

# Southwest Economy



## Has the Housing Boom Increased Mortgage Risk?

For several years, house price appreciation has outstripped income growth in the United States, with most of the price gains concentrated in the East and West. While moderate increases in house prices often reflect, and contribute to, a region's economic and financial health, the steepness of recent price increases has raised concerns. In particular, it has been suggested that borrowers, emboldened by rising house prices, are turning to riskier types of mortgages in order to qualify for the debt necessary to purchase increasingly expensive homes, thereby potentially setting the stage for repayment difficulties in the future.

We examine mortgage characteristics in different regions to assess the extent to which high appreciation in house prices has been associated with the use of riskier types of mortgages. While mortgage products have evolved to include numerous available features, our analysis focuses on the distinction between traditional fixed- and adjustable-rate mortgages (ARMs), given the availability of consistent regional data on traditional

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*INSIDE:  
Financial Crises:  
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*Mexican GDP Falls  
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## Making Sense of Elevated Housing Prices

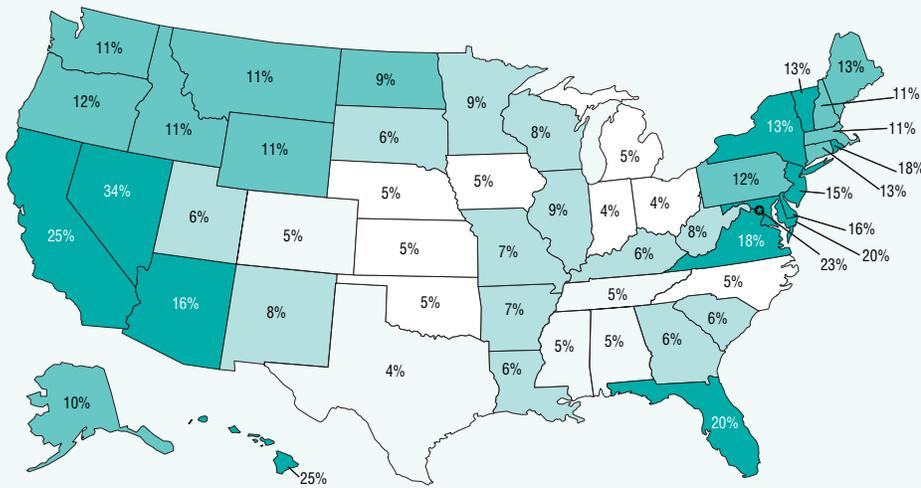
There is widespread concern that housing-price bubbles have formed in several countries, fueled by high demand that stems from low interest rates, the spread of lower-payment mortgage products and portfolio shifts from stocks to real estate. Since 1999, for example, home prices have jumped more than 110 percent in the U.K. and nearly 60 percent in the United States (*Chart 1*).<sup>1</sup>

This issue is important beyond housing markets, because U.S. consumer spending has been bolstered in recent years by mortgage refinancing and households withdrawing equity from their homes.<sup>2</sup> Mortgage innovations

*(Continued on page 7)*

Chart 1

### House Price Appreciation, 2004



NOTE: Darker color indicates greater percent appreciation.  
 SOURCE: Office of Federal Housing Enterprise Oversight, *House Price Index*.

ARM usage. Because ARMs offer initial monthly payments below those required on fixed-rate mortgages at the expense of more variable payments over time, the proportion of mortgages represented by ARMs provides a suitable gauge for assessing the potential link between rising house prices and mortgage risk.

The results are consistent with a direct effect of the housing boom in encouraging the use of traditional ARMs and, by extension, other types of mortgages, such as interest-only loans, that reduce initial payments at the expense of higher payments later in a mortgage's life. While other aspects of our results point to some mitigation of the housing boom's effect in raising mortgage risk, the analysis overall indicates concern is warranted. We also use this framework to understand local housing trends in Texas.

### Regional Nature of the Housing Boom

House prices recently have tended to rise rapidly in the East and West, as shown in Chart 1.<sup>1</sup> Nevada house prices rose 34 percent in 2004, followed by Hawaii, 25 percent; California, also 25 percent; and the District of Columbia, 23 percent. In contrast, house price appreciation has been relatively modest for many other states. Texas experienced an

increase of only 4 percent.

A notable reason for sharp house price appreciation in the East and West is the prevalence in those regions of restrictions on construction and land supply. With housing demand rising in many markets—propelled by general factors such as low interest rates—re-

gions with a tight supply of new homes, resulting from tough zoning requirements or a limited supply of vacant land, have tended to experience the sharpest appreciation.<sup>2</sup> Partly reflecting such building constraints, growth in the stock of housing units has been relatively low in California and especially the Northeast (Chart 2), helping boost house prices in those regions.<sup>3</sup> Conversely, Texas has experienced a substantial volume of home building and high growth in the housing stock, helping explain the state's moderate house price appreciation.

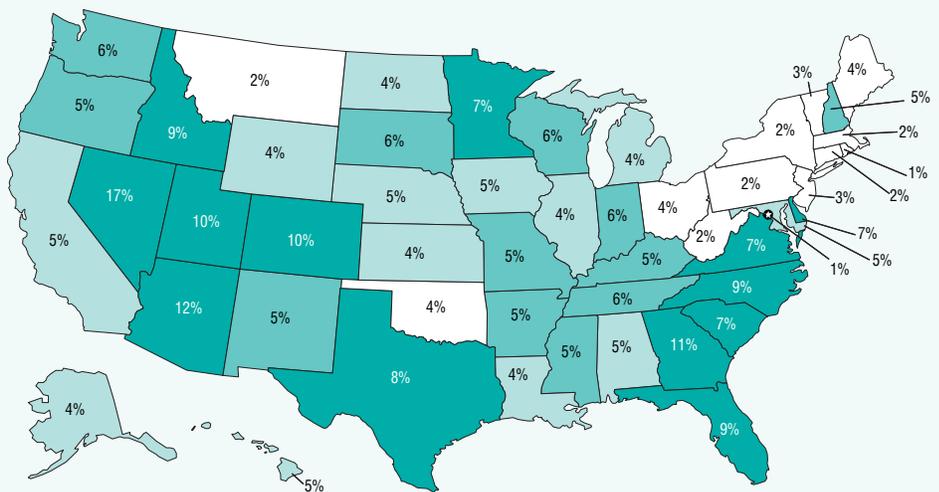
In addition to the supply-side effect of building constraints, other factors may have boosted housing demand in some regions more than others, contributing further to regional disparities in house price appreciation. From an international perspective, anecdotal information suggests the coastal housing markets may have benefited from strong immigration and international investment, with Florida especially popular among European and Latin American investors and California attracting substantial investment from Asia.<sup>4</sup>

### Fixed Versus Adjustable Rates

One of the most notable concerns associated with the housing boom is

Chart 2

### Housing Stock Growth, 2000–04



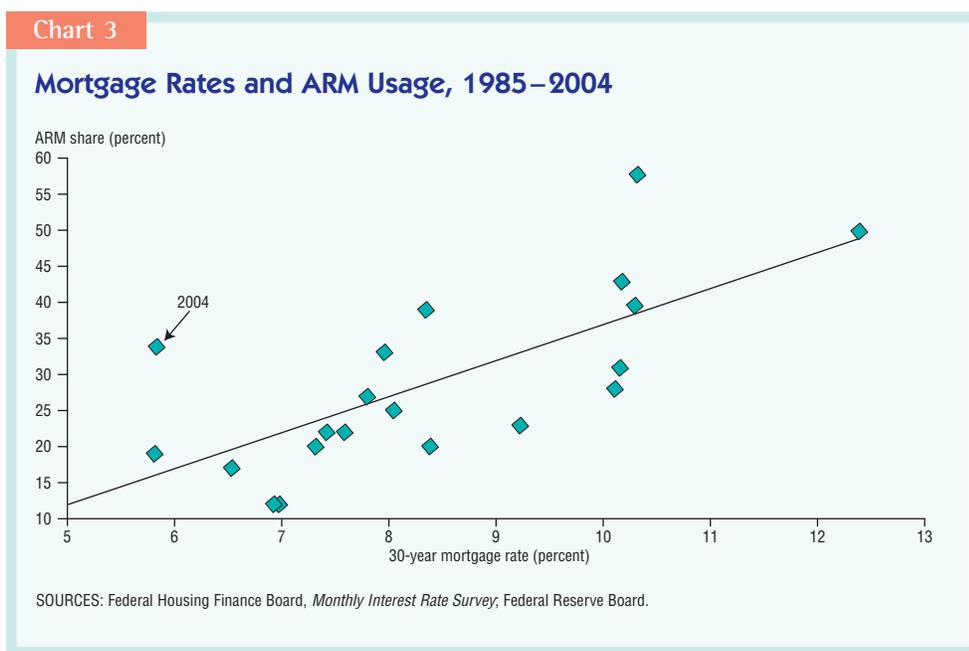
NOTE: Darker color indicates greater percent increase in housing stock.  
 SOURCE: Census Bureau, Population Estimates Program.

based on the perception that despite historically low interest rates, homebuyers nevertheless are frequently opting for mortgage features that reduce the level of initial payments at the expense of higher or more variable payments over time. Supporting this concern is the idea that homebuyers may have been willing to assume the added risk of variability in future mortgage payments, if lowering their initial payments was necessary in order to qualify for the level of debt needed to purchase increasingly expensive homes. Also, homebuyers' expectations of continued increases in house prices may have overshadowed any concern about the potential for higher mortgage payments in the future. In this manner, by feeding expectations of continued gains in house prices, the housing boom may have induced added mortgage risk.

Nontraditional mortgages offering reduced initial payments include interest-only loans, on which borrowers pay only interest for an initial period but then face higher payments, including principal, once the interest-only period ends. Moreover, these higher payments may be boosted further if interest rates rise. Similarly, payment-option mortgages allow borrowers to select from several payment options each month, including payments below the amount of interest due, giving rise to a growing loan balance.

In addition to these nontraditional products, the more standard ARMs also offer initial monthly payments below those required on fixed-rate mortgages, but at the expense of more variable payments. The effect of traditional ARMs in reducing initial monthly payments is magnified by the discount associated with the teaser rate offered on many of these loans, which is set at a constant level, below market rates, for a predetermined teaser period.

By choosing either a traditional ARM or nontraditional mortgage, homebuyers can reduce their initial payments and boost their chances of qualifying for credit, based on their current income. However, such variable-payment mortgages also increase a borrower's risk exposure, heightening the possibility of repayment difficulties should payments increase relative to income. Nevertheless, if homebuyers have come to expect



continued increases in house prices and foresee selling their new home, perhaps within the teaser period while required payments remain relatively low, then they may have viewed ARM risk as negligible.

In analyzing the potential effect of the housing boom in raising mortgage risk, we focus on the share of conventional, fully amortized home purchase loans, or traditional home mortgages, that is represented by ARMs. The distinction between fixed and adjustable rates provides an especially convenient focal point for the analysis; regional data on traditional ARM usage are available on a consistent basis and over a prolonged period, whereas regional data on the different types of nontraditional mortgages are relatively sparse.<sup>5</sup>

Before turning to the regional analysis, we should note that at the national level ARM usage is well below historical highs. As shown in Chart 3, the ARM share in 2004 was near the middle of its 1985–2004 range. Nevertheless, recently the ARM share has actually been substantially higher than its historical relationship with long-term interest rates would predict, as shown by the chart's fitted line. This observation raises the question of why homebuyers have frequently turned to ARMs, despite having the option of a very low fixed-rate loan. Moreover, after accounting for the possi-

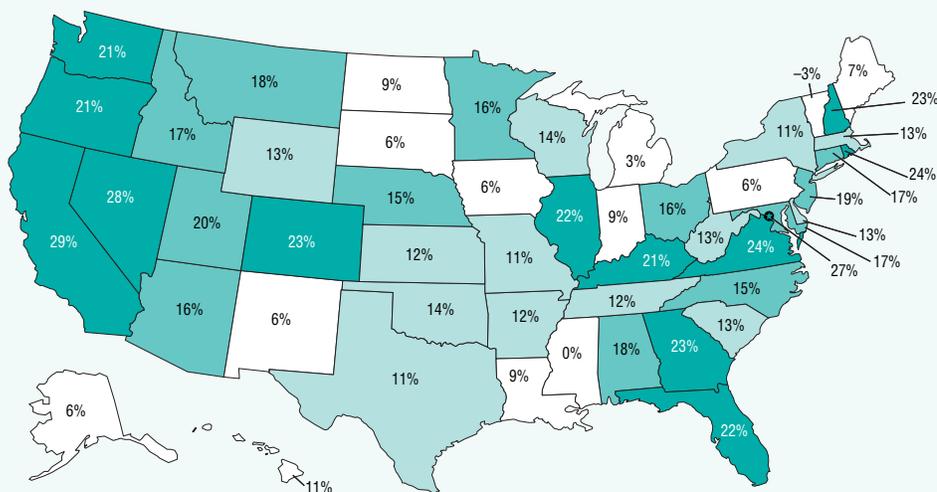
ble effect of the difference between long- and short-term rates on ARM usage, ARM share in 2004 was still much higher than would be expected. Our regional analysis is designed to provide evidence regarding the potential role of the housing boom in helping boost ARM usage above its historical pattern.

**House Price Appreciation and the Change in ARM Share, 2004.** To assess the extent to which sharply higher house prices have contributed to greater use of ARMs, we examine ARM share movements in different regions. Recent gains in ARM usage display a pronounced regional pattern (*Chart 4*). States in the East and especially the West experienced substantial increases in ARM usage last year, whereas the middle of the country recorded relatively small increases.

Most notable, for our purposes, is that the regional pattern of recent changes in ARM usage shown in Chart 4 is highly similar to the regional pattern in house price gains shown in Chart 1. Florida and the Western states are experiencing both a rapid increase in house prices and a relatively strong increase in ARM usage. In Texas, on the other hand, both house price appreciation and growth in the use of ARMs has been relatively mild. The correlation between the regional patterns in the two charts suggests a link between house price appreciation and ARM usage.

Chart 4

### Change in ARM Usage, 2004



NOTE: Darker color indicates greater percentage point increase in ARM share.  
SOURCE: Federal Housing Finance Board, *Monthly Interest Rate Survey*.

To provide further evidence regarding the nature of their relationship, we can also examine various component parts of the overall regional correlation between house prices and ARMs. Toward this end, we now examine in more detail the relationship between house price appreciation and changes in the ARM share, using annual data for each state and the District of Columbia from 1990 through 2004.

**House Price Appreciation and the Change in ARM Share, 1990 to 2004.** As a first step in our historical analysis, we categorize the 765 observations (15 years for 51 regions) into four groups, based on house price appreciation. The first group represents the 25 percent of observations with the lowest appreciation in house prices, while the fourth group contains the 25 percent of observations with the highest appreciation. We then calculate the average annual change in ARM share for each group.

As shown by the first set of bars in Chart 5, observations with the highest appreciation in house prices tended to have the highest change in ARM share, suggesting a direct relationship between the housing boom and ARM usage.

However, some states may have tended to experience high annual changes in ARM share for other reasons

besides high house price appreciation. To help purge the data of such unwanted regional effects and obtain a more direct view of the correlation between house price appreciation and changes in ARM share, we now subtract state averages from our annual observations. The difference between a state's house price appreciation in a particular year and its average appreciation over the entire 15-year period represents a deviation from the state's typical house price experience. Similarly, subtracting away a state's average annual change in ARM share from the change in ARM share that occurred in each year provides a measure of abnormal changes in ARM share. By analyzing deviations from state averages, or mean adjusted data, the potential confounding influence of any fixed regional effects can be avoided.

The second set of bars in Chart 5 shows the relationship between house price appreciation and changes in ARM usage, calculated using the mean adjusted data. In this analysis, all 765 observations are first categorized into four groups, based on mean adjusted annual house price appreciation. The lowest 25 percent of the observations are placed in the first group, while the fourth group contains the top 25 percent of the

observations. As shown in the chart, deviations in the annual change in ARM share from state averages are much higher for observations representing large positive deviations in house price appreciation. This finding further supports the notion of a direct relationship between house prices and ARM usage.

The final set of bars in Chart 5 is expressed in terms of deviations from not only state averages but also time-period averages. After purging the data of all fixed state and time-period effects, house price appreciation and changes in ARM share are still positively correlated, providing further evidence of a direct relationship.

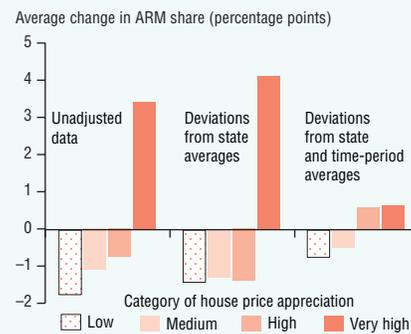
Finally, the first set of bars in Chart 6 represents the average change in ARM share in 2004 for the four groups of states shown in Chart 1, categorized according to house price appreciation. Consistent with what the analysis showed for the entire period from 1990 to 2004, the 2004 change in ARM share was substantially higher for the states with the strongest house price appreciation. And the same is true for the average level of ARM usage in 2004, as shown by the second set of bars in Chart 6.

### Loan-to-Value Ratios

The empirical patterns evaluated so far are cause for concern, because they tend to support the perception that borrowers have been turning to riskier types

Chart 5

### House Price Appreciation and Change in ARM Usage, 1990–2004



SOURCES: Office of Federal Housing Enterprise Oversight, *House Price Index*; Federal Housing Finance Board, *Monthly Interest Rate Survey*; authors' calculations.

Chart 6

**House Price Appreciation, Mortgage Characteristics and Performance, and Change in Rate of Home Ownership, 2004**



SOURCES: Office of Federal Housing Enterprise Oversight, *House Price Index*; Federal Housing Finance Board, *Monthly Interest Rate Survey*; Census Bureau, *Housing Vacancy Survey*; Mortgage Bankers Association.

of mortgages to qualify for the purchase of increasingly expensive homes. However, there are some additional trends that would appear to mitigate, albeit only partially, concerns regarding increased mortgage risk.

In particular, along another key financing dimension, home mortgages in high-appreciation states appear more conservative than in low-appreciation states. There is some indication that leverage, or the proportion of the house price financed and not paid upfront, has tended to be relatively low in high-appreciation states. The third set of bars in Chart 6 shows that the average 2004 share of conventional, fully amortized home purchase loans with a loan-to-value ratio above 90 percent was relatively low for the states shown in Chart 1 as experiencing the greatest house price appreciation.<sup>6</sup> This association between high house price appreciation and low loan-to-value ratios is also apparent in Chart 7; high loan-to-value ratios were relatively uncommon in the East and West last year, whereas in Texas, a low-appreciation state, high loan-to-value ratios were much more prevalent.

Because these loan-to-value data reflect only first mortgages, without accounting for piggyback, or second, loans extended concurrent with a first

mortgage, loan-to-value in high-appreciation states may be substantially understated. Nevertheless, another possibility is that many trade-up homebuyers in high-appreciation states, having benefited from past home price appreciation, may tend to have sufficient accumulated

wealth to make a large down payment.

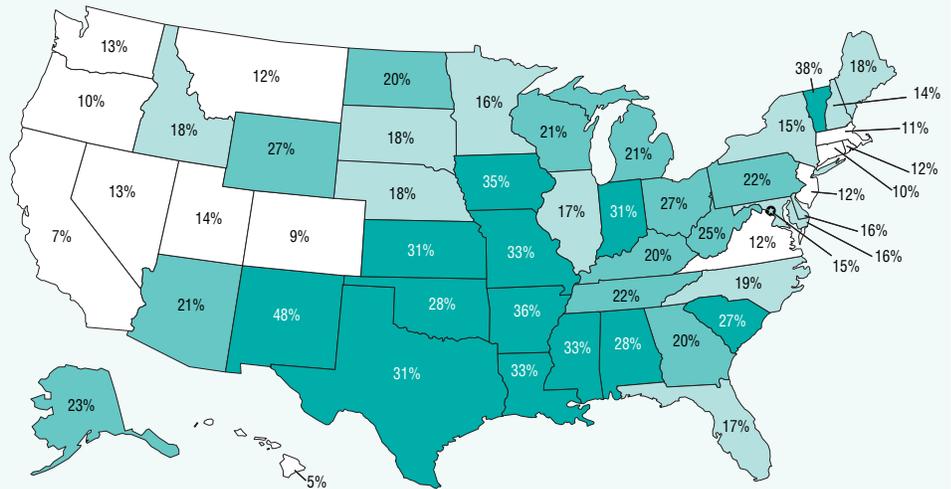
While the lack of data on piggyback loans precludes firm conclusions, the coexistence of ARMs and low loan-to-value ratios in high-appreciation states may make sense. Because trade-up homebuyers in these states have accumulated substantial equity, their loan-to-value ratios may be relatively low. At the same time, though, income levels generally have not kept pace with house prices, perhaps impelling homebuyers to turn to ARMs to qualify for as much credit as possible, based on their current earnings.<sup>7</sup>

**Home-Ownership Rate**

Another interesting pattern in the regional housing data involves the rate of home ownership. Contrary to popular concerns, the available data do not reveal an adverse overall effect of the housing boom in pricing potential buyers out of the market and reducing the rate of home ownership. As indicated by the fourth set of bars in Chart 6, the rate of home ownership actually has risen substantially in high-appreciation states.<sup>8</sup> Of course, the rising home-ownership rates in high-appreciation states do not mean no potential homebuyers have been priced out of the market. Nevertheless, it

Chart 7

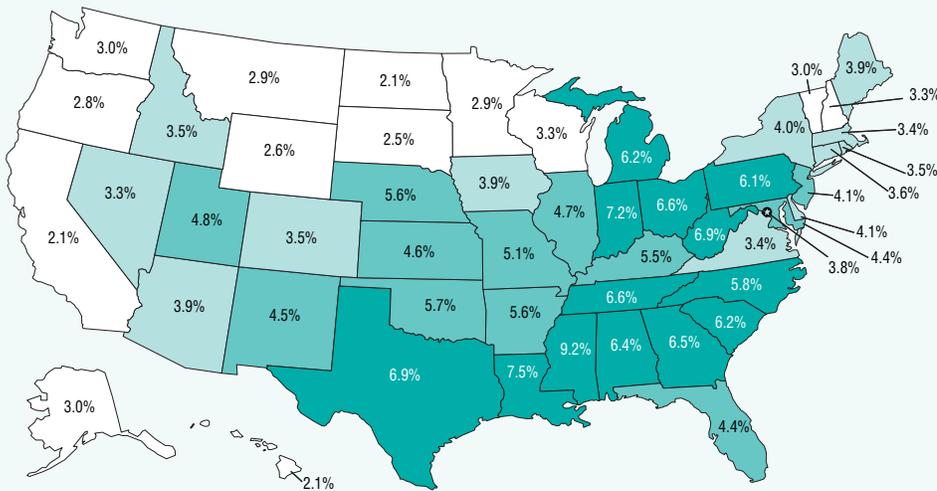
**Mortgages with a Loan-to-Value Ratio Above 90 Percent, 2004**



NOTE: Darker color indicates greater percentage of mortgages with a loan-to-value ratio above 90%.  
SOURCE: Federal Housing Finance Board, *Monthly Interest Rate Survey*.

Chart 8

## Home Mortgage Delinquency Rate, 2004



NOTE: Darker color indicates greater percentage of mortgages that were delinquent in fourth quarter 2004.  
SOURCE: Mortgage Bankers Association.

- <sup>3</sup> Housing stock growth is computed as the statewide percentage change in the number of housing units from July 2000 to July 2004, based on data from the Census Bureau's Population Estimates Program. Condominiums and apartments are included as part of the housing stock.
- <sup>4</sup> Mark A. Wynne discusses increased immigration generally in "Globalization and Monetary Policy," Federal Reserve Bank of Dallas *Southwest Economy*, July/August 2005.
- <sup>5</sup> ARM share data are from the Federal Housing Finance Board's *Monthly Interest Rate Survey*.
- <sup>6</sup> Loan-to-value data are from the Federal Housing Finance Board's *Monthly Interest Rate Survey*.
- <sup>7</sup> Alan Greenspan, Chairman of the Federal Reserve Board, recently provided further evidence of an association between high house price appreciation and low loan-to-value ratios, after accounting for piggy-back loans, in a speech titled "Mortgage Banking," delivered to the American Bankers Association Annual Convention in Palm Desert, California, on September 26, 2005.
- <sup>8</sup> Home-ownership change data represent the percentage point change from 2000 to 2004 in the proportion of households that are homeowners, based on ownership data from the Census Bureau's *Housing Vacancy Survey*.
- <sup>9</sup> Home mortgage delinquency rate data are from the Mortgage Bankers Association.

remains true that a greater proportion of households are living in their own home, despite higher home prices. ARMs and nontraditional mortgage products that can help potential homebuyers qualify for a mortgage may have contributed to the rising rate of home ownership.

### Conclusion

If one were to judge mortgage risk based on recent delinquency rates, concerns over ARMs and nontraditional mortgages would seem misplaced. As shown by the final set of bars in Chart 6, home mortgage delinquency rates have tended to be relatively low in high-appreciation states, despite the greater prevalence of ARMs.<sup>9</sup> California, a high-appreciation state, had a low delinquency rate in 2004, whereas Texas experienced a substantially higher proportion of past-due home mortgage loans (Chart 8).

But, of course, these delinquency data from 2004 do little to allay concerns over increased mortgage risk in high-appreciation states, in the form of increased usage of ARMs and also non-traditional mortgages. Given the recent rapid increases in house prices, one would not expect to find many signs of credit difficulties; financially strapped borrowers could, if nothing else, simply

sell their homes for a profit, rather than default on their loans. In this manner, rapidly rising house prices can conceal the added risk they engender.

It is the possibility of stagnant or falling home prices in the future, combined with the potential, built into much recent borrowing, for increases in the level of mortgage payments relative to income, that gives rise to concern.

—Jeffery W. Gunther  
Robert R. Moore

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### Notes

- <sup>1</sup> House price appreciation is computed as the statewide percentage change in the Office of Federal Housing Enterprise Oversight's *House Price Index* from fourth quarter 2003 to fourth quarter 2004. The index is based on repeat sales, with location held constant, but is not adjusted for any effect of renovations or add-ons. The index excludes condominium prices.
- <sup>2</sup> John V. Duca discusses building constraints in "Making Sense of Elevated Housing Prices," published in this issue of *Southwest Economy*. Also, Edward L. Glaeser, Joseph Gyourko and Raven E. Saks provide an in-depth analysis of building constraints in "Why Have Housing Prices Gone Up?" Harvard Institute of Economic Research Discussion Paper No. 2061, February 2005.