation and low interest rates, which many expected to continue, encouraged the use of mortgages that reset and have substantially higher future payments. Subsequent increases in interest rates and slowing house prices have resulted in some unsustainable resets and the forecast of more unsustainable resets. Understanding the choice of mortgages containing a reset requires an examination of the features of nontraditional mortgages.

⁶ A silent second is a second loan. It is often used as a substitute for a downpayment so that the first loan receives a lower interest rate. These loans are also sometimes used so that the first loan will be below the conforming loan limit and eligible for purchase by Fannie Mae and Freddie Mac, but then probably would not be found in this non-agency database.

Features of Nontraditional Mortgages

Discussions of alternative mortgages often focus on some combination of four differences from traditional mortgages. Borrowers increasingly chose one or more of the following features:

- adjustable rates,
- extremely low or zero down payment,
- interest-only payments, and
- negative amortization.

Adjustable Rates

There are many varieties of adjustable rate mortgages (ARMs). One of the simplest forms offers an initial low rate, called a teaser, at the beginning of the loan and then resets after an introductory period. The teaser rate may apply for one year or for as little as one month. The mortgage contract may specify a reset interest rate or may tie the rate to another interest rate by formula. The resulting interest rate may itself be fixed or variable. Teaser rates should be distinguished from fully adjustable rate mortgages. In principle, a 30-year fixed rate mortgage could have a one-month teaser rate without materially affecting the costs and benefits of the mortgage product.

Excluding teaser rates, variable rate mortgages tie the loan to the economy. The future mortgage rate on these loans typically depends on another future interest rate observed in financial markets. The rate might reset each month, each year, or only after several years. The home buyer's mortgage payment would drop if the interest rate dropped but would rise if the interest rate rose. Many adjustable rate mortgages provide for a cap on the amount a rate can rise in any period or over the life of the loan.

Adjustable rate mortgages can be tied to a variety of market interest rates. One common reference rate is the London Interbank Offered Rate (LIBOR). LIBOR rates are determined in the London market for unsecured bank loans. It is a rate that banks charge each other for short term loans (less than 12 months). Typical adjustable rate mortgages will specify a reset date at which time the mortgage rate will adjust to the LIBOR or similar rate plus a predetermined markup.

Extremely Low or Zero Down Payment

Saving enough funds to meet the traditional 20% down payment can be a significant barrier to otherwise credit-worthy potential home buyers. Furthermore, the required down payment grows with the appreciation rate. If home appreciation is growing faster than household income, then it will be difficult for first time home buyers to save sufficiently. Lending programs gradually reduced the required down payment options to 10%, 5%, and eventually 3% of the purchase price. There are mortgages that take this process to its logical conclusion and allow buyers to purchase with no money down. Some programs even roll in closing and other acquisition costs for greater-than-100% financing.

A related practice is using a second mortgage to finance the down payment. Sometimes called piggy back loans or silent seconds, the home buyer uses the second loan to borrow the funds for a 20% down payment. This down payment is enough to improve the interest rate and other terms of the first mortgage. However, the second mortgage carries a higher interest rate and other less desirable features because the first mortgage has prior claim on the collateral. Although the original first-mortgage lender may be aware of the piggy back loan (and may have helped arrange it), subsequent holders of the first mortgage may not be aware of the piggy back loan because lenders often sell the loans they originate to the secondary mortgage market.

Interest Only

An interest-only mortgage allows the home buyer to carry the loan balance for a period of time without having to pay back any principal. The current mortgage payment covers only the monthly interest due on the existing balance. Eventually, the monthly payment must also cover the principal. If the duration of the mortgage is not extended, then the payments will have to amortize the remaining balance over a shorter period of time. Therefore, a homeowner choosing to pay only the interest for a few months increases the monthly payment for later months.

Negative Amortization

Unlike interest-only mortgages which leave the loan balance unchanged, a mortgage with negative amortization allows the borrower to increase the loan's principal by paying less than the current interest due. The remaining interest is added to the loan balance. Future payments are then recalculated based on the increased principal. The homeowner gets lower current payments but at the cost of greater debt and higher future payments.

These four features of alternative mortgages are not mutually exclusive. There are option mortgages which allow borrowers to choose each month to pay a fully amortizing amount, an interest-only amount, or a negatively amortizing amount. Interest-only mortgages that use an adjustable rate when the introductory period ends are also common. The increased use of these mortgages and innovative combination of features has drawn the attention of federal regulators.

Federal Agency Actions on Alternative Mortgages

Financial Regulatory Institution Guidance

Several federal banking agencies, including the Federal Reserve, the Office of Thrift Supervision (OTS), the National Credit Union Agency (NCUA), the Federal Deposit Insurance Corporation (FDIC), and the Office of the Comptroller of the Currency (OCC), oversee mortgage originations by financial institutions. These agencies are all part of the Federal Financial Institutions Examination Council (FFIEC), and issued a joint guidance statement (the 10/06 Guidance) for alternative

mortgages on October 4, 2006.⁷ This guidance applies to federally regulated financial institutions but not to many non-bank lenders in the subprime sector. In addition to inter-agency guidance, the Federal Reserve revised Regulation Z under the Truth in Lending Act (TILA) in July 2008. Regulation Z applies to all mortgage lenders.

October 2006 Inter-Agency Guidance

Issues and Comments. The FFIEC agencies are responsible for overseeing both the consumer protection mandates of the Truth in Lending Act (TILA) and the safety and soundness of their regulated institutions. The agencies recognized that alternative mortgages have existed for some time but were concerned that products with possible negative amortization were being offered to a wider spectrum of borrowers by greater numbers of lenders. The 10/06 Guidance addressed three areas of concern: underwriting standards, risk management, and consumer protection. The 10/06 Guidance specified that lenders must tighten underwriting standards to manage risk. Lenders must also provide clear information to consumers to ensure consumer protection, but the guidance explicitly rejected imposing the doctrine of suitability.⁸

The comment period drew a range of views on the proposal that became the 10/06 Guidance. Some depository institutions and industry groups argued against additional restrictions on alternative mortgages. They pointed out that alternatives to the traditional 30-year fixed rate mortgage have been successfully used for many years. Some argued that alternative mortgages contribute to market flexibility in a changing economy. Some also argued that lenders had the incentive and the capability to appropriately manage the risks.

Critics of alternative mortgages encouraged more stringent limitations. Some argued that an agency guidance would not be effective enough because it would not apply to lenders regulated at the state level. These critics argued for new federal legislation. Some consumer groups argued that alternative mortgages were too complex for unsophisticated borrowers to fully understand. Others argued that expanded use of nontraditional mortgages could encourage speculation in real estate and destabilize house prices.

Consumer Disclosure. The 10/06 Guidance addressed some of the commenters' consumer protection concerns. Lenders are to provide full disclosure in plain language. Lenders were already required to give consumers considering adjustable rate mortgages an information booklet published by the Federal Reserve.⁹

⁷ "Interagency Guidance on Nontraditional Mortgage Product Risks," *Federal Register*, vol. 71, October 4, 2006, p. 58613.

⁸ The doctrine of suitability would impose a duty on lenders to ensure that a chosen mortgage product was suitable to the borrower's financial circumstances and goals.

⁹ The Federal Reserve publishes the Consumer Handbook for Adjustable Rate Mortgages (CHARM Booklets). Regulation Z requires that consumers be given CHARM booklets in (continued...)

The 10/06 Guidance now requires that consumers considering other nontraditional mortgages be given similar information including examples of payment comparisons. As of August 2007, the the FFIEC has not issued a mandatory interest-only or negative-amortization counterpart to the adjustable rate booklet, although the Office of the Comptroller of the Currency has a model booklet.

The Government Accountability Office (GAO) also made recommendations for alternative mortgages. On disclosures, GAO found that “although federal banking regulators have taken a range of proactive steps to address AMP [alternative mortgage product] lending, current federal standards for disclosures do not require information on AMP specific risks.”¹⁰ GAO recommended that the Federal Reserve improve its regulations governing disclosures by requiring language that explains the specific risks and features of alternative mortgages.

Prudent Practices. In addition to consumer disclosure, the 10/06 Guidance addresses a number of lending practices that some commenters considered unsafe or unsound. The use of alternative mortgages by less affluent borrowers raised concerns that some home buyers would not be able to sustain payments if housing market conditions changed. The 10/06 Guidance specifically addresses collateral-dependent loans, risk layering, and third-party relationships.

The 10/06 Guidance stated that collateral dependent loans are an unsafe and unsound lending practice. Collateral-dependent loans refers to the practice of lenders to rely solely on the borrower’s ability to sell or refinance the property to approve the loan. An example of this practice would be an interest-only loan to a person with no down payment that resets after three or five years. In the first few years of the loan, the borrower is expected to pay a high interest rate. When the loan resets, the buyer is expected to refinance the loan, by which time appreciation could have provided a down payment which would reduce the interest rate the buyer would be expected to pay.

The 10/06 Guidance requires loans to be underwritten for full risk layering. To understand risk layering, consider a mortgage with an optional negative amortization feature. This option is the equivalent of extending the borrower additional credit without additional underwriting. If the borrower chooses to pay less than current interest in the current month, then the remaining interest is added to the loan balance. For example, a borrower may be extended a \$200,000 loan that could rise to a \$250,000 balance if the borrower pays the minimum each period. The 10/06 Guidance specifies that lenders consider a borrower’s ability to repay the maximum loan balance assuming the borrower pays only the minimum monthly payment each period. In the example, the lender would have to qualify the borrower for a \$250,000 loan, not a \$200,000 loan.

⁹ (...continued)

the shopping phase if they ask for, or are offered, adjustable rate mortgages.

¹⁰ U.S. Government Accountability Office, *Alternative Mortgage Products: Impact on Defaults Remains Unclear, But Disclosure of Risks to Borrowers Could be Improved*, GAO-06-1112T, September 20, 2006. p. 2.

The 10/06 Guidance also addresses third-party relationships and risk management. Banks and financial institutions often do not originate or hold their loans. Mortgage brokers may market the loans to consumers. Once originated, the loans may be sold to investors in the secondary mortgage market. The guidance requires covered institutions to have strong systems and controls for establishing and maintaining third party relationships. While the industry worried that this would require institutions to oversee the marketing practices of third-parties, the agencies responded that an institution's risk management system should address the overall level of risk that third-party relationships create for the institution.

Federal Reserve Revision of Regulation Z

Consumer Protection Hearings. The Federal Reserve administers the consumer protection laws that apply to all lenders, even non-bank lenders that are not subject to agency guidances. The Federal Reserve used the notice and comment rulemaking procedures to modify protections for consumers in mortgage transactions. After a series of hearings had been held on the Truth in Lending Act and the Home Owners Equity Protection Act, which the Federal Reserve implements through Regulation Z, the Federal Reserve revised rules.

The Board heard testimony focusing on four questions regarding its HOEPA authority: (1) should prepayment penalties be restricted to the introductory periods of resetting loans; (2) should escrow accounts for taxes and insurance be mandated for subprime loans (the practice is common in prime markets; (3) should limitations be put on stated income loans, also known as low-doc loans or even liar loans; and (4) should additional limits be placed on underwriting loans based on a borrower's ability to pay out of household income, rather than the value of the collateral?

Final Rule for Regulation Z. The Federal Reserve issued its final rule for Regulation Z on July 14, 2008. Some of the changes made by the Federal Reserve apply only to higher prices loans whereas others apply to all mortgage loans. In addition, the Federal Reserve adjusted its definition of higher priced loans to account for the effect of the gap between short-term and long-term interest rates, as well as lowering the threshold for designation as higher cost.

The Federal Reserve made several significant changes to the rules that apply to the origination of all mortgage loans secured by a principal dwelling. It bans creditors and mortgage brokers from coercing a real estate appraiser to misstate a home's value. It also bans pyramiding late fees and certain other mortgage servicing practices. In addition, lenders and servicers are required to credit borrowers' mortgage payments as of the date of receipt and provide a statement. Borrowers must receive a good faith estimate of the loan costs, including a schedule of payments, within three days after application for all mortgage loans. Consumers cannot be charged any fee until after they receive the early disclosures, except a reasonable fee for obtaining the consumer's credit history.

Some of the changes to Regulation Z apply only to higher priced mortgages. These include prohibiting a lender from making a loan without regard to borrowers' ability to repay the loan from income and assets other than the home's value (so-called collateral dependent lending). For higher price loans, the new rule requires

creditors to verify the income and assets they rely upon to determine the borrower's ability to repay the loan. It places a ban on prepayment penalties if the monthly mortgage payment can change in the first four years. For other higher-priced loans, a prepayment penalty period cannot last for more than two years. The rule also requires creditors to establish escrow accounts for property taxes and homeowner's insurance for all first-lien mortgage loans.

FHA's Hope for Homeowners Program

Policymakers enacted the Hope for Homeowners Program in July 2008 (H.R. 3221 / P.L. 110-289). This program allows lenders and borrowers to voluntarily refinance troubled mortgages into an FHA-insured loan. To participate, borrowers must certify that their loan was unaffordable as of March 2008 and lenders must agree to write-down the principal of the loan to a more affordable level. The program allows for up to \$300 billion in FHA-insured loans in which the borrower would be responsible for 90% of the new appraised value. The lenders would write-down the loan an additional 4.5% to cover the one time premium and the first annual premium of the FHA insurance. Therefore, the lender must agree to write down the loan to 85.5% of the current appraised value, and in some areas the current appraisal may be significantly below the original loan balance. The FHA loan limit was increased in high cost areas to as much as \$625,000. The act also provided for more flexibility for some of FHA's underwriting criteria.¹¹

Analysis of Nontraditional Mortgages

GAO estimates that interest-only and other alternative mortgages approached 30% of the mortgage market by 2005.¹² Payments on these mortgages will reset to higher levels in the next few years. Although such products were sometimes used in the past by sophisticated borrowers as cash management tools, the recent housing boom saw alternative mortgages offered as affordability products to less sophisticated borrowers. Alternative mortgages were used by less wealthy borrowers in areas of high expected appreciation. The concentration of mortgage resets in time and in location can cause concerns for individual borrowers, for local real estate markets, and for financial institutions.

Payment Resets, Affordability Products, and Planned Refinances

The expanded use of alternative mortgages during the housing boom has created a wave of mortgage resets due in the next few years as the introductory periods expire. Not only do adjustable rate mortgages change their payments as interest rates

¹¹ For a discussion of FHA and related reform proposals, see CRS Report RS20530, *FHA Loan Insurance Program: An Overview*, by Bruce E. Foote and Meredith Peterson, and CRS Report RS22662, *H.R. 1852 and Revisiting the FHA Premium Pricing Structure: Proposed Legislation in the 110th Congress*, by Darryl E. Getter.

¹² *Alternative Mortgage Products*, September 20, 2006.

change, but interest-only mortgages increase their payments when the full amortization period begins. Even if interest rates do not increase much further, the increase in monthly payments is substantial for many borrowers.

Consider a \$200,000 interest-only loan originated at a time when the prevailing mortgage rate is 6.5%. The interest-only period lasts four years then the loan amortizes over the final 26 years at the 6.5 percent rate. The monthly payments during the interest-only period will be \$1,083. The monthly payments increase to \$1,328 after four years. Even though the borrower will not be affected if interest rates rise above 6.5 percent, monthly payments will still rise \$245 per month. **Table 1** compares this hypothetical interest-only loan to a similar fully amortizing fixed rate mortgage. Although the early payments of the interest-only mortgage are lower than the traditional mortgage, the later payments are higher.

Table 1. Payment Reset for Interest-Only Mortgages

Interest Only (I/O) Feature and Payment Increases for \$200,000 Loan at 6.5% Interest				
	Initial Payments	Reset Payments	Change	Percentage Increase
Traditional 30 Year Fixed	\$1,264	\$1,264	\$0	0%
I/O, Reset Year 5	\$1,083	\$1,328	\$245	23%

Source: Table prepared by the Congressional Research Service (CRS).

Unlike interest-only mortgages, adjustable rate mortgages could have declining payments as well as rising payments. Adjustable rate mortgages were very common in the 1980s when interest rates were high and many people expected mortgage rates to fall. The concern with more-recent adjustable rate mortgages is that their original rate was near historic lows so it is probable that the prevailing interest rate will be higher when they reset.¹³ (Interest rate risk will be discussed in greater detail below.) **Table 2** presents sample payment resets after three years for a \$200,000 mortgage if interest rates rise or fall by a few percentage points. If the interest rate was originally 6%, then the monthly mortgage payment is \$1199. If interest rates rise to 8%, then the monthly mortgage payment rises to \$1449. On the other hand, if interest rates fall to 4%, then the monthly payment would drop to \$971.

¹³ Some adjustable rates are tied to short-term interest rates while traditional mortgages are long term. Some sophisticated borrowers choose adjustable or fixed rate mortgages based on the difference between short- and long-term rates, called the yield curve. For these borrowers, the steepness of the yield curve, not the relation of current mortgage rates to their long-term trend, would be the important consideration.

Table 2. Payment Reset for Adjustable Rates Mortgages

Interest Rates and Monthly Payments Fully Amortizing \$200,000 Loan, 30 Years Rate Resets After 3 Years		
	Interest Rate	Monthly Payment
	4%	\$971
	5%	\$1,082
Base Rate	6%	\$1199
	7%	\$1322
	8%	\$1449
	9%	\$1582
	10%	\$1718

Source: Table prepared by the Congressional Research Service (CRS).

Sophisticated borrowers have used alternative mortgages to manage their cash flow for a long time. Consider a person who can qualify for any type of loan and has plenty of savings for contingencies. If the person must move frequently for work, then the person might not care much about the size of later payments because the loan will not extend that long. If a couple starts in a one-bedroom condominium but expects to move when they have children, then they might not want a traditional mortgage. If the person has other interest-rate-sensitive investments, then the person might use the mortgage as a hedge. For example, the holder of adjustable rate bonds would lose if interest rates fell but could offset part of that loss through an adjustable rate mortgage.

Alternative mortgages were marketed as affordability products to lower income and less sophisticated borrowers during the housing boom. This raises concerns that some home buyers applied for more debt than they could qualify for using traditional underwriting standards. Lenders may have qualified them for the greater debt through these alternative products. In some cases, underwriting standards became more lax even using traditional qualifying ratios because the process was based on the early years of an alternative mortgage product's payments. As a result, underwriters are now qualifying people based on the maximum payment, called the fully indexed rate.

Consider again the \$200,000 loan at 6.5% presented in **Table 1**. Traditionally, lenders presumed that there was a cap on the percentage of household income borrowers could devote to housing costs. If that cap was 28%, and the traditional 30-year fixed rate mortgage had monthly payments of \$1,264, then a borrower would need an income of \$54,177 to qualify for the traditional loan. A borrower with a lower income could not qualify for that loan and presumably could not buy the house.

The interest-only loan presents an interesting qualifying issue. If households can devote 28% of income to housing costs, then an income of \$46,428 qualifies for the early years of the loan. However, an income of \$56,950 would be required for the later years of the interest-only loan. **Table 3** compares the income required to

support the monthly payment assuming that households can devote 28% to housing costs. A borrower with only \$46,428 might be tempted to take out a \$200,000 loan using the interest-only product and then refinance the house when the payment reset.

Table 3. Payment Driven Loan Qualification

\$200,000 Loan Using 28% Qualifying Ratio		
Loan Type	Payment	Qualifying Income
I/O Years 1-5	\$1,083	\$46,428
FRM 30 Years	\$1,264	\$54,177
I/O Years 6-30	\$1,328	\$56,950

Source: Table prepared by the Congressional Research Service (CRS).

A cash-constrained borrower's ability to successfully execute the planned refinancing would depend on the housing market. The borrower is relying on the expected appreciation of the house itself to help pay for the house. This is an example of a collateral-dependent loan which the 10/06 Guidance designates unsafe and unsound. It is not known how many of the loans due to reset in the next two years are collateral-dependent loans. The performance of these loans will depend on the housing market.

Reasons for the Resets: Booming House Prices and the Attraction of Alternative Mortgages

U.S. house prices appreciated rapidly in many regions during 2001 through 2005. Nationally, the Office of Federal Housing Enterprise Oversight (OFHEO) house price index (HPI) rose 51% over the five-year period. **Table 4** compares appreciation during the recent boom to appreciation in other five-year periods. The recent housing boom saw the fastest appreciation since 1980. The boom stands out even more when it is adjusted for inflation. Real house prices rose 34% between 2000 and 2005.

Table 4. U.S. House Price Appreciation, 1980-2005

Nominal and Real Change in OFHEO House Price Index (HPI) 5-Year Increments					
	1980-85	1985-90	1990-95	1995-00	2000-05
Nominal HPI	25%	37%	8%	26%	51%
Real HPI	-8%	14%	-9%	12%	34%

Source: Office of Federal Housing Enterprise Oversight (OFHEO)

The distinction between nominal and real house prices is important. Mortgage contracts are almost always specified in nominal terms. This means that a fall in the real price might not cause a borrower to be upside down on the mortgage if inflation is high enough to counteract the real price decline. This scenario occurred in the early 1980s and the early 1990s. On the other hand, analysts considering the return to housing as an investment often focus on real prices.¹⁴ Although real prices can be important for long term trends in the composition of household savings, nominal prices are more important for determining the stress on borrowers as their payment reset date nears.

Prices rose even more rapidly in some markets. **Table 5** compares the annual appreciation rate of some U.S. cities during 2000 through 2006. The extremely rapid rise in certain markets led to concerns that the 1990s stock bubble had been replaced with a housing bubble.¹⁵ For example, Las Vegas house prices rose 34.9% in a single year, 2004. Orlando's house prices rose 32.7% in 2005. Seven of the cities listed in **Table 5** experienced five consecutive years of appreciation rates exceeding 10% per year. Then in 2006, the housing market slowed dramatically, as shown by the significant decline in the appreciation rate in each of the 31 cities listed in **Table 5**.

Table 5. Annual House Price Appreciation, 2000-2006, by Metro Area

	2000	2001	2002	2003	2004	2005	2006	AVG 00-05
US National	8.1%	6.5%	7.1%	8.2%	13.0%	12.9%	2.1%	9.3%
West Palm Beach	8.7	11.2	13.6	17.0	27.1	28.7	0.2	17.7
Los Angeles	8.9	10.5	14.3	19.3	27.0	23.6	4.4	17.3
Miami	9.1	13.0	14.1	15.2	22.7	28.7	8.4	17.1
Washington	11.7	11.3	10.9	14.0	24.2	22.3	2.7	15.7
San Diego	13.4	11.9	16.6	17.7	25.9	8.7	-0.1	15.7
Las Vegas	6.6	5.9	5.9	18.3	34.9	16.6	1.3	14.7
Orlando	8.7	6.9	7.9	9.1	20.4	32.7	5.5	14.3
Phoenix	6.5	5.4	4.9	6.9	22.2	37.0	3.8	13.8
New York	10.8	10.9	11.3	11.8	16.3	16.6	1.9	13.0
San Francisco	19.2	2.9	6.6	6.3	18.9	15.1	1.2	11.5
Philadelphia	7.1	8.5	9.6	11.3	15.9	14.2	3.0	11.1
Boston	13.6	12.5	12.2	10.3	11.6	5.9	-1.2	11.0
Richmond	5.5	5.3	6.5	8.2	13.6	17.8	4.3	9.5
Minneapolis	11.0	10.2	8.3	8.7	9.5	6.7	0.3	9.1
Portland	5.0	4.0	4.0	6.0	12.7	12.6	7.5	8.9
Chicago	6.7	7.4	6.3	7.7	11.1	10.8	2.9	8.3

¹⁴ Robert Schiller's critique of the housing market uses real prices and attempts to adjust for changes in housing quality. See "Be Warned: Mr. Bubble is Worried Again," *New York Times*, August 21, 2005.

¹⁵ When asked about a national housing bubble, former Federal Reserve Chairman Alan Greenspan replied that there was no national bubble but that some markets showed signs of froth. *Testimony before the Joint Economic Committee*, June 9, 2005.

	2000	2001	2002	2003	2004	2005	2006	AVG 00-05
New Orleans	5.9	3.8	6.0	6.4	8.3	14.9	5.4	7.6
St. Louis	6.4	6.3	5.2	6.6	8.6	7.6	1.9	6.8
Birmingham	6.4	3.2	4.7	4.7	6.0	8.9	2.3	5.6
Pittsburgh	7.4	4.8	4.5	5.0	5.3	5.6	0.3	5.4
Denver	12.2	6.2	3.3	2.7	3.9	3.5	1.0	5.3
Kansas City	6.5	5.6	4.6	4.0	5.7	5.5	0.5	5.3
Atlanta	8.4	5.0	4.4	3.6	4.9	5.1	1.6	5.2
Buffalo	6.0	3.8	4.2	5.0	6.5	5.4	2.4	5.1
Nashville	5.2	2.8	2.6	3.7	6.2	9.2	4.8	5.0
Houston	7.1	4.0	4.6	3.4	4.7	5.8	2.8	4.9
Cincinnati	5.7	3.8	3.5	3.4	5.2	4.2	0.9	4.3
Detroit	7.4	5.4	3.6	3.4	3.4	1.8	-3.0	4.2
Dallas	7.1	4.1	3.7	2.1	3.1	4.1	1.9	4.0
Charlotte	5.9	2.4	2.9	2.2	4.2	6.1	4.4	3.9
Cleveland	5.6	3.3	3.6	3.8	4.0	2.6	-0.8	3.8

Source: OFHEO HPI, calculated 1st Quarter to 1st Quarter

Markets with rapid appreciation reduce the ability of first-time buyers to save for down payments. A 20% down payment on a \$200,000 house is \$40,000. If prices rise 10%, then the 20% down payment rises to \$44,000. The down payment becomes a moving target. In areas with rapid home price appreciation, the required down payment may be growing faster than household income. Potential first time buyers may fear being permanently priced out of the market if they do not enter the market as soon as possible.

While rapid home price appreciation may outstrip the savings of renters, an owner's home price appreciation actually increases household savings. Home equity is a form of savings for home owners. Including the growth in home equity, savings rise faster if the household is an owner in a rapidly appreciating market but the household can't become an owner until it has accumulated sufficient savings for a down payment. A mortgage with a low down payment that is designed to be refinanced after a few years could allow the prospective first-time home buyer to get in to the market and take advantage of the house's growing equity.

Rapid appreciation can reduce the time needed for credit enhancement. Lenders typically require some form of credit enhancement if the value of the loan is more than 80% of the value of the property. This loan-to-value ratio (LTV) of 0.8 corresponds with the traditional 20% down payment. One way that buyers with less than 20% down enhanced their credit was through private mortgage insurance (PMI). However, the PMI monthly premium counted towards the funds that underwriters assumed households could devote to housing costs. The more quickly that a household can lower LTV and eliminate the need for PMI, the greater the percentage of the household's total monthly payment can be devoted to paying off the loan.

In rapidly appreciating markets, the effect of growing equity on potential savings and on the need for PMI made alternative mortgages with planned refinances

a potential affordability product. If first time buyers could just get into the rising market, then the growing equity would provide sufficient savings to lower LTV and eliminate the need for PMI by the time they had to refinance. Similar logic applies if buyers replace PMI with a piggy back loan at a higher interest rate because the need for the second loan at a higher rate is eliminated when equity rises.

Table 6 presents the growth of equity and reduction in LTV for a \$200,000 interest-only loan for various appreciation rates. If appreciation rises 10%, then by the beginning of year three the equity increases to \$42,000 and the LTV falls to 0.79. In this case, the buyer who put zero down and paid only interest would be able to refinance into a loan without credit enhancement because the drop in LTV is the equivalent of the 20% down payment. The time required to reduce LTV enough to eliminate credit enhancement decreases as the appreciation rate rises.

Table 6. Appreciation, Home Equity, and Loan to Value (LTV)

Appreciation Contribution to Home Equity \$200,000 House, Zero Down, I/O Loan Reset Year Appreciation Rate (Annual Percent)										
Beginning Year	0% Equity	LTV	5% Equity	LTV	10% Equity	LTV	15% Equity	LTV	20% Equity	LTV
1	0	1	\$0	1.00	\$0	1.00	\$0	1.00	\$0	1.00
2	0	1	10,000	0.95	20,000	0.90	30,000	0.85	40,000	0.80
3	0	1	20,000	0.90	42,000	0.79	64,500	0.68	88,000	0.56
4	0	1	31,525	0.84	66,200	0.67	104,175	0.48	145,600	0.27
5	0	1	43,101	0.78	92,820	0.54	149,801	0.25	214,720	-0.07

Source: CRS Calculations

The preceding discussion showed two ways that zero down payment and interest-only mortgages could have been used as affordability products. First, if qualification is payment driven, then lower-income borrowers could be qualified based on the payments required during the introductory period of interest-only mortgages. **Table 3** showed that a household with \$46,428 income could qualify for the early payments of a \$200,000 loan at 6.5% interest, even though that loan would have traditionally required an income of \$54,177 to qualify. Second, price appreciation during the introductory period could lower LTV, eliminate the need for credit enhancement, and allow the household to devote more funds to the house payment. **Table 6** showed that 10% annual appreciation can eliminate the need for PMI by the beginning of the third year of payments.

Problems arose when the housing market weakened further. Some of these borrowers are not able to refinance prior to their payment reset dates because their houses failed to appreciate at the expected rate.

Negative Appreciation: Consequences for Resets

Borrowers using alternative mortgages to take advantage of appreciation are exposed to the risk that house prices will fail to appreciate or even decline in price. Recall that **Table 5** showed that the rate of appreciation slowed across the country in 2006. In some formerly hot markets, prices declined in 2006 and the first half of 2007. As payment reset dates approach, many borrowers who used alternative mortgages as affordability products will wish to refinance. Their ability to refinance is obstructed, in many cases, by the failure to achieve home equity through price appreciation.

Local factors usually play a dominant role in determining regional house prices. Because of the role the job market plays in household income, analysts assume the local unemployment rate is important even in the absence of other information. For example, David Lereah, chief economist for the National Association of Realtors, emphasized the labor market in a presentation to residents of Charleston, SC. “Your unemployment situation is very positive ... I really don’t know the local industries in Charleston other than tourism, but whatever it is, it’s doing a good job.”¹⁶ Although Lereah went on to discuss migration patterns and other factors, the stress on labor markets is unmistakable.

Because local economies often play such a crucial role in house prices, one might think that the price risks embodied in low down payment mortgages is only a problem if an area’s unemployment rises. While it is true that an increase in local unemployment can help drive down house prices, it is important to note that prices can fall even if the local labor market is healthy. The next sections show how different metro areas can have divergent price trends but that the recent house price slowdown is widespread and independent of local unemployment.

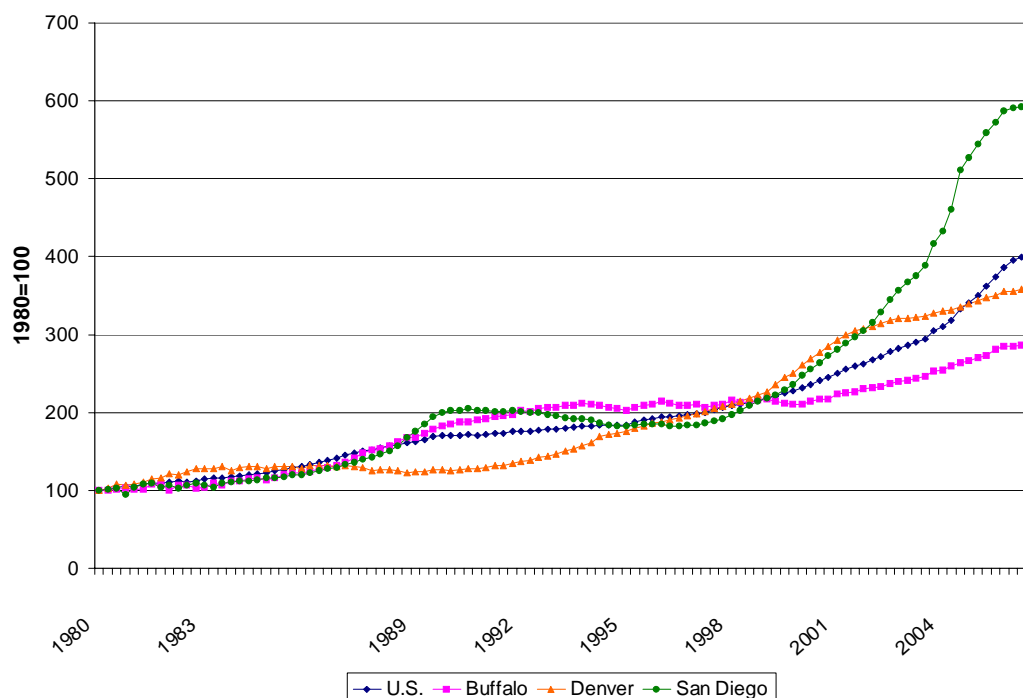
House prices in different metro areas do not always follow the national trend or move in the same direction. Recall again the wide range of appreciation rates for the cities presented in **Table 5**. San Diego’s houses appreciated over 15% per year during 2000-2005, but Denver and Buffalo were closer to 5% per year. **Figure 4** tracks house prices for San Diego, Buffalo, and Denver from 1980 to 2005. They do not follow the national average nor do they follow similar patterns. Denver’s prices rose more quickly in the early 1980s, when San Diego and Buffalo stagnated. San Diego boomed in the late 1980s but then fell in the 1990s. Buffalo’s prices followed a more stable trajectory. Differences in the local economies of the three cities contributed to the divergent paths of home prices.

Many of the biggest house price slowdowns in 2006 cannot be attributed to shocks to local job markets. For example, Boston’s appreciation rate dropped during 2004-2006 even though the Massachusetts labor market remained stable. Boston’s appreciation rate fell from 11.6% in 2004, to 5.9% in 2005, and finally fell 1.2% in the first three quarters of 2006. Yet the Massachusetts unemployment rate remained

¹⁶ “Realtors’ economist rates area ‘very healthy’” *The Post and Courier*, July 18, 2005, p. F8.

close to 5% in all three years.¹⁷ Despite a relatively stable labor market, Boston's house prices stopped appreciating.

Figure 4. Comparison of Appreciation for 3 Cities, 1980-2005



Source: OFHEO House Price Index.

Table 7. Local Unemployment and Slowing Appreciation

Local Unemployment and Slowing Appreciation				
Market	Unemployment		Appreciation	
	10/05	10/06	2005	2006
Phoenix	4.2%	3.4%	37.0%	3.8%
San Diego	4.2	3.6	8.7	-0.1
Los Angeles	4.5	3.9	23.6	4.4
New York	5.8	4.1	16.6	1.9
Miami	3.7	3.5	28.7	8.4
Washington	3.0	2.9	22.3	2.7
Las Vegas	3.7	4.0	16.6	1.3
Orlando	3.1	2.8	32.7	5.5

Source: OFHEO and BLS

¹⁷ Bureau of Labor Statistics, Series ID LASST25000003.

The slowdowns in house price appreciation were widespread and occurred in areas with healthy job markets. **Table 7** compares local unemployment rate changes to the slowdown in appreciation for several of the formerly hot housing markets. Notice that the local unemployment rates were relatively unchanged in October 2006 compared to October 2005. Yet the rate of home price appreciation fell precipitously in each market. **Table 7** shows that the rate of appreciation experienced by home buyers while they are choosing their mortgage can decline drastically even if the local economy remains healthy.

Zero or negative appreciation in an otherwise healthy economy is a problem for borrowers who made very low down payments. If they used a piggy back loan to avoid PMI or used an interest-only loan and planned to refinance when they reached an LTV of 0.8, then they may have become upside-down on the mortgage. Borrowers with little savings are finding it difficult to refinance or sell a house before the reset date because their LTV has not improved (i.e., declined). **Table 8** shows how declines in house prices affect the LTV of zero-down borrowers for a \$200,000 interest-only loan.

Table 8. Negative Appreciation, Equity, and Loan to Value (LTV)

Negative Appreciation and Increasing Debt Burdens \$200,000 House, Zero Down, I/O Loan Reset Year 5										
	0%		-1%		-2%		-3%		-4%	
Begin Year	Equity	LTV	Equity	LTV	Equity	LTV	Equity	LTV	Equity	LTV
1	\$0	1.00	\$0	1.00	\$0	1.00	\$0	1.00	\$0	1.00
2	\$0	1.00	\$-2,000	1.01	\$-4,000	1.02	\$-6,000	1.03	\$-8,000	1.04
3	\$0	1.00	\$-3,980	1.02	\$-7,920	1.04	\$-11,820	1.06	\$-15,680	1.08
4	\$0	1.00	\$-5,940	1.03	\$-11,762	1.06	\$-17,465	1.09	\$-23,053	1.12
5	\$0	1.00	\$-7,881	1.04	\$-15,526	1.08	\$-22,941	1.11	\$-30,131	1.15

Source: CRS Calculations.

If house prices depreciate 3% per year for two years, then the zero-down, interest-only borrower presented in **Table 8** will owe \$11,820 more than the house is worth. Recall that one reason a borrower might have been attracted to the interest-only loan was because the borrower did not have the savings for a down payment. When the introductory period ends and the reset date arrives, the borrower's payments will rise. In this hypothetical example of a \$200,000 interest-only loan in a period of 6.5% interest rates, **Table 1** shows that the reset payment would rise \$245 per month after four years. The borrower must either find an additional \$245 per month to maintain the current mortgage or \$11,820 to cover the reduction in equity and try to refinance even if interest rates do not rise.

Interest Rate Risk

Although the risk of slowing house price appreciation is already a reality, interest rates are still relatively low. Problems could become more severe for

consumers that used adjustable rates if mortgage rates rise despite Federal Reserve attempts to lower short term rates. A common form of alternative mortgage employs adjustable interest rates. Adjustable rate mortgages shift the risk of rising interest rates from the lenders to the borrowers. **Table 2** showed how a rise in interest rates could increase the payment on an adjustable rate mortgage. However, adjustable rate mortgages allow borrowers to benefit when interest rates fall. The availability and popularity of adjustable rate mortgages have changed with changing macroeconomic conditions.

When lenders held most of their loans in their own portfolio, fixed rate mortgages imposed significant costs when interest rates rose. The lenders' own costs of funds depended on the short-term interest rates prevalent as time progressed.¹⁸ However, the lenders' income from their mortgages depended on the interest rates prevalent at the time the mortgages were originated. This is called borrowing short and lending long. Rising interest rates increase the lenders' cost of funds but the lenders' incomes do not rise. In response to strains on the banking sector as interest rates rose in the late 1970s and early 1980s, Congress encouraged wider use of adjustable rate mortgages.¹⁹

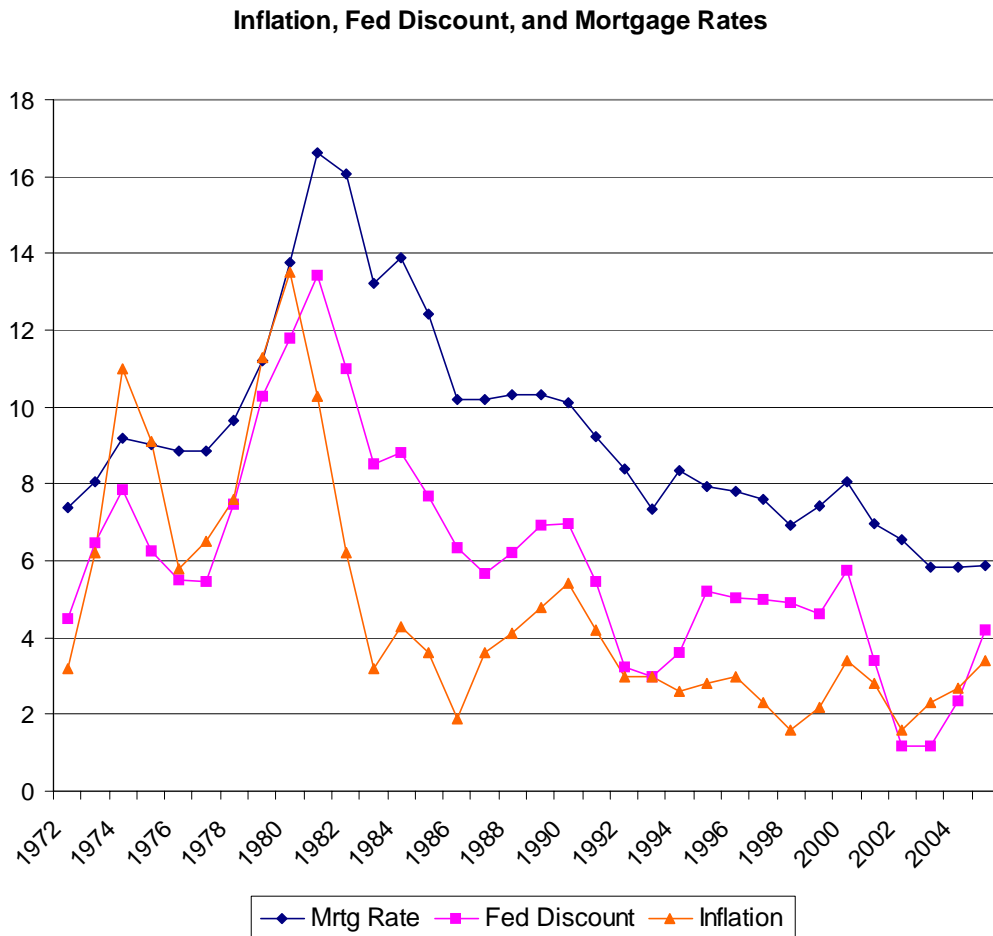
Mortgage rates are affected by conditions in the macroeconomy. Although the Federal Reserve does not directly set long term interest rates such as mortgage rates, Federal Reserve policy can determine short term interest rates and influence inflation. The mortgage rate incorporates expectations of future inflation because mortgages are repaid over long periods. **Figure 5** compares inflation, mortgage rates, and the Federal Reserve discount rate since 1972. The three are related but notice that the steep rise in the discount rate after 2003 has resulted in only a minor rise in mortgage rates during the same period.

The 1980s exemplify an environment conducive to adjustable rate mortgages. Mortgage rates began to decline as the fear of inflation subsided. Expecting mortgage rates to fall, more people turned to adjustable rates. For example, 61% of the conventional mortgages originated in 1984 were adjustable.²⁰ Mortgage rates then declined from over 13% in 1984 to under 8% by 1993. Once mortgage rates stabilized, the popularity of adjustable rate mortgages declined. For example, only 12% of mortgages originated in 2001 were adjustable rates. This relatively longstanding response of borrowers to changing macroeconomic conditions distinguishes adjustable rate mortgages from the use of interest-only mortgages as affordability products described earlier.

¹⁸ Many lenders now sell their mortgages to investors in the secondary market reducing exposure to rising interest rates.

¹⁹ Alternative Mortgages Parity Act, 1982. 12 U.S.C. sec. 3801.

²⁰ Federal Housing Finance Board, *2006 Mortgage Market Statistical Annual - Volume 1*, p. 17.

Figure 5. Mortgage Rate, Discount Rate, and Inflation, 1980-2005

Source: Federal Reserve.

The pattern of adjustable rate mortgages during the recent boom suggests that borrowers accepted interest rate risk at a time when interest rates were at historic lows. **Figure 5** showed that the mortgage rates prevailing in 2003-2005 represented 30-year lows. Consumers hedging against interest rate changes would be expected to lock in the historic low rates by borrowing at fixed rates. Yet the share of adjustable rates rose from 12% in 2001 to 34% in 2004, perhaps to take advantage of the large gap between short and long term interest rates. Although still well below the 61% share in 1984, the rising number of ARMs during a period of exceptionally low interest rates means that consumers shouldered additional interest rate risk as the boom progressed. There is evidence that this interest rate risk is concentrated in the formerly hot markets.

Geographic Correlation of Falling-House-Price Risk and Interest Rate Risk

Which regions are most vulnerable if a shortage of liquidity raises mortgage rates? Concentrated risk is important for cities as well as for financial institutions.

The presence of distressed neighbors affects the price that other sellers can get for their houses. If an area becomes concentrated with borrowers who are unprepared for payment shock and at the same time become upside down on their loans, then downward pressure can be put on housing prices. If this happens, then more homeowners will become upside down on their loans, reinforcing the problem. Exposure to the risk of rising interest rates is geographically concentrated in the areas that may be exposed to the risk of falling house prices.

The Federal Home Finance Board (FHFB) conducts a survey of the use of adjustable rate mortgages. The sample used for the survey excludes many important categories of nontraditional mortgages such as negatively amortizing loans. However, the survey can give some indication of the geographical concentration of some types of alternative mortgages and the exposure of some areas to the risk that inflation and interest rates will increase.

Table 9 uses FHFB data to show the use of adjustable rate mortgages and the recent slowdown in appreciation for 12 metropolitan areas from different parts of the country. The rates reported in **Table 9** are unweighted averages of the five most recent quarters in the FHFB survey.²¹ An area is more immediately exposed to rising interest rates if a higher percentage of its loans will reset interest rates in the near future. By this measure, Dallas and Houston are probably less exposed to the risk that interest rates might rise in the near future while California cities appear more exposed to interest rate risk.

In addition to a rise in interest rates for adjustable rate mortgages, regions could suffer if their lenders and home buyers used low down payments and overestimated the rate at which their houses would appreciate. Prior to the issuance of the 10/06 Guidance, some borrowers may have been using expected appreciation to get into larger houses than they could have otherwise afforded. **Table 9** shows the decline in the rate of appreciation from 2005 to the first three quarters of 2006. To the extent that some borrowers counted on the rate of appreciation prevailing at the time they originated their loan to continue, a sudden deceleration in the rate of growth of prices will delay the time that they can achieve an LTV of 0.8 and get better terms when they attempt to refinance. Miami, California, and New York had comparatively large drops in appreciation and could have home buyers who made large mistakes when projecting appreciation rates.

Even though the appreciation rate might still be comparatively rapid, an unexpected drop in appreciation could still foil the plans of a low down payment buyer. For example, Miami's 2006 appreciation rate is still relatively high at 8%. However, if a zero-down Miami buyer in 2005 planned on appreciation of 20% per year and chose a mortgage that reset after one year, the 8% appreciation rate would not achieve the LTV of 0.8 to allow an improved refinance. The buyer wouldn't be upside down but would still pay more than expected costs because the loan might have to be refinanced more than once. Fees are paid each time a loan is refinanced.

²¹ The FHFB combines some MSAs for reporting purposes so there is not an exact match with the OFHEO price index.

Table 9. Adjustable Rate Mortgages and Price Slowdowns

Loan Resets and Price Slowdown by Metro				
	Share of Adjustable Rates '06	Appreciation Rate		Falling Appreciation '05-'06
		'05	'06	
Atlanta	31%	5%	2%	-3%
Boston	29%	6%	-1%	-7%
Chicago	40%	11%	3%	-8%
Dallas-Ft. Worth	11%	4%	2%	-2%
Denver	36%	4%	1%	-3%
Houston	9%	6%	3%	-3%
Kansas City	16%	5%	1%	-4%
Los Angeles	57%	24%	4%	-20%
Miami	36%	29%	8%	-21%
New York	30%	17%	2%	-15%
San Diego	62%	9%	0%	-9%
San Francisco	65%	15%	1%	-14%

Source: FHFB and OFHEO.

Table 9 does not purport to measure the probability that a particular housing market will suffer severe stress. Instead, it is a very simple indication of a region's exposure to interest rate and falling-house-price risk. Industry analysts use more sophisticated methods to predict the probability that housing prices might fall in a particular market. The United States Market Risk index (USMR) is one such measure.²²

The USMR index takes into account the local job market, recent price acceleration, and the affordability index. Weak job markets and low affordability tend to increase the risk of falling house prices. Stable recent appreciation tends to reduce the risk of falling house prices. **Table 10** presents the market risk index for selected cities. A value of 100 implies a 10% chance that house prices in the area will fall within two years.

²² *Economic Real Estate Trends*, Fall 2006 p. 7. The index is published by the PMI Group which sells private mortgage insurance.

Table 10. Adjustable Rate Mortgages and the Market Risk Index

Metropolitan Area	Share of Adjustable Rates 06	PMI Risk Index
San Francisco	65%	587
San Diego	62%	603
Los Angeles	57%	590
Las Vegas	51%	540
Sacramento	48%	601
Phoenix	41%	353
Chicago	40%	147
Seattle	39%	153
Miami	39%	471
Denver	36%	187
Orlando	34%	313
Tampa	34%	404
Portland	32%	158
Atlanta	31%	201
Milwaukee	31%	140
New York	30%	543
Boston	30%	596
Virginia Beach	29%	413
Minneapolis	27%	393
Detroit	25%	379
Columbus	24%	74
Washington	22%	540
St. Louis	21%	133
Indianapolis	19%	63
San Antonio	17%	78
Kansas City	16%	109
Philadelphia	13%	179
Dallas	11%	89
Cincinnati	9%	72
Houston	9%	88
Pittsburgh	6%	61
Cleveland	3%	74

Source: FHFB and PMI Group.

Table 10 shows that areas with lower risk of falling house prices as measured by the PMI Group's USMR index tend to have fewer adjustable rate mortgages. The markets with a high percentage of adjustable rate mortgages are correlated with higher risk of falling house prices. Statistical analysis shows that the relationship of

the risk of rising interest rates and the risk of falling house prices is positive.²³ There is a geographic concentration of mortgages vulnerable to rising interest rates and risks to any borrowers who made low down payments.

Washington, DC, and Chicago are notable exceptions. Chicago has a relatively high level of interest rate risk as measured by the share of adjustable rate loans but a low level of falling-house-price risk as measured by the USMR. Washington has a high risk of falling house prices but less interest rate risk.

A correlation of ARM share and the risk index does not imply causation. Nor is this a test of a formal model of the determination of regional ARM shares. **Table 10** merely shows that the interest rate risk inherent in adjustable rate mortgages is correlated with the risk of falling house prices identified by PMI's market risk index. The regions using ARMs tend to be the regions most susceptible to changes in macroeconomic conditions such as interest rate changes.

Recent Price Declines

The reversal in housing markets has been more severe than some regulators expected. In late 2006, OFHEO Chief Economist Patrick Lawler, for example, said "house prices continued to rise through the third quarter in most of the country, but generally at only low or moderate rates. The transition from sizzling markets to normal or weak markets has accelerated, and recent drops in interest rates have failed to stem precipitous price changes."²⁴ Although regulators may have been comforted by a study by the FDIC that reinforced the view that a slowdown in housing does not have to result in collapsing local markets, the result in 2008 has been falling house prices across the nation. Of 46 instances of housing booms in U.S. cities since 1978, 21 experienced a subsequent housing bust. In other words, more than half of the observations of housing booms were not followed by housing busts.²⁵ The housing busts that did occur were often associated with declines in the local area's predominant industries. In the present circumstances, however, housing markets declined even in areas with relatively healthy economies.

Conclusion

Mortgages with adjustable rates and interest-only options have been more widely used in recent years. Once only used by the financially sophisticated, products with significant payment adjustments have been marketed to low-income borrowers as affordable products. The performance of these products among lower-income borrowers in the current stressed environment has been problematic.

²³ Statistical analysis of the share of ARMs and the risk index shows a positive and significant correlation. [coefficient =9.2, t-stat =5.7, R-Squared = 0.72, df=30].

²⁴ OFHEO News Release, November 30, 2006.

²⁵ *U.S. Home Prices: Does Bust Always Follow Boom?*, FDIC, February 10, 2005.

The Federal Reserve has issued changes to Regulation Z that may provide improved disclosures for all mortgages, including those with alternative features. In addition, other bank regulatory agencies have issued guidance covering alternative mortgages, but these guidances do not apply to many non-bank lenders in the subprime market. Lenders must disclose adequate information to consumers in plain English. Lenders must take steps to manage the risks of alternative mortgages. These steps include assessing borrowers' capacity to pay the entire potential balance of negative amortization loans and establishing risk management procedures for third party loan partners. Lenders may not rely solely on the ability to sell the property to qualify borrowers for a loan.

By choosing interest-only products, some consumers face the risk of falling house prices as their reset period approaches. Their prospects do not appear good. By choosing adjustable rate mortgages, some consumers have shifted interest rate risk from lenders to themselves. The geographical distribution of alternative mortgages suggests that falling-house-price risk and interest rate risk are concentrated in the same regions. It remains to be seen if interest rates will remain low, but it is clear that some consumers did not adequately prepare for slowing appreciation. Rising numbers of bankruptcies among lenders suggests that many financial institutions also failed to adequately assess relevant risks.