Housing: Boom or Bubble?

BY TIMOTHY SCHILLER

In recent years, the U.S. has seen an extraordinary increase in demand for housing and a rapid rise in house prices. Data show that nationally, the average price of an existing home, adjusted for inflation, rose more than 8 percent in 2004 and 2005, a faster pace than in any previous year. Some people have questioned whether this rapid rise was sustainable, and recent declines in the housing market have made this question more urgent. In this article, Tim Schiller asks whether there was a so-called bubble in house prices or whether fundamental economic factors explain the rapid increase.

Between 2001 and 2005, the United States saw an extraordinary increase in demand for housing and a rapid rise in house prices. In 2005, for the fifth consecutive year, sales of both new and existing homes hit record highs, according to the National Association of Realtors. The national average price of an existing home increased more than 8 percent, after inflation, in both 2004 and 2005, according to the Office of Federal Housing Enterprise Oversight (OFHEO) — the highest annual rates in the history of OFHEO data, which begin in 1975.[1] Some people questioned whether such a rapid rise was sustainable. Slowing in price appreciation and a decline in home sales this year have made this question more urgent. Was there a so-called "bubble" in house prices? Or can the rapid increase be explained by fundamental economic factors? We will review the historical context of house prices nationally and in the region and outline the way economists view fundamental influences on house prices versus a "bubble" in the housing market.

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HISTORICAL TRENDS IN HOUSE PRICES

Data from the OFHEO indicate that the real price of houses (that is, house prices adjusted for inflation) has gone through periods of increase and decrease since the beginning of the data series in 1975, although instances of nominal price declines have been rare.[2] The long-run trend has been up, and in 2005, real house prices reached historical highs. Real house prices are more than 60 percent higher today than they were in 1975. Almost all of that increase has occurred since 1995.

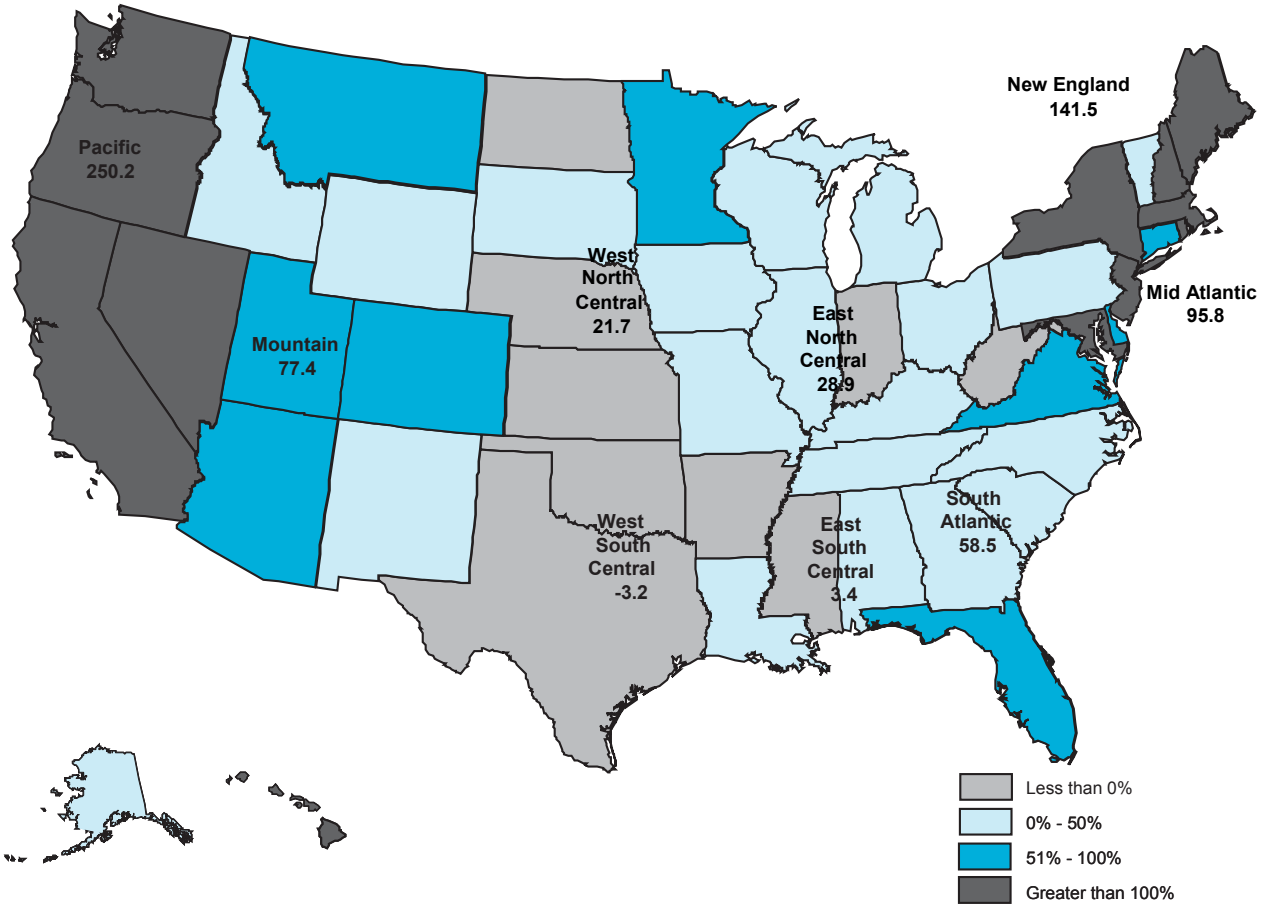
There has been considerable variation among regions of the country (see map). The West and the Northeast have had greater price appreciation than the national average. Within these two regions, the Pacific and Mountain states have had greater percentage increases in real house prices in recent years than they did in the previous episode of rising prices in the 1980s. The New England states have had less price appreciation recently than in the 1980s, and the mid-Atlantic states have had roughly equivalent

[1] The data on house prices compiled by the OFHEO are for single-family homes. The sale prices of repeated sales of the same properties are tracked over time for those properties whose mortgages are purchased or securitized by the Federal National Mortgage Association (Fannie Mae) or the Federal Home Loan Mortgage Association (Freddie Mac). To be included in the data, the mortgage on the sold property must meet the underwriting standards of Fannie Mae or Freddie Mac and cannot exceed a maximum loan limit ($417,000 in 2006). By their nature, OFHEO data include homes that have been improved but do not adjust the appreciation for the value of the improvement. They also exclude homes that have been mortgaged for amounts above the limit, even if they were previously included. Nevertheless, by tracking specific properties over time, the data provide measures of the broad trend of house-price movements.

[2] To measure house prices adjusted for inflation, we use the consumer price index for all urban consumers to deflate the OFHEO data, which are in nominal terms.

MAP

Real House-Price Change for States and Census Divisions 1975-2006



appreciation. This is evident in Figure 1a, where house prices are plotted on a logarithmic (log) scale.[3] Other parts of the country have had lower price appreciation, and in the West South Central U.S., there has been a slight decline in the real price of houses since 1975. Nevertheless, even in the census divisions that have had smaller house-price gains than the nation since 1975, the increase in house-price appreciation has been greater in recent years than it was in the 1980s (see Figure 1b).

The regions with the greatest appreciation have also had the most price volatility, with alternating periods of real price appreciation and depreciation. Limits placed on the supply of new housing by zoning and other land-use regulations have been a factor in this greater-than-average appreciation and in the volatility in some parts of the country.[4] Several states have been identified as having higher price increases and more volatility as a result of limitations on new construction:

[3] Equal vertical distances on a log scale represent equal percentage changes, making it easier to compare changes at different points in time when the price levels are different. For example, on a log scale the distance between 100 and 200 (a 100 percent increase) is the same as the distance between 200 and 400 (a 100 percent increase).

[4] See the article by Edward Glaeser and Joseph Gyourko.

California, Hawaii, Connecticut, New Hampshire, Rhode Island, Massachusetts, New York, and New Jersey.[5] It is interesting to note that all of these states are in or near coastal areas. Evidently, demand for housing in coastal areas has risen, while supply of housing in these areas has been limited by geography and government regulation.

For the three states in the Philadelphia Federal Reserve District (Pennsylvania, New Jersey, and Delaware), the timing of real house prices has followed the same basic pattern as in the nation. The percentage increases and decreases, however, have varied widely, and in each state, the recent run-up in house prices has not been unprecedented. The recent increase has been proportionally similar to the increase that occurred in the 1980s. House-price increases and decreases in Delaware tracked national ups and downs fairly closely. In Pennsylvania, periods of changes in house prices occurred along with national changes, but the increase since 1995 has been less than in the nation. As a result, by 2005, house prices in Pennsylvania had not risen as much since 1975 as in the nation (Figure 2).

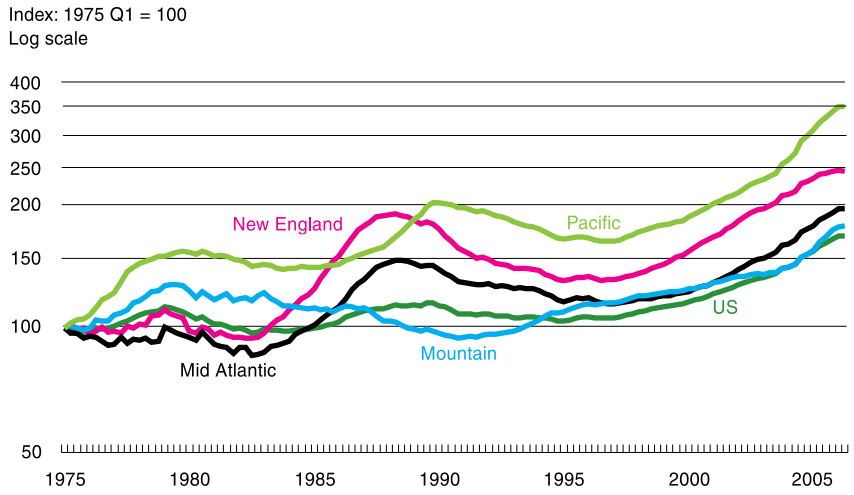
House prices in New Jersey have shown greater volatility than house prices in either Pennsylvania or Delaware and more than the national average. House prices increased more rapidly in New Jersey than in the nation in the 1980s, declined more rapidly in the early 1990s, and have risen more sharply since 1995. Consequently, house prices in New Jersey were more than twice as high in 2005 as they were in 1975, a much greater gain than the national average.

Within the three states of the region, the OFHEO currently reports price changes for 22 metropolitan areas

[5] See the article by Karl Case and Robert Shiller.

FIGURE 1a

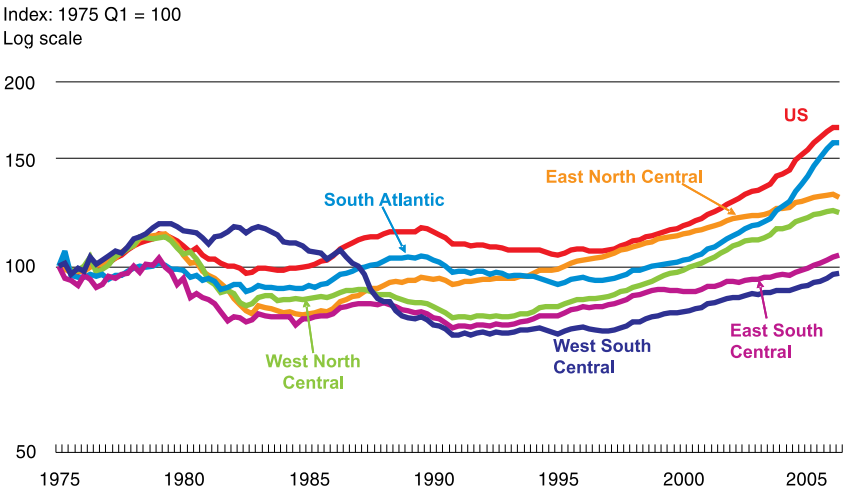
OFHEO House-Price Index (Real) — High Appreciation Census Divisions*



*OFHEO house-price index deflated by CPI.

FIGURE 1b

OFHEO House-Price Index (Real) — Low Appreciation Census Divisions*



*OFHEO house-price index deflated by CPI.

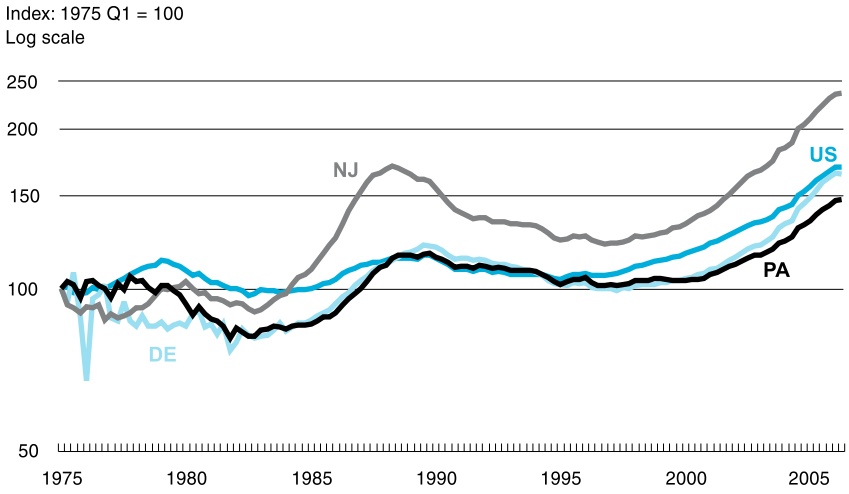
and divisions.[6] The data for all of these areas or divisions extend back only 10 years, although they go back further for some areas. All of these areas and divisions have had real house-price appreciation since 1995, but the range of increases varies widely (Table). The area with the greatest gain, the Ocean City, New Jersey, metropolitan area, had an increase 16 times the increase in the Erie, Pennsylvania, metropolitan area, the area with the lowest gain.

From the historical swings in house prices, we can draw four conclusions: (1) House prices have increased in the long run relative to the overall price level, and most of that increase has occurred in the past 10 years. (2) Real house prices do indeed rise and fall, and at the national level, the most recent run-up is unprecedented. (3) Although nominal prices have rarely declined nationally, there have been nominal declines in those areas with greater price volatility. (4) There is a great deal of variation among regions in the volatility of house prices as well as in the long-run rate of increase.

Until this year, the recent rise in house prices has also brought them to levels that are high relative to incomes and rents. These three measures — historically high house prices, the ratio of house prices to income, and the ratio of house prices to rents — are commonly mentioned when asking whether the house-price increase was a "bubble." Are these measures good evidence of this? Do the historical data suggest that the rapid increase in the 2001-2005 period was a bubble? To answer that question, we need to define a bubble.

FIGURE 2

OFHEO House-Price Index (Real) for the Region*



*OFHEO house-price index deflated by CPI.

DEFINING AND IDENTIFYING BUBBLES

As noted earlier, real house prices have risen and fallen over the past 30 years. But mere price increases and decreases do not make a bubble. Economists define a bubble as a rise in price that cannot be explained by fundamental factors influencing price. The most common "nonfundamental" factor driving price increases is a belief that prices will rise in the future. In other words, as Joseph Stiglitz has noted: "If the reason the price is high today is *only* because investors believe the selling price will be high tomorrow — when 'fundamental' factors do not seem to justify such a price — then a bubble exists" (italics in original).[7]

Some analysts who study asset-price behavior have found evidence that in recent years, a growing number of home buyers have become convinced that prices will rise and produce large gains for them.[8]

A rise in house prices in the absence of fundamental factors would suggest that they are in a bubble. But a rise in house prices can also be the result of fundamental factors, that is, objective factors that are economically related to price and influence it. Two fundamental determinants of house prices that can be measured are income and rents. We can look at the price to income ratio of houses and the price to rent ratio of houses to evaluate whether fundamental factors are influencing prices. We do that in the next two sections, and we point out some necessary qualifications in the use of these measures.

[6] A metropolitan area is a county or a group of contiguous counties with an urban core of at least 50,000 in population and close economic ties, as measured by commuting to work, among the counties. A metropolitan division is a county or a group of counties within a large metropolitan area (population of at least 2.5 million) that has a concentration of employment and extensive commuting between adjacent counties. Metropolitan areas and divisions are delineated by the U.S. Office of Management and Budget.

[7] See the article by Joseph Stiglitz.

[8] See the article by Robert Shiller.

TABLE

Real House-Price Appreciation in the Region*

First Quarter 1995 - Second Quarter 2006

Metropolitan Area or Division	Percent Increase
Ocean City, NJ	143.1
Atlantic City, NJ	100.0
Edison, NJ	98.0
New Jersey	86.1
Newark-Union, NJ	83.4
Trenton-Ewing, NJ	72.5
Camden, NJ	65.0
Philadelphia, PA	62.6
Delaware	60.3
United States	58.5
Wilmington, DE	57.6
Vineland-Millville-Bridgeton, NJ	51.4
Allentown-Bethlehem-Easton, PA	47.8
Dover, DE	44.4
Pennsylvania	40.8
York-Hanover, PA	31.8
State College, PA	28.5
Reading, PA	27.9
Lancaster, PA	26.2
Lebanon, PA	22.0
Scranton-Wilkes-Barre-Hazleton, PA	20.9
Harrisburg-Carlisle, PA	19.5
Altoona, PA	18.7
Johnstown, PA	17.7
Pittsburgh, PA	16.5
Williamsport, PA	15.0
Erie, PA	8.8

*OFHEO house-price index deflated by CPI

IS THERE A RELATIONSHIP BETWEEN INCOME AND HOUSE PRICES?

One indicator that has been cited to support the argument that there has been a house-price bubble is that house prices have risen too high in relation to income. Implicit in this argument is the idea that there is a stable, or fundamental, ratio of house prices to income, and that when this ratio has been exceeded, house prices are in a bubble and, absent a rise in income, are liable to fall. Is this a valid argument?

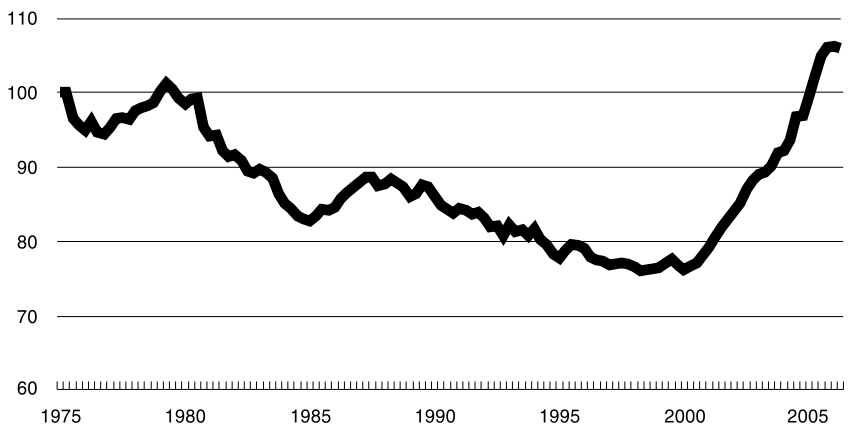
Research on the history of house prices and income does not support the existence of a stable ratio of prices to income. The ratio of house price to income trended downward during most of the period from 1975 to 2000, with brief rising episodes in the late 1970s and 1980s, before it began a strong increase, which has only recently flattened out (Figure 3). Over the years for which house-price data are available, statistical tests indicate that there is no consistent relationship between house prices and income.[9] Therefore, although income could be a fundamental factor influencing house prices, the ratio of house prices to income does not appear to be stable or exact. Thus, we cannot draw any conclusions about the sustainability of house prices from the level of income.

The economics of housing markets alerts us to why income is unlikely to completely determine house prices. Housing is considered a normal good in economics; that is, as income rises, more housing is demanded (in the form of larger homes or second homes). However, in itself this increase in the amount of housing demanded because of an increase in income does not imply a fixed relation between income and the price of a constant-quality house. If the supply of housing can be readily increased when the demand for housing increases, the amount of housing purchased (for example, the size of the house or lot or the number of houses purchased per capita) will increase with income, and there will be no increase in its price. If the supply of housing cannot be increased readily when demand increases, the increase in demand due to an increase in income will only raise the price. In reality, the housing market is somewhere between these two extremes, so an increase in demand raises prices and increases the amount of housing available at the same time.

[9] See the 2006 article by Joshua Gallin.

FIGURE 3

Index of House Price/Income Ratio*



*OFHEO house-price index and per capita personal income, both deflated by CPI.

The index does not represent the price-income ratio for any specific type of house. Rather, it indexes the ratio of house prices to per capita income at 100 in 1975. It shows how the ratio has changed since 1975 based on changes in house prices as measured by the OFHEO house-price index and changes in per capita income. The chart illustrates that house prices have increased around 6 percent more than per capita income since 1975. However, house prices generally declined relative to income from 1975 to 1999. Since then, house prices have increased around 40 percent more than per capita income.

The housing supply's response to demand varies from place to place. As noted earlier, it appears that it has become more difficult to increase the supply of houses in recent years. This limitation on supply has tended to raise prices more as demand has increased than was the case before the past decade or two. Research indicates that limits on the supply of new housing — zoning and other regulatory restrictions — have been a major factor in limiting the increase in the supply of housing in response to increasing demand.[10] The more restrictive limitation of supply makes historical comparisons of the house price-income ratio inappropriate.

Even if we assume there should be a stable relationship between income and the cost of housing, it is not clear that the purchase price of the house is the correct measure of the cost of housing. The purchase price of a house is the price of an asset, but to the homeowner, the cost of housing is the monthly or annual cost of ownership. Therefore, the correct measure of the cost of housing is one that takes into account all the expenses of homeownership, and this measure is usually called the user cost of owner-occupied housing. (See *The User Cost of Housing.*) We can compare this measure with income and rents to gauge whether the cost of owner-occupied housing has diverged from historical averages or from a fundamental level.

When the recent level of interest rates and the historical average price appreciation rate (as a proxy for expected capital gains) are used to calculate user cost, the current house cost to income ratio is not extraordinarily high relative to its historical range of values. However, the ratio has approached historical highs in some areas, suggesting that there is an element of bubble psychology in house prices in those areas.[11] As in previous periods of rapidly rising house prices, the greatest increases have been in areas on the coasts: for example, many areas in California (such as Oakland, Orange County, San Bernardino-Riverside, and San Diego) and on the East Coast (such as Boston, Miami, and Fort Lauderdale).

HOW ARE RENTS RELATED TO HOUSE PRICES?

We can also use the user cost measure to compare house prices with rents. The cost measure should equal the imputed rent of the house, that is, the value of the housing services it provides, as measured by the market rent the house could bring. If the after-tax user cost exceeds the market rent, it would be less expensive to rent than to buy, and demand to buy should fall, thereby reducing house prices. Therefore, when markets are in equilibrium, the after-tax user cost of an owner-occupied house should be roughly equal to the actual market rent of a comparable renter-occupied house.

In relating house prices to rents, we can think of the house price much like the price of corporate stock, and we can think of the rent like the dividend the stock pays. Historically, periods during which stock prices have been high relative to dividends have been followed by periods during which stock prices grew slowly or declined.[12]

[10] See the article by Edward Glaeser and Joseph Gyourko and the one by Glaeser, Gyourko, and Raven Saks.

[11] See the article by Charles Himmelberg, Christopher Mayer, and Todd Sinai.

[12] See the article by John Campbell and Robert Shiller.

The User Cost of Housing

For a homeowner, the user cost of housing is the cost of providing himself with housing services over a given period. It is generally calculated on an annual basis and as the after-tax cost, since there are a number of tax advantages to homeownership. Several items are included in calculating the annual cost of owner-occupied housing.

(1) The opportunity cost of the investment in a house is the main item, and the calculation depends on how the house is financed. A person who buys a house with cash forgoes the income that could have been earned on an alternative asset with the money used to purchase the house. The opportunity cost should be calculated as the return on a similarly risky asset. The excess of this income, expressed as a rate of return, over the risk-free rate of return represents a risk premium to compensate for the fact that the buyer of a house is exposed to the risk of financial loss (from price depreciation), a risk that a person renting a house does not bear. This return would be included in taxable income, but the rental value of owner-occupied housing is not included in taxable income. Therefore, the opportunity cost of the owner's equity in a house should be reduced by the income tax rate to calculate the after-tax user cost. A person who buys a house relying completely on a mortgage loan makes interest payments equal to the purchase price times the mortgage interest rate. Mortgage interest can be deducted from income subject to tax, so this element of user cost should also be reduced by the income tax rate. If the actual rate of return on nonhousing investments differs from the mortgage rate, the investment return should be used for the cash portion and the mortgage rate for the borrowed portion of the purchase price.*

(2) Costs associated with buying and selling a house (transaction costs) and an imputed compensation to the owner for the fact that houses are not readily sold (houses do not have the liquidity of financial assets, for example) must be estimated and added to the user cost of housing.

(3) Property taxes must be added to the cost of housing but reduced by the income tax rate because they are tax deductible in most cases.

(4) Maintenance costs, including insurance, are another item that must be added to the cost of housing. They are not tax deductible.

(5) The expected capital gain on the house is a benefit to ownership, so the expected amount of this gain should be subtracted from the cost of ownership. For most homeowners capital gains on their primary residence is exempt from federal income tax. However, overly optimistic expectations for capital gains are the impetus for a bubble psychology, and they can drive prices above fundamental values.

* See the article by James Poterba.

Similar behavior might be expected for house prices and rents. So the argument that a house-price bubble exists would take this form: When house prices are too high relative to rents, prices are liable to fall. Of course, the price-rent ratio is not constant over time; like a stock price-dividend ratio, it will vary depending on market interest rates and expectations about future increases or decreases in the level of rent payments. If the price-rent ratio exceeds its appropriate value for a given interest rate, or if expectations about future increases prove to be too optimistic, real house prices are likely to decline. Computing the price-rent ratio with interest rates and average historical increases in rents as of 2005 indicates that house prices have not risen to excessive levels nationally. However, they have risen above historical norms and near bubble levels in some areas, the same areas identified as high priced by the house price-income ratio.[13]

FUNDAMENTAL FACTORS: THE INTEREST RATE AND THE HOUSING PREMIUM

Changes in income and user cost, appropriately measured, can explain

[13] See the article by Himmelberg, Mayer, and Sinai, and the one by Jonathan McCarthy and Richard Peach.

the historical variation in real house prices, including the strong increase of the past few years. They indicate that house prices were not a bubble nationally, although they appear to have risen to near bubble levels in some areas. Can user cost tell us more? The interest rate is an important element in computing the user cost of housing, and it largely influences the rental rate that a landlord would have to charge in order to achieve a market rate of return when renting a house. Therefore, the user cost calculation highlights the sensitivity of fundamental values of house prices to the interest rate.

Mortgage interest rates have trended down throughout most of the recent period of rising house prices. (Conventional mortgage rates generally declined from 1995 to 2004, and they have risen only slightly since.) The decline in mortgage rates is the reason home buyers have been able to pay more for houses without a commensurate increase in the share of their income spent on monthly mortgage payments, a fact reflected in the improvement in the National Association of Realtors' affordability index from 1995 to 2004.[14] The decline in mortgage interest rates also contributes to the rise in the ratio of house prices to rent, as described above (Figure 4). In fact, one could argue that innovations in mortgage financing that have reduced down-payment requirements and closing costs have made house prices even more sensitive to interest rates in the past few years because the interest rate forms a proportionately larger part of the total cost of buying a home.[15]

Another factor contributing to the rise in the house price-rent ratio is an apparent decline in the risk premium that is factored into the user cost calculation. Other causes might be a decline in liquidity premium (the amount owners require to compensate for the difficulty in buying and selling a house) and a decline in transaction costs associated with buying and selling a house. These three factors — risk, liquidity, and transaction costs — are known collectively as the housing premium.

How far could real house prices fall? Using past relationships between house prices and interest rates, researchers have estimated the possible decline in real house prices. Richard Rosen of the Chicago Fed estimates that if mortgage rates rise around one percentage point, real house prices will decline about 6 percent in the year after the increase. An increase of around two percentage points would have an estimated impact more than twice as large, resulting in a decline of around 15 percent within a year.[17]

If the decline in interest rates and the housing premium explain a good deal of the recent rise in house prices, what might happen to prices if the interest rate or the housing premium rises?

If the decline in interest rates and the housing premium explain a good deal of the recent rise in house prices (rising incomes have also been a factor), what might happen to prices if the interest rate or the housing premium rises? Since mortgage interest rates have gone up during the past year, this question takes on some urgency. If interest rates rise, the house price-rent ratio will have to fall, and this is likely to occur through a combination of rising rents and falling real house prices. Research indicates that when the price-rent ratio has risen to high levels in the past, it subsequently fell as rents rose, and the increase in real house prices slowed down or real prices actually declined. Furthermore, research by Joshua Gallin of the Federal Reserve Board suggests that slowing real house-price appreciation (or a decline in prices) was a larger factor in the decline of the price-rent ratio than rising rents.[16]

Other researchers estimate some housing markets will experience larger price declines but over a longer period.[18] An increase in the housing premium would also lead to a decline in prices; some researchers estimate a 10 percent decrease in price for a 0.5 percentage point increase in the housing premium.[19]

REGIONAL VARIATIONS IN THE OUTLOOK

As noted earlier, house-price appreciation and volatility have not been uniform around the nation. Some areas have had higher appreciation over the long term and, occasionally, greater downward moves in real prices than others. If there is, in fact, a period

[14] The index is set to equal 100 when the median family income qualifies for a mortgage on the median price home, assuming a 20 percent down payment at the current mortgage rate. See the website of the National Association of Realtors listed in the References to this article.

[15] See the article by Christopher Mayer.

[16] See the 2004 article by Joshua Gallin.

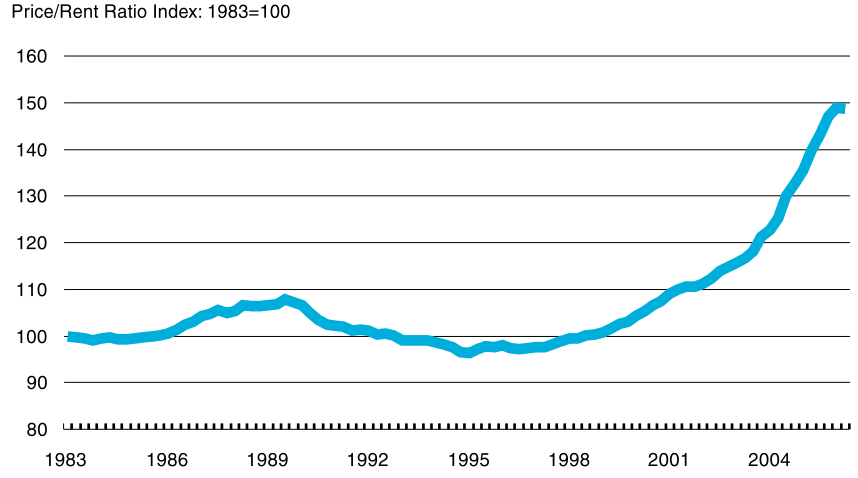
[17] See the article by Richard Rosen.

[18] See Global Insight/National City Corporation.

[19] See the article by Sean Campbell and co-authors.

FIGURE 4

Index of House Price/Rent Ratio*



*House price is OFHEO index. Rent is CPI for owner's equivalent rent (data begin in 1983).

The index does not represent the price-rent ratio for any specific type of house. Rather, it indexes the ratio of house prices to rents at 100 in 1983. It shows how the ratio has changed since 1983 based on changes in house prices as measured by the OFHEO house-price index and changes in owner's equivalent rent as measured by the CPI. The chart illustrates that house prices have increased around 50 percent more than owner's equivalent rent since 1983. Most of the differential increase has occurred since 1999.

of declining real house prices ahead, these areas are more likely to be affected. In some of these areas, prices in excess of fundamental factors, reflected most saliently in a rising price-rent ratio, suggest "bubble" aspects to the run-up in prices.

Researchers generally agree that in most metropolitan areas in California and many in Florida, house prices reached or exceeded the highest levels that can be explained by fundamental factors.[20]

Among the states in the Third District, New Jersey has been noted for high appreciation and volatility, particularly the shore areas of Atlantic City and Ocean City. If real house prices in these areas do enter a period of decline and the historical pattern of price movements are repeated, the downward price movement could extend over several years, during which nominal house prices would slow to a standstill or even decline while the general price level moved up, taking real house prices down.

[20] See the articles by Edward Leamer; John Krainer; and National City Corporation.

SUMMARY

The rise in house prices over the past 10 years can be explained mainly by fundamental factors, namely, rising income and falling interest rates. However, in some areas, mostly on the coasts (including, in our region, New Jersey's coastal areas), prices have risen to estimated levels of peak fundamental value. These are areas where housing demand has been strong and new supply is limited. These areas have seen sharper real price increases and declines than most parts of the country in the past. It is likely they will experience sharper real price declines as demand for homes declines. A key factor affecting demand is the mortgage interest rate. That rate rose through most of 2005. It has not exceeded previous peak levels during the recent surge in house prices. However, if it does continue to rise significantly above its high point of the past several years, the fundamental demand for housing will be reduced. In that event, a repetition of the historical pattern of a multi-year period of stagnant nominal house prices and declining real prices becomes more likely.

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