

# FRBSF ECONOMIC LETTER

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## Falling House Prices and Rising Time on the Market

Much of the current trouble in the housing market has been attributed to the fact that house price appreciation—strong for many years—is finally slowing; indeed, in many markets now, house prices are falling. The mere fact that falling house prices are considered newsworthy is interesting in its own right. In other asset markets, such as the stock and bond markets, prices routinely fluctuate up and down every day. In this *Economic Letter* I argue that the main reason for this difference reflects differences in the liquidity of houses and financial assets as investments. I review the ways in which residential real estate prices and liquidity vary over time and over different states of the economy, discuss the implications of this price and liquidity behavior for consumers and lenders, and provide some estimates of the value of residential houses after adjusting for illiquidity.

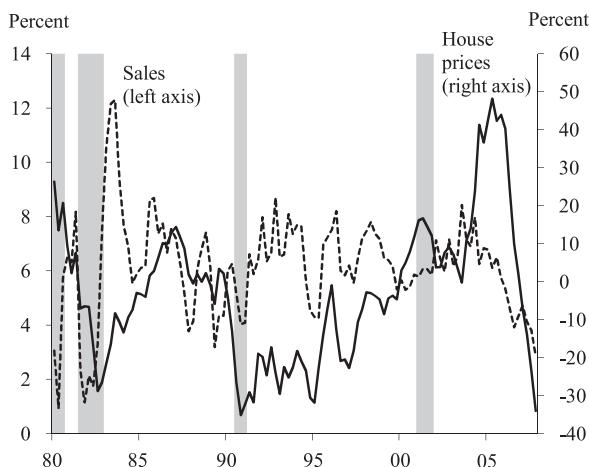
### Illiquidity in housing markets

A key difference between houses and most other financial assets is that houses are far more illiquid, that is, they cannot be sold quickly for what is considered the “market price.” This illiquidity arises in part from the physical nature of houses. In particular, houses are relatively indivisible since they provide a service of flows to the owner that cannot practically fall below a certain level. For example, while an investor can own a very small fraction of a company, an investor would probably not buy and live in a very small fraction of a house. Another reason that houses are relatively illiquid is that homebuyers have differing preferences for housing characteristics, and the stock of available houses reflects this distribution of preferences. Buyers with different preferences for particular features in a house will place different values on the house. Moreover, buyers generally will need to look over the house personally to assess its value to them. Thus, even with the growing presence of online listing services that provide data on the attributes of the properties for sale and pictures for buyers to look at, it is not likely any time soon that most buyers will forgo inspecting a property firsthand before making a bid. Thus, houses do not sell on

centralized exchanges. It takes time for buyers and sellers to find each other.

This illiquidity is reflected in the behavior of three key housing market variables: changes in prices, changes in sales, and changes in time on the market. Figure 1 plots the first two of these variables for the U.S. over the last three decades. Since the beginning of the period, quarterly nominal house price appreciation has averaged about 6% at an annualized rate (real, or inflation-adjusted, appreciation is about 2%) with a standard deviation of 4%. In examining the pattern over time, it is clear that nominal house prices rarely fall; rather, they tend to flatten out for periods of time. Such periods of zero or low price appreciation (which imply real price declines) frequently correspond with recessions, when the prices of capital assets generally tend to fall in value. Some regional markets, particularly coastal cities, show more volatility and tend to show more downward pressure on prices. However, even in these regional markets, prices seem to be more responsive to good economic times than to bad. The figure also shows that sales volumes, by contrast, fall sharply in periods of

**Figure 1**  
Annualized quarterly changes in existing home sales and prices (4-quarter moving averages)



Source: OFHEO and National Association of Realtors.

economic weakness. The volume of sales, evidently, is an important margin for adjustment in the housing market.

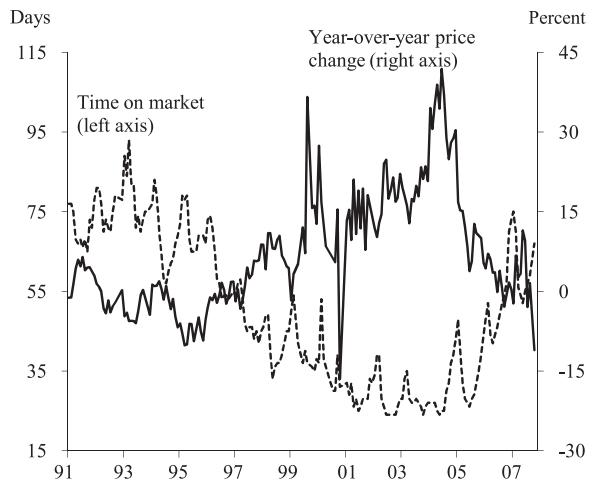
The drop in sales volumes during periods of slow economic growth does not necessarily reflect only a lower number of homes for sale. Typically, houses take a longer time to sell in these periods and inventories grow. This relationship can be seen in Figure 2, which plots changes in median prices and average time on the market for California. Time on the market is the third key housing variable and indicator of the degree of liquidity. Like sales, time on the market can be highly variable. For example, during the early 1990s, when California faced sluggish growth and job loss, average time on the market for houses was nearly three months; in contrast, during the past several years when the economy was doing well, average time on the market was under three weeks.

### The degree of liquidity and the value of housing

The discussion so far shows that, as a housing market weakens and the demand for housing falls, prices are not the only margin for adjustment; sales volumes also may slow, and time on the market may increase. This implies that recorded house prices may not be as representative of actual housing values in bad times as they are in good times. This is important because when people make economic decisions that depend on house values, they tend to rely on observed prices to estimate those values. For example, over the past decade, house price appreciation has increased the wealth of many American homeowners, and this increased wealth can influence their saving decisions. In particular, a homeowner's saving decision would likely be based on what he thought his house was worth if he had to sell it, rather than on a price that is too high to support a normal amount of sales volume. For another example, suppose a bank is considering refinancing a mortgage loan to a household or extending a home equity line. The bank would also want to factor in the liquidity of the market when trying to evaluate the collateral because, in case the household defaults, the bank's expected recovery value on the loan would depend on when that recovery takes place.

If owners of an asset are not sure how long it will take to sell their holdings at the "market price," then how should they value them? For houses, one approach to solving this problem borrows from the research literature on matching in real

**Figure 2**  
California house price appreciation and time on the market

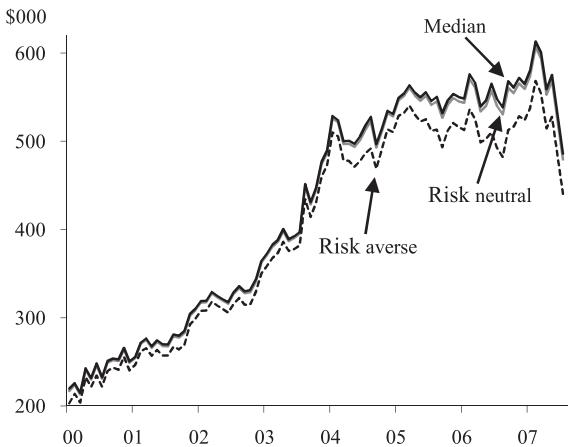


Source: California Association of Realtors.

estate markets (see Krainer 2001). This approach considers a hypothetical seller who puts his house on the market and receives a visit from one potential buyer each day. Potential buyers differ in how much they are willing to pay. The seller would like to find a buyer willing to pay the list price, but this buyer may take time to appear, and the cost of waiting places constraints on how long the seller will be willing to wait to make a sale; for example, in the case of a seller who has vacated the house, he presumably gets little or no service flows from the house but bears the costs of owning it. With a given probability (which depends on the price), a buyer who visits the house will like it enough to pay the list price. Otherwise, the seller tries again the next day, and the next, until the house is sold.

In this setup, there are two different notions of house price. One is an observable value—that is, the price at which the house is sold—because it is recorded by a data collection agency. The other is not directly observable. This is the liquidity-adjusted price, and it factors in the possible waiting time for a sale; it is the price a seller would take to sell the house immediately and avoid the uncertain process of trying to find the buyer who will offer the list price. The lower the probability of a sale in a given day, the longer the expected waiting time until a sale, and the larger the difference between the list price and the liquidity-adjusted price.

**Figure 3**  
**California median and liquidity-adjusted house prices**



Source: California Association of Realtors and author's calculations.

The results of estimating liquidity-adjusted prices in California are shown in Figure 3. The data used for the estimates are from Figure 2, taking observable prices to be median prices and basing the measures of probability of a sale on a given day on the statistics about time on the market. Over time, the gap between actual median prices and liquidity-adjusted prices narrows and widens according to the recorded time on the market statistics. During the early part of the decade, time on the market was very low and the liquidity-adjusted price was close to the actual market price. The implication is that, during this period, reported transaction prices were reliable guides to the values that homeowners would attach to houses as assets in their portfolios.

More recently, however, time on the market in California has lengthened substantially—reaching 65 days in the beginning of 2008—and the liquidity-adjusted price has deviated from the market transaction price. Just how large the deviation is between the liquidity-adjusted price and the ac-

tual price depends on how impatient sellers are and how risk-averse they are about the waiting time for a sale. In this analysis, I am actually understating the risks faced by the seller, because I ignore the possibility that prices could fall during the wait. If households use a discount factor of 10% per annum to discount cash flows and do not care about risk at all, then the difference between the two prices is 1.3%; that is, a risk-neutral homeowner with the median house in California would give up about \$6,300 to avoid the uncertainty of selling in the present market conditions. But, in fact, households probably do care about risk. If we assume that the household is moderately risk-averse (that is, in a coin-flipping bet, the homeowner would prefer to win \$20 with certainty rather than a chance of winning \$0 or \$100) and that it has a discount factor of 10% per annum, then the difference between the list and the liquidity-adjusted prices is about 9%, or \$45,000.

### Conclusion

House prices have begun to fall in many markets. This is especially true when one looks at real house price changes. Going forward, history would suggest that the adjustment to sales volumes and time on the market will be even more extreme than the adjustment to prices. Taking into account the slowing sales volumes and rising time on the market might well imply even lower house values than suggested by the recent transaction price data.

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### Reference

Krainer, John. 2001. "A Theory of Liquidity in Real Estate Markets." *Journal of Urban Economics* 49(1), pp. 32–53.

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## Index to Recent Issues of *FRBSF Economic Letter*

DATE	NUMBER	TITLE	AUTHOR
9/14	07-26-27	Recent Financial Developments and the U.S. Economic Outlook	Yellen
9/21	07-28	Changes in Income Inequality across the U.S.	Regev/Wilson
9/28	07-29	Internal Risk Models and the Estimation of Default Probabilities	Christensen
10/5	07-30	Relative Comparisons and Economics: Empirical Evidence	Daly/Wilson
10/19	07-31	Corporate Access to External Financing	Lopez
10/26	07-32	Asset Price Bubbles	Lansing
11/2	07-33	Labor Force Participation and the Prospects for U.S. Growth	Daly/Regev
11/23	07-34	Financial Globalization and Monetary Policy	Spiegel
11/30	07-35	Fixing the New Keynesian Phillips Curve	Dennis
12/7	07-36-37	The U.S. Economy and Monetary Policy	Yellen
12/14	07-38	Sovereign Wealth Funds: Stumbling Blocks or Stepping Stones...?	Aizenman/Glick
1/18	08-01	Publishing FOMC Economic Forecasts	Rudebusch
1/25	08-02	Publishing Central Bank Interest Rate Forecasts	Rudebusch
2/1	08-03	2007 Annual Pacific Basin Conference: Summary	Glick
2/8	08-04-05	Prospects for the Economy in 2008	Yellen
2/15	08-06	Recent Trends in Economic Volatility: Conference Summary	Notzon/Wilson
2/22	08-07	Economic Conditions in Singapore and Vietnam: A Monetary...	Yellen
2/29	08-08	The Economics of Private Equity Investments: Symposium Summary	Lopez
3/7	08-09	Assessing Employment Growth in 2007	Regev
3/14	08-10	The Corporate Bond Credit Spread Puzzle	Christensen

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