HSBC
Global Research

Macro
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# A Froth-Finding Mission

## Detecting US housing bubbles

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# Summary

We suggest that about half of the US housing market is frothy and that this 'bubble zone' may be overvalued by as much as 35-40%, after taking into account low interest rates and tax advantages. Current valuations imply a large permanent reduction in the risk premium and/or a sizable step up in future capital gains, not all of which, we think, is justified. The 'bubble zone' accounts for 50% of US GDP, or over USD6trn, nearly the size of the German, French, and UK economies put together. In other words, it's big. Therefore, when these housing bubbles begin to deflate, it is likely to have substantial macroeconomic consequences.

What's troubling is that even a perfect 'soft landing' in the form of flat national house prices would be consistent with a 35-40% collapse in existing home sales. The gush of liquidity from mortgage equity withdrawal would dry up, resulting in a growth drag worth over 3% of GDP. If this adjustment can be managed over many years (and hopefully it will), the economy can avoid recession and get away with soft growth. If the process is squeezed into a shorter time frame instead, then recession is probable, forcing the Fed to once again consider unconventional policy options – a probability that would only rise if the money supply were to decline at the same time the 'bubble zone' deflates.

## The glass is half froth

*Home*Pulse is our new and unique US housing valuation model. It is an effective tool for evaluating the housing 'bubble' debate and we are making it available to clients. Access it at HSBC *Home*Pulse[1]. Users can apply a wide array of valuation techniques to over 200 areas and aggregates, including all 50 states and 150 cities, and one can create customizable 'bubble' and 'non-bubble' zone aggregates. Assumptions for many variables, such as mortgage rates, can be changed, which is useful for scenario-analysis. This will allow users to be better informed about the US housing bubble debate.

[1] http://www.research.hsbc.com/midas/Res/RDV?p=pdf&$sessionid$=6zOnlnEmxv6TSIlBSINU5CN&key=dpc74ypkpv&n=122667.XLS

Using *Home*Pulse, we find evidence that about half the housing market is 'frothy', even after taking into account the benefits of low mortgage rates and tax advantages. We suspect around 40% of US housing units are frothy, but by value, that proportion rises to about 60%. Annual homeowner costs relative to rent or income are higher than in the late 1980s for the US as a whole and as high as the early 1980s (when mortgage rates were over 16%) for the 'bubble zone'. As a result, the required capital gains to financially justify buying versus renting have never been higher for many areas.

Net rental yields are historically low across the US, even relative to real risk-free interest rates, and below 2% for numerous cities on the west coast. Housing risk premiums are unusually low, making housing unusually vulnerable to even small unexpected setbacks, even after factoring in the fact that risk premiums should be lower than historical averages. Expected future homeowner costs relative to expected future rents for an assumed holding period of seven years (roughly the US average) have never been higher for the 'bubble zone', even compared with the early 1980s when mortgage rates were over 16%.

So where's the froth, how widespread is it and by how much are specific housing markets overvalued? The tables on pages 4 and 5 provide rankings of potential over/undervaluation by state and, separately, by city. These valuations are determined by an average of three things: annual homeowner costs relative to income, annual homeowner costs relative to rent and expected homeowner costs for the next seven years relative to expected rental payments for the next seven years.

The rankings are then based on how the average of these valuation ratios look compared to their respective 30-year averages. In other words, knowing that San Francisco is expensive is of little use because as a glamorous and desirable city, it has always been expensive. What we really want to know is whether it is more expensive than it usually is, *after* taking into account factors such as low interest rates, tax advantages, income and rents.

On this basis, California and Washington, DC could be a stunning 50% overvalued, while Rhode Island, Massachusetts, Oregon, Florida, Maryland, New Jersey, Nevada and Hawaii could be roughly 30% overvalued.

By city, Miami, Los Angeles, San Diego and Sacramento are among those that could be roughly 40-60% overvalued, while New York City, Phoenix, Boston, Seattle and San Francisco could be roughly 30-40% overvalued.

On the other side of the coin, who's cheap? We suggest Texas, where the undervaluation is perhaps as big as 25%. The kicker here is that the prospect of permanently higher energy prices has not even begun to be priced in yet. Texas, of course, is always relatively cheap, but it looks cheap relative to its own history too. The same can be said for North Carolina and Ohio, among others.

What could cause a broad correction towards fair value? A decline in expectations of future capital gains (partly engineered by Fed 'jaw boning') and an imminent shift towards stricter standards on exotic mortgages can puncture the bubble, even if mortgage rates stay low. Of course, we cannot rule out a sharp rise in mortgage rates either, but we feel rates may not be playing such a major role. This is about psychology and expectations instead, and we provide some tentative evidence suggesting the "bubble psychology" around the housing market has burst.

The consequences of a punctured housing bubble could be traumatic. Even an apparent "soft landing" in the form of flat nationwide average house prices would cause home sales to dive 30-40%. This would dry up the liquidity gush via mortgage equity withdrawal that has augmented household purchasing power in the past few years. We reckon such equity withdrawal would shift from about USD220bn per annum in recent years to about *minus* USD160bn, a USD380bn drag worth over 3% of GDP. The personal saving ratio would jump and consumer spending would suffer.

The 'topping out' process of the housing price cycle is at hand and may even have already started. In 2006, we are likely to see this trend soften substantially more. Later in 2006 or in early 2007, consumption will begin hurting by enough that policymakers will no longer be able to stand by. The Federal Reserve is likely to step in and start responding with interest rate cuts, likely in 2007. Although cushioning the blow, the rate medicine is unlikely to work in reviving the economy this time around. Although people will refinance to lower debt-servicing where they can, they will lose the motivation for, and find a weary lender of, cash-outs and home equity loans.

A soft economic landing would necessitate only a handful of rate cuts, but the risk remains that a crash in housing causes a hard consumer landing. In such circumstances, Fed funds would be falling well on their way to zero as the risks of deflationary forces once again threaten the medium-term economic outlook.

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*Note: This report is not a recommendation to buy or sell residential property.*

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# Froth-finder: Potential over/undervaluation: states

**2005Q3**

| Rank | Area | Deviation from 30yr average (%) HOC-I | HOC-R | FHOC-R | Average |
|---|---|---|---|---|---|
| | United States (median) | 10 | 9 | 17 | 12 |
| | United States (average)* | 16 | 15 | 24 | 19 |
| | Total Bubble Zone | 37 | 32 | 42 | 37 |
| | Eastern Bubble Zone | 31 | 26 | 35 | 31 |
| | Western Bubble Zone | 45 | 39 | 49 | 44 |
| | Non-Bubble Zone | -9 | -4 | 4 | -3 |
| **1** | California | 57 | 44 | 55 | **52** |
| **2** | District of Columbia | 65 | 38 | 49 | **50** |
| **3** | Rhode Island | 31 | 29 | 38 | **33** |
| **4** | Massachusetts | 35 | 27 | 35 | **32** |
| **5** | Oregon | 30 | 28 | 38 | **32** |
| **6** | Florida | 28 | 29 | 39 | **32** |
| **7** | Maryland | 21 | 30 | 39 | **30** |
| **8** | New Jersey | 30 | 23 | 33 | **29** |
| **9** | Nevada | 25 | 26 | 36 | **29** |
| **10** | Hawaii | 23 | 26 | 35 | **28** |
| **11** | Montana | 16 | 28 | 37 | **27** |
| **12** | Washington | 16 | 27 | 36 | **26** |
| **13** | Arizona | 15 | 24 | 34 | **24** |
| **14** | Virginia | 16 | 23 | 32 | **24** |
| **15** | Maine | 13 | 23 | 32 | **23** |
| **16** | New York | 30 | 15 | 23 | **23** |
| **17** | Delaware | 18 | 19 | 28 | **22** |
| **18** | Vermont | 1 | 22 | 31 | **18** |
| **19** | Illinois | 7 | 15 | 23 | **15** |
| **20** | New Hampshire | 7 | 12 | 20 | **13** |
| **21** | Connecticut | 11 | 7 | 16 | **11** |
| **22** | Michigan | 12 | 7 | 15 | **11** |
| **23** | Minnesota | -3 | 12 | 21 | **10** |
| **24** | Colorado | 1 | 10 | 18 | **10** |
| **25** | Wisconsin | 2 | 8 | 17 | **9** |
| **26** | Wyoming | -9 | 13 | 22 | **9** |
| **27** | Pennsylvania | 2 | 6 | 14 | **7** |
| **28** | Alaska | -6 | 2 | 10 | **2** |
| **29** | Kentucky | -9 | 2 | 10 | **1** |
| **30** | Utah | -18 | 4 | 12 | **0** |
| **31** | South Dakota | -16 | 1 | 9 | **-2** |
| **32** | Idaho | -15 | -1 | 7 | **-3** |
| **33** | North Dakota | -18 | 0 | 9 | **-3** |
| **34** | South Carolina | -11 | -5 | 3 | **-4** |
| **35** | Georgia | -9 | -7 | 0 | **-5** |
| **36** | Missouri | -10 | -7 | 0 | **-6** |
| **37** | West Virginia | -19 | -4 | 4 | **-6** |
| **38** | Iowa | -17 | -5 | 3 | **-6** |
| **39** | Ohio | -9 | -9 | -2 | **-7** |
| **40** | New Mexico | -17 | -5 | 2 | **-7** |
| **41** | Tennessee | -18 | -6 | 2 | **-7** |
| **42** | Kansas | -13 | -10 | -2 | **-8** |
| **43** | Alabama | -18 | -8 | -1 | **-9** |
| **44** | North Carolina | -14 | -12 | -5 | **-10** |
| **45** | Nebraska | -18 | -11 | -4 | **-11** |
| **46** | Indiana | -17 | -13 | -6 | **-12** |
| **47** | Louisiana | -19 | -14 | -6 | **-13** |
| **48** | Arkansas | -23 | -13 | -5 | **-13** |
| **49** | Oklahoma | -29 | -12 | -4 | **-15** |
| **50** | Mississippi | -30 | -15 | -8 | **-18** |
| **51** | Texas | -26 | -26 | -20 | **-24** |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices.
HOC-I = Homeowner costs to income. HOC-R = Homeowner costs to rent. FHOC-R = Future homeowner costs to expected future rents over assumed seven year holding period.

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# Froth-finder: Potential over/undervaluation: cities

**2005Q3**

| Rank | Area | Deviation from 30yr* average (%) HOC-I | HOC-R | FHOC-R | Average |
|---|---|---|---|---|---|
| **1** | Riverside-San Bernardino-Ontario, CA | 62 | 54 | 65 | **60** |
| **2** | Miami-Miami Beach-Kendall, FL (MSAD) | 55 | 52 | 63 | **57** |
| **3** | Nassau-Suffolk, NY (MSAD) | 53 | 47 | 57 | **52** |
| **4** | Los Angeles-Long Beach-Glendale, CA (MSAD) | 62 | 40 | 50 | **51** |
| **5** | Santa Ana-Anaheim-Irvine, CA (MSAD) | 54 | 40 | 51 | **48** |
| **6** | Oakland-Fremont-Hayward, CA (MSAD) | 55 | 37 | 48 | **47** |
| **7** | San Diego-Carlsbad-San Marcos, CA | 52 | 38 | 48 | **46** |
| **8** | Sacramento-Arden-Arcade-Roseville, CA | 55 | 34 | 44 | **44** |
| **9** | Palm Bay-Melbourne-Titusville, FL | 30 | 39 | 48 | **39** |
| **10** | San Francisco-San Mateo-Redwood City, CA (MSAD) | 41 | 30 | 40 | **37** |
| **11** | Providence-New Bedford-Fall River, RI-MA | 35 | 29 | 39 | **35** |
| **12** | Seattle-Bellevue-Everett, WA (MSAD) | 20 | 36 | 45 | **34** |
| **13** | New York-Wayne-White Plains, NY-NJ (MSAD) | 40 | 26 | 35 | **34** |
| **14** | Portland-Vancouver-Beaverton, OR-WA | 27 | 26 | 36 | **30** |
| **15** | Phoenix-Mesa-Scottdale, AZ | 26 | 26 | 35 | **29** |
| **16** | Boston-Quincy, MA (MSAD) | 26 | 26 | 33 | **28** |
| **17** | Newark-Union, NJ-PA (MSAD) | 24 | 25 | 35 | **28** |
| **18** | Baltimore-Towson, MD | 20 | 27 | 36 | **28** |
| **19** | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 31 | 21 | 31 | **28** |
| **20** | Honolulu, HI | 35 | 19 | 27 | **27** |
| **21** | Tucson, AZ | 20 | 25 | 35 | **27** |
| **22** | Edison, NJ (MSAD) | 32 | 19 | 28 | **26** |
| **23** | Las Vegas-Paradise, NV | 25 | 19 | 28 | **24** |
| **24** | Chicago-Naperville-Joliet, IL (MSAD) | 16 | 24 | 33 | **24** |
| **25** | Tampa-St. Petersburg-Clearwater, FL | 23 | 18 | 27 | **23** |
| **26** | Virginia Beach-Norfolk-Newport News, VA-NC | 17 | 20 | 28 | **22** |
| **27** | Charleston-North Charleston, SC | 10 | 21 | 29 | **20** |
| **28** | Orlando, FL | 21 | 13 | 22 | **19** |
| **29** | Philadelphia, PA (MSAD) | 11 | 13 | 22 | **15** |
| **30** | Minneapolis-St. Paul-Bloomington, MN-WI | 11 | 13 | 21 | **15** |
| **31** | Bridgeport-Stamford-Norwalk, CT | 5 | 15 | 23 | **14** |
| **32** | New Haven-Milford, CT | 8 | 11 | 19 | **13** |
| **33** | Detroit-Livonia-Dearborn, MI (MSAD) | 10 | 7 | 15 | **11** |
| **34** | Milwaukee-Waukesha-West Allis, WI | 2 | 10 | 19 | **11** |
| **35** | Denver-Aurora, CO | 1 | 11 | 20 | **11** |
| **36** | Salt Lake City, UT | -4 | 9 | 17 | **7** |
| **37** | Hartford-West Hartford-East Hartford, CT | -2 | -2 | 5 | **1** |
| **38** | Cedar Rapids, IA | -9 | 1 | 5 | **-1** |
| **39** | Nashville-Davidson-Murfreesboro, TN | -16 | 1 | 8 | **-2** |
| **40** | Colorado Springs, CO | -4 | -6 | 0 | **-3** |
| **41** | St. Louis, MO-IL | -6 | -7 | 0 | **-4** |
| **42** | Albuquerque, NM | -12 | -6 | 2 | **-5** |
| **43** | Atlanta-Sandy Springs-Marietta, GA | -8 | -9 | -2 | **-6** |
| **44** | Kansas City, MO-KS | -12 | -8 | 0 | **-7** |
| **45** | Cleveland-Elyria-Mentor, OH | -9 | -11 | -4 | **-8** |
| **46** | Columbus, OH | -13 | -9 | -1 | **-8** |
| **47** | Pittsburgh, PA | -15 | -8 | -1 | **-8** |
| **48** | Buffalo-Niagara Falls, NY | -15 | -8 | -2 | **-8** |
| **49** | Omaha-Council Bluffs, NE-IA | -16 | -12 | -5 | **-11** |
| **50** | New Orleans-Metairie-Kenner, LA | -15 | -13 | -6 | **-11** |
| **51** | Cincinnati-Middletown, OH-KY-IN | -15 | -13 | -6 | **-11** |
| **52** | Greensboro-High Point, NC | -14 | -18 | -12 | **-15** |
| **53** | Indianapolis, IN | -19 | -17 | -10 | **-15** |
| **54** | Charlotte-Gastonia-Concord, NC-SC | -18 | -17 | -11 | **-16** |
| **55** | Austin-Round Rock, TX | -16 | -19 | -12 | **-16** |
| **56** | Memphis, TN-MS-AR | -26 | -20 | -14 | **-20** |
| **57** | San Antonio, TX | -28 | -24 | -18 | **-23** |
| **58** | Houston-Baytown-Sugar Land, TX | -27 | -26 | -19 | **-24** |
| **59** | Dallas-Plano-Irving, TX (MSAD) | -26 | -33 | -27 | **-29** |

Source: HSBC. HOC-I = Homeowner costs to income. HOC-R = Homeowner costs to rent FHOC-R = Expected future homeowner costs to expected future rents over assumed seven year holding period.
* Full 30-year price history not available for some cities. See Table C2 in Appendix C for exact start dates.

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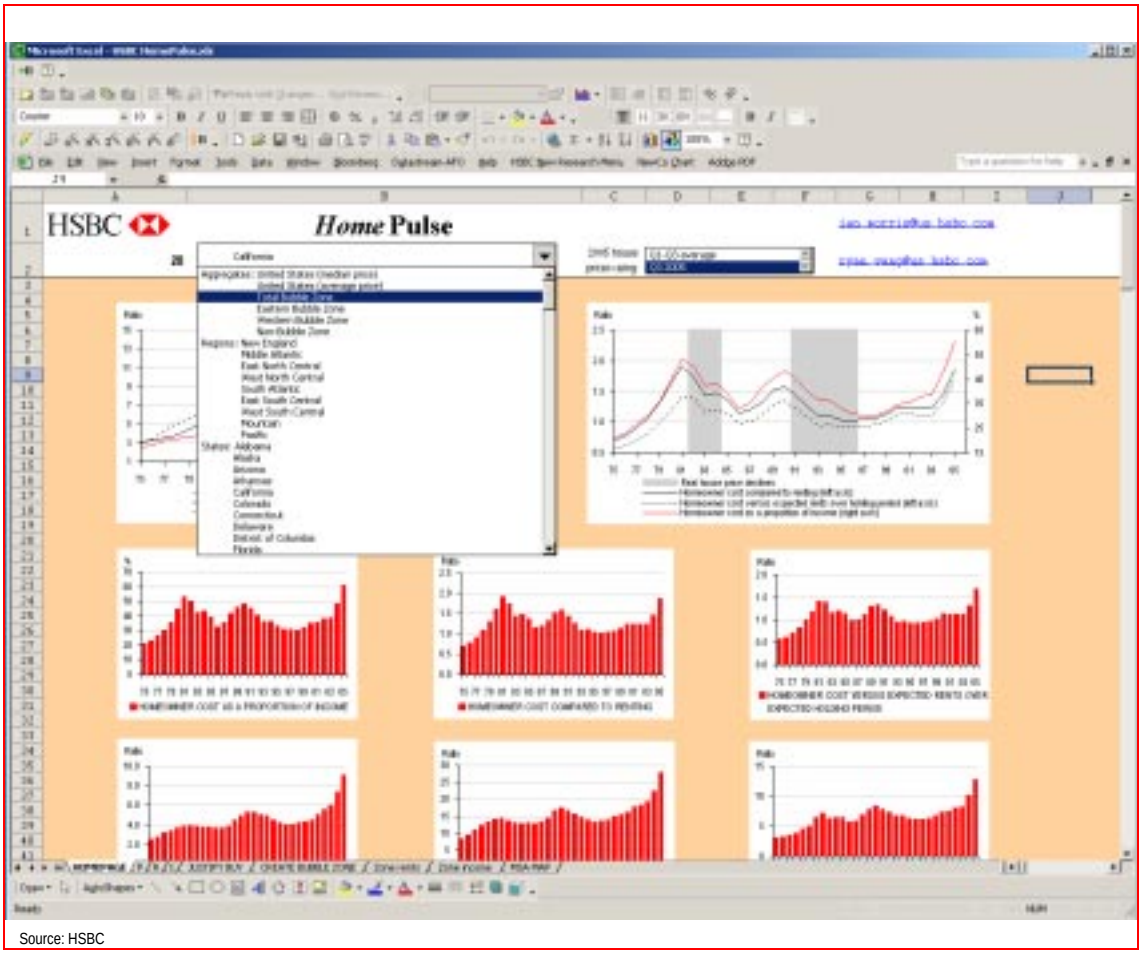
# 1. Introducing *Home*Pulse

- *Home*Pulse is our new US housing valuation tool…
- …that can analyze over 200 areas and aggregates
- Access it at HSBC *Home*Pulse




Source: HSBC

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## A better way to look for froth

US consumption is now regularly viewed by many economists and investors to be dependent on the housing market. And given that mortgage rates are still low, the perception is that even if US housing is overvalued, it may be sometime before it 'bursts'. This report questions that assertion, arguing that valuations and affordability are so stretched that higher mortgage rates are no longer a precondition for boom to turn into bust.

This is our fourth special report on the housing market in the past six years. We highlighted that housing was 'cheap' in *US House Prices Through the Roof* (May 2000) and would do well as an asset class as valuations were attractive.

In *US Real Estate, the Other Bubble?* (January 2002), we noted rising valuations in a growing part of the country but concluded that, "Surprisingly…median house prices in a wide range of cities such as New York, Boston, Chicago, Los Angeles, Atlanta, Dallas and Houston have not yet reached disturbing heights, despite tremendous price gains. Valuations are not as stretched as they were in the late 1980s."

In *The US Housing Bubble – The Case for a Home-Brewed Hangover* (June 2004), we changed our tune and suggested housing had finally entered a bubble phase, which we felt would peak around mid-2005, after around one year's worth of Fed tightening, although we acknowledged that trying to time these things was exceptionally difficult.

This piece, *A Froth-Finding Mission* (January 2006), reaffirms that call, with the humble acknowledgement that our timing of the peak in our June 2004 report was early, but that there is a reasonable chance that in a year's time, it will be clearer that the peak in "froth" was indeed the second half of 2005, although we cannot rule out sometime in 2006.

We will of course be giving our views on timing issues, but we think the real value-added of this research is providing readers the means themselves to make a more advanced analysis of the US housing market. The innovation that facilitates this is our housing valuation tool, *Home*Pulse, a comprehensive and sophisticated approach for scrutinizing US housing market valuations.

It allows users to view the US housing market in over 200 different ways. These include the US in aggregate, nine regional aggregates, the 50 states and 150 metropolitan areas, plus a few more useful aggregates that we have created for the purposes of grouping and comparing potential 'bubble zones' and 'non-bubble zones', as well as to contrast the west coast and east coast 'bubbles', if that is indeed what they are.

*Home*Pulse comes in an excel spreadsheet format and is available to clients. Either request it from your HSBC contact or access it at HSBC *Home*Pulse.

The key challenge was to create a reasonably accurate database for median house prices, median rents and median household income (median measures are better for most of our purposes because averages can be distorted by the 'top end of town').

House prices are constructed with NAR/OFHEO/Census data, rents from HUD/CPI data and household incomes from Census/BEA. See Appendix C for how we put the data together.

After some slicing and dicing of the numbers (for example, ensuring rents and house prices are for a similar quality of house), we think we may have one of the most comprehensive and useful databases available, although we acknowledge that it is not perfect, given limited data on house prices and rents generally.

The model is unique in that it not only allows for the study of over 200 areas and aggregates, but many of the time series go back to the mid-1970s, providing 30 years of rich history in which to compare today's housing valuations to previous house price cycles.

Our valuation approaches are wide-ranging, from simple metrics like price-to-income, price-to-rent and net rental yields, to more sophisticated ones such as comparing the annual cost of homeownership to both rents and income, which takes into account the benefit of today's low interest rates and the tax deductibility of interest payments, among other things.

We also factor in future expectations in some valuations, such as a comparison of the cost of owing a home for the expected holding period of the house (seven years, for instance) to the expected rental payments (for the next seven years), and how that ratio has changed through the last 30 years.

From this information, we can also calculate what nominal (and real) house price growth is required over the holding period to (financially) justify buying the house versus renting it.

We also explore housing risk premiums, calculating them from three different approaches.

Moreover, users can input their own assumptions in *Home*Pulse for the various factors that influence housing valuations, such as mortgage rates, property tax/maintenance rates, marginal tax rates, closing costs, selling costs, the expected holding period of the house, expected rental inflation and various other inputs.

This is useful for scenario analysis (e.g. what happens to New York City or Los Angeles housing valuations if mortgage rates increase 100bp, and how does it compare to the late 1980s?).

All of these different valuation approaches can be done with just one simple mouse click for any of the 200-plus geographical areas and aggregates, allowing for a quick and easy comparison across different locations in no time at all, thanks to our efficient drop-down menu system contained in the excel spreadsheet.

We're confident you'll enjoy experimenting with *Home*Pulse if you're at all interested in the US housing bubble debate.

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# 2. House prices, rental yields and total returns

- Price momentum and total returns have been tremendous…
- …sending rental yields in many places to very low levels…
- …even in comparison to today's low real risk-free interest rates

## How widespread a bubble?

How have house prices behaved in the hottest housing markets versus the rest of the country, and just how big an area we are talking about? Is it macro-relevant?

To begin to answer these questions, we have first split the 50 states (plus the District of Columbia) into two baskets, the potential 'bubble-zone' and the 'non-bubble-zone'.

The criteria to decide which basket a state belonged to were relatively simple. Those picked for the potential 'bubble-zone' have had strong house price growth momentum in the past five years, generally double-digit growth in both nominal and real terms, with a few exceptions. We also take note of states with high price-income and price-rent ratios both in absolute terms and relative to that state's history.

As table 2A shows, these states tend to be on the West and East coasts, but is beginning to spread inland a little (e.g. Arizona, Nevada). On this basis, the potential bubble zone, therefore, is big. It accounts for 43% of US housing units. The non-bubble zone, mainly in the heart of the country, accounts for 57%.

**2A. Bubble and non-bubble zones**

| Total bubble zone | Non-bubble zone |
|---|---|
| ***Eastern bubble zone*** | Alaska |
| Connecticut | Alabama |
| Delaware | Arkansas |
| District of Columbia | Colorado |
| Florida | Georgia |
| Maine | Idaho |
| Maryland | Illinois |
| Massachusetts | Indiana |
| New Hampshire | Iowa |
| New Jersey | Kansas |
| New York | Kentucky |
| Rhode Island | Louisiana |
| Vermont | Michigan |
| Virginia | Minnesota |
| | Mississippi |
| ***Western bubble zone*** | Missouri |
| Arizona | Montana |
| California | Nebraska |
| Hawaii | New Mexico |
| Nevada | North Carolina |
| Oregon | North Dakota |
| Washington | Ohio |
| | Oklahoma |
| | Pennsylvania |
| | South Carolina |
| | South Dakota |
| | Tennessee |
| | Texas |
| | Utah |
| | West Virginia |
| | Wisconsin |
| | Wyoming |

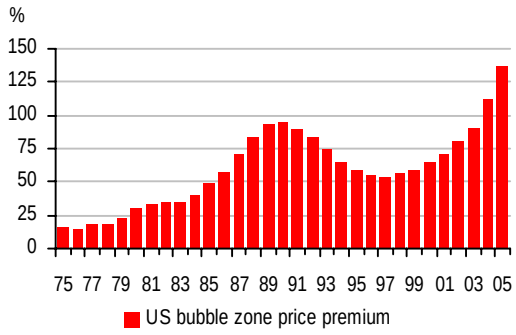
Source: HSBC

However, given properties on the coasts are generally more expensive, the bubble-zone accounts for much more in terms of the *value* of the housing stock.

The 'weighted average' of the 18 median state house prices (plus DC) that make up the bubble zone was USD385,000 in 2005, while the weighted average of the 32 median state house prices of the non-bubble zone was USD162,000. The bubble zone on this basis accounts for 64% of the *value* of houses (up from 55% in 2000), while the non-bubble zone accounts for 36% (down from 45%).

Bubble zone house prices have nearly doubled (up 91%) from USD201,000 in 2000. Meanwhile, non-bubble zone prices are only up a relatively modest 33% from USD122,000 in 2000.

**2B. Bubble zone price premium over non-bubble zone**




Source: HSBC

The price premium for bubble states, in other words, has risen from 65% above that of non-bubble states in 2000 to 138% in 2005, the largest 'bubble premium' since our series began in 1975.

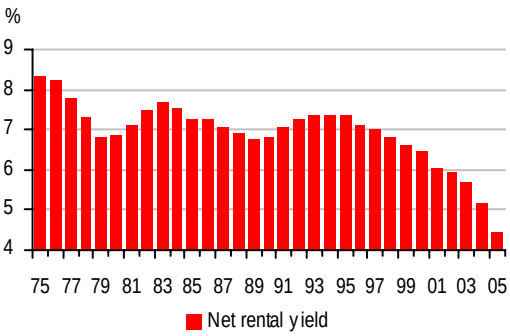
*Because these 'bubble zone' states tended to be (although not always) relatively expensive on a wide-range of other valuation indicators too (as we will see later in the report), for simplicity we have decided to stick with these definitions of bubble and non-bubble zone states throughout this report. Note that one of the advantages of Home*Pulse*, however, is that users can create their own baskets of 'bubble' and 'non-bubble' states if they disagree with us.*

## Net rental yields

For the median US home, the tremendous price growth momentum of the past five years has resulted in net rental yields (before income taxes) declining from 6.2% in 1995 to 3.3% today (gross rental yield of 4.8% less an assumed 1.5% of the home value for annual running costs).

Splitting up the US, the bubble-zone yield is 2.2% while the non-bubble zone is more than double that at 4.8%.

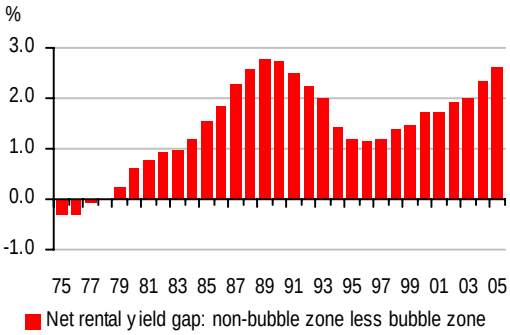
**2C. US net rental yield has fallen**




Source: HSBC

The gap between the two rental yields is just about as large as it was in the late 1980s boom, as shown in the chart below.

**2D. Net rental yield gap**




Source: HSBC

Net rental yields in San Diego, San Francisco, New York City and Las Vegas have fallen to 1%, 1.6%, 2% and 2.4%, respectively. Towards the other end of the spectrum is Houston, which still

has a relatively 'fat' yield of 6%. Tables 2.3 and 2.4 show the net rental yields for states and cities.

Of course, interest rates are low relative to the past, which should push rental yields structurally lower. So what we did on tables 2.5 and 2.6 is look at rental yields less the risk-free interest rate (using the 10-year Treasury note yield). Where are the 'excess rental yields' today and how do they compare to their 20- and 30-year averages?

On this basis, Maine, DC, Vermont, Montana, Florida, Massachusetts, Rhode Island, Wyoming, Arizona and California make the top 10 'expensive' list. Texas and North Carolina are cheapest.

The bubble-zone excess yield is just 0.2% compared to the 30-year average of 1.3%. Meanwhile, the non-bubble zone excess yield is exactly at its 30-year average, at 2.8%. So the decline in net rental yields in the non-bubble zone appears justified by lower real interest rates generally. But the decline in the bubble zone cannot be totally explained by falling rates, suggesting something else, such as a bubble, is taking yields further down into more dangerous depths.[2]

The consequences are large should investors ever again demand a higher excess rental yield, say, due to the demand for higher-income generating assets that reflect the preferences of an ageing society. Take Florida, where the excess rental yield is 2.1% compared to a 30-year average of 4.4%. All things the same, this would involve a 52% decline in home prices. If Florida has enjoyed an international 'glamour re-rating', so that excess yields only have to rise to 3% instead, this would still involve a painful 30% bust in home prices.

## Table guides

The following eight tables (four tables for states and four for cities) show:

- Real price growth ranked by the five-year annual average growth rate, from highest to lowest. One can compare these against the 20- and 30-year averages, and see how the five-year performance has deviated from these longer-run averages as a potential guide to how far off track price momentum has gone.
- Net rental yields as at 2005Q3, the 20- and 30-year averages and 2005Q3's deviation from those long-run averages. We rank them from high to low by the deviation from the 30-year average.
- The 'excess' yield (net rental yield less the real 10-year Treasury note yield). Again, we rank them by the 2005Q3 deviation from the 30-year average.
- Real total returns (real price growth plus net rental yield), ranked by 2005Q3's total return over 2004.

[2] Note that the excess yield is one side of a rearrangement of the Gordon growth model, where the excess yield (rental yield less real risk free rate) is equal to the risk premium less expected future growth (RY – real RFR = RP – G). So the decline in the excess yield must have occurred because the risk premium declined, expected growth has risen, or both. These issues are investigated later in sections 7 and 8.

HSBC

# 2.1. Real price growth: states

| Rank | Area | 5yr average | 20yr average | Deviation from 20yr average (ppt) | 30yr average | Deviation from 30yr average (ppt) |
|---|---|---|---|---|---|---|
| | United States (median) | 6.9 | 2.8 | 4.1 | 2.2 | 4.7 |
| | United States (average)* | 8.0 | 3.1 | 4.9 | 2.5 | 5.4 |
| | | | | | | |
| | Total Bubble Zone | 11.0 | 4.2 | 6.9 | 3.7 | 7.4 |
| | Eastern Bubble Zone | 10.2 | 3.7 | 6.5 | 3.1 | 7.1 |
| | Western Bubble Zone | 11.9 | 4.8 | 7.1 | 4.4 | 7.5 |
| | Non-Bubble Zone | 3.7 | 1.7 | 2.0 | 1.2 | 2.5 |
| | | | | | | |
| **1** | District of Columbia | **14.2** | 5.5 | 8.6 | 4.6 | 9.6 |
| **2** | California | **13.7** | 5.3 | 8.4 | 5.1 | 8.5 |
| **3** | Rhode Island | **12.6** | 5.0 | 7.6 | 3.8 | 8.7 |
| **4** | Nevada | **12.3** | 3.4 | 8.9 | 2.9 | 9.4 |
| **5** | Hawaii | **12.1** | 4.6 | 7.4 | 3.7 | 8.4 |
| **6** | Florida | **11.7** | 3.2 | 8.5 | 2.0 | 9.7 |
| **7** | Maryland | **11.2** | 3.9 | 7.3 | 2.9 | 8.3 |
| **8** | New Jersey | **10.3** | 3.9 | 6.4 | 3.6 | 6.7 |
| **9** | Virginia | **9.6** | 3.3 | 6.3 | 2.3 | 7.3 |
| **10** | New York | **9.3** | 3.4 | 5.8 | 3.3 | 6.0 |
| **11** | New Hampshire | **9.1** | 3.1 | 6.0 | 3.3 | 5.8 |
| **12** | Arizona | **9.0** | 2.5 | 6.4 | 2.2 | 6.7 |
| **13** | Massachusetts | **8.9** | 3.8 | 5.1 | 4.4 | 4.5 |
| **14** | Maine | **8.6** | 3.3 | 5.3 | 3.0 | 5.6 |
| **15** | Delaware | **8.4** | 3.3 | 5.1 | 2.2 | 6.2 |
| **16** | Connecticut | **8.1** | 2.9 | 5.3 | 3.1 | 5.1 |
| **17** | Vermont | **7.8** | 3.2 | 4.6 | 2.0 | 5.8 |
| **18** | Minnesota | **6.9** | 3.1 | 3.8 | 2.4 | 4.5 |
| **19** | Pennsylvania | **6.5** | 2.8 | 3.6 | 1.7 | 4.8 |
| **20** | Montana | **5.9** | 2.5 | 3.4 | 2.0 | 3.8 |
| **21** | Oregon | **5.8** | 4.2 | 1.6 | 2.9 | 2.9 |
| **22** | Wyoming | **5.8** | 1.8 | 4.0 | 1.4 | 4.3 |
| **23** | Washington | **5.7** | 3.9 | 1.8 | 3.5 | 2.2 |
| **24** | Alaska | **5.3** | 0.3 | 5.0 | 0.8 | 4.5 |
| **25** | Illinois | **5.0** | 3.0 | 2.0 | 1.8 | 3.1 |
| **26** | Idaho | **4.6** | 2.0 | 2.6 | 1.2 | 3.4 |
| **27** | New Mexico | **4.4** | 1.3 | 3.1 | 1.5 | 2.9 |
| **28** | Wisconsin | **4.4** | 2.7 | 1.6 | 1.5 | 2.8 |
| **29** | North Dakota | **4.3** | 0.9 | 3.4 | 0.6 | 3.7 |
| **30** | Missouri | **4.0** | 1.6 | 2.4 | 1.0 | 3.0 |
| **31** | West Virginia | **4.0** | 1.3 | 2.6 | 0.1 | 3.8 |
| **32** | South Dakota | **3.6** | 1.8 | 1.7 | 0.9 | 2.7 |
| **33** | Colorado | **3.4** | 2.6 | 0.8 | 2.6 | 0.8 |
| **34** | Georgia | **3.4** | 1.6 | 1.8 | 1.0 | 2.4 |
| **35** | Louisiana | **3.4** | 0.6 | 2.8 | 0.8 | 2.6 |
| **36** | Arkansas | **3.3** | 0.8 | 2.6 | 0.7 | 2.7 |
| **37** | South Carolina | **3.3** | 1.7 | 1.7 | 1.1 | 2.2 |
| **38** | Alabama | **2.9** | 1.3 | 1.6 | 0.6 | 2.3 |
| **39** | Oklahoma | **2.8** | -0.2 | 3.0 | 0.4 | 2.4 |
| **40** | Kansas | **2.8** | 1.1 | 1.6 | 0.6 | 2.2 |
| **41** | Kentucky | **2.7** | 1.8 | 0.8 | 0.9 | 1.8 |
| **42** | Iowa | **2.7** | 1.7 | 1.0 | 0.8 | 1.9 |
| **43** | Michigan | **2.6** | 3.3 | -0.7 | 1.9 | 0.8 |
| **44** | North Carolina | **2.6** | 1.5 | 1.1 | 1.1 | 1.5 |
| **45** | Tennessee | **2.6** | 1.4 | 1.2 | 0.9 | 1.7 |
| **46** | Texas | **2.4** | -0.3 | 2.6 | 0.3 | 2.0 |
| **47** | Ohio | **2.3** | 2.0 | 0.3 | 1.1 | 1.2 |
| **48** | Nebraska | **2.3** | 1.4 | 0.9 | 0.8 | 1.5 |
| **49** | Mississippi | **2.2** | 0.5 | 1.7 | 0.0 | 2.2 |
| **50** | Utah | **2.1** | 2.1 | -0.1 | 1.8 | 0.3 |
| **51** | Indiana | **1.9** | 1.5 | 0.3 | 0.9 | 1.0 |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices.

HSBC

# 2.2. Real price growth: cities

| Rank | Area | 5yr average | 20yr average | Deviation from 20yr average (ppt) | 30yr average | Deviation from 30yr average (ppt) |
|---|---|---|---|---|---|---|
| 1 | Riverside-San Bernardino-Ontario, CA | **15.5** | 4.4 | 11.1 | 4.1 | 11.4 |
| 2 | Sacramento-Arden-Arcade-Roseville, CA | **14.7** | 5.1 | 9.6 | 4.3 | 10.4 |
| 3 | San Diego-Carlsbad-San Marcos, CA | **14.5** | 5.6 | 8.9 | 4.9 | 9.6 |
| 4 | Los Angeles-Long Beach-Glendale, CA (MSAD) | **14.4** | 5.1 | 9.3 | 5.1 | 9.3 |
| 5 | Santa Ana-Anaheim-Irvine, CA (MSAD) | **14.2** | 5.2 | 8.9 | 5.0 | 9.2 |
| 6 | Palm Bay-Melbourne-Titusville, FL | **14.1** | 2.9 | 11.2 | 2.2 | 11.9 |
| 7 | Miami-Miami Beach-Kendall, FL (MSAD) | **13.6** | 4.3 | 9.3 | 3.2 | 10.4 |
| 8 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | **12.9** | 4.4 | 8.5 | 3.3 | 9.6 |
| 9 | Las Vegas-Paradise, NV | **12.6** | 3.4 | 9.2 | 2.3 | 10.3 |
| 10 | Providence-New Bedford-Fall River, RI-MA | **12.0** | 4.8 | 7.2 | 4.0 | 8.0 |
| 11 | Nassau-Suffolk, NY (MSAD) | **11.7** | 4.4 | 7.2 | 4.6 | 7.1 |
| 12 | Edison, NJ (MSAD) | **11.2** | 4.3 | 7.0 | 4.0 | 7.3 |
| 13 | Oakland-Fremont-Hayward, CA (MSAD) | **11.2** | 5.5 | 5.7 | 5.3 | 6.0 |
| 14 | Honolulu, HI | **11.0** | 4.4 | 6.6 | 4.0 | 7.0 |
| 15 | Baltimore-Towson, MD | **10.8** | 3.8 | 7.1 | 2.8 | 8.1 |
| 16 | Tampa-St. Petersburg-Clearwater, FL | **10.5** | 2.9 | 7.6 | 2.4 | 8.1 |
| 17 | New York-Wayne-White Plains, NY-NJ (MSAD) | **10.3** | 4.2 | 6.1 | 4.6 | 5.6 |
| 18 | Virginia Beach-Norfolk-Newport News, VA-NC | **10.2** | 2.6 | 7.6 | 2.3 | 7.9 |
| 19 | Orlando, FL | **9.8** | 2.5 | 7.4 | 2.3 | 7.6 |
| 20 | Newark-Union, NJ-PA (MSAD) | **9.6** | 3.8 | 5.8 | 4.1 | 5.4 |
| 21 | Boston-Quincy, MA (MSAD) | **9.4** | 4.2 | 5.2 | 5.3 | 4.1 |
| 22 | Phoenix-Mesa-Scottdale, AZ | **9.1** | 2.5 | 6.6 | 2.5 | 6.6 |
| 23 | Philadelphia, PA (MSAD) | **8.9** | 3.5 | 5.4 | 2.5 | 6.4 |
| 24 | New Haven-Milford, CT | **8.8** | 3.0 | 5.8 | 3.0 | 5.9 |
| 25 | Bridgeport-Stamford-Norwalk, CT | **8.6** | 3.3 | 5.3 | 3.8 | 4.8 |
| 26 | Tucson, AZ | **8.1** | 2.6 | 5.5 | 2.4 | 5.8 |
| 27 | San Francisco-San Mateo-Redwood City, CA (MSAD) | **7.9** | 5.8 | 2.1 | 5.5 | 2.4 |
| 28 | Minneapolis-St. Paul-Bloomington, MN-WI | **7.2** | 3.2 | 4.0 | 2.5 | 4.7 |
| 29 | Hartford-West Hartford-East Hartford, CT | **7.1** | 2.5 | 4.6 | 2.3 | 4.8 |
| 30 | Charleston-North Charleston, SC | **6.3** | 3.1 | 3.2 | 2.6 | 3.7 |
| 31 | Chicago-Naperville-Joliet, IL (MSAD) | **6.0** | 3.5 | 2.5 | 2.4 | 3.6 |
| 32 | Seattle-Bellevue-Everett, WA (MSAD) | **5.6** | 4.5 | 1.1 | 4.3 | 1.3 |
| 33 | Portland-Vancouver-Beaverton, OR-WA | **5.4** | 4.1 | 1.3 | 2.8 | 2.6 |
| 34 | Milwaukee-Waukesha-West Allis, WI | **5.2** | 3.0 | 2.3 | 1.3 | 3.9 |
| 35 | St. Louis, MO-IL | **4.7** | 1.8 | 3.0 | 1.6 | 3.2 |
| 36 | New Orleans-Metairie-Kenner, LA | **4.5** | 1.1 | 3.4 | 0.8 | 3.7 |
| 37 | Albuquerque, NM | **3.9** | 1.2 | 2.7 | 1.2 | 2.7 |
| 38 | Colorado Springs, CO | **3.7** | 1.9 | 1.8 | 1.5 | 2.2 |
| 39 | Pittsburgh, PA | **3.6** | 1.9 | 1.7 | 0.9 | 2.7 |
| 40 | Kansas City, MO-KS | **3.4** | 1.5 | 1.9 | 0.9 | 2.4 |
| 41 | Buffalo-Niagara Falls, NY | **3.3** | 1.7 | 1.7 | 1.1 | 2.3 |
| 42 | San Antonio, TX | **3.2** | -0.4 | 3.6 | -0.3 | 3.5 |
| 43 | Atlanta-Sandy Springs-Marietta, GA | **3.2** | 1.6 | 1.5 | 1.1 | 2.1 |
| 44 | Denver-Aurora, CO | **3.1** | 2.5 | 0.6 | 2.8 | 0.4 |
| 45 | Houston-Baytown-Sugar Land, TX | **2.8** | 0.2 | 2.6 | -0.1 | 2.8 |
| 46 | Nashville-Davidson-Murfreesboro, TN | **2.6** | 1.7 | 0.9 | 1.0 | 1.5 |
| 47 | Columbus, OH | **2.5** | 2.0 | 0.6 | 1.1 | 1.4 |
| 48 | Detroit-Livonia-Dearborn, MI (MSAD) | **2.4** | 3.8 | -1.4 | 2.3 | 0.2 |
| 49 | Cincinnati-Middletown, OH-KY-IN | **2.4** | 1.9 | 0.5 | 1.0 | 1.4 |
| 50 | Omaha-Council Bluffs, NE-IA | **2.4** | 1.4 | 1.1 | 0.7 | 1.7 |
| 51 | Salt Lake City, UT | **2.2** | 2.4 | -0.2 | 1.7 | 0.5 |
| 52 | Cleveland-Elyria-Mentor, OH | **2.2** | 2.0 | 0.2 | 1.2 | 1.0 |
| 53 | Dallas-Plano-Irving, TX (MSAD) | **2.0** | -0.6 | 2.6 | 0.8 | 1.3 |
| 54 | Cedar Rapids, IA | **2.0** | 1.7 | 0.2 | 1.4 | 0.6 |
| 55 | Indianapolis, IN | **1.8** | 1.4 | 0.3 | 1.0 | 0.8 |
| 56 | Austin-Round Rock, TX | **1.7** | 0.3 | 1.4 | 1.4 | 0.3 |
| 57 | Charlotte-Gastonia-Concord, NC-SC | **1.6** | 1.5 | 0.1 | 1.2 | 0.4 |
| 58 | Memphis, TN-MS-AR | **1.6** | 0.8 | 0.7 | 0.6 | 1.0 |
| 59 | Greensboro-High Point, NC | **1.5** | 1.0 | 0.5 | 0.6 | 0.9 |

Source: HSBC

HSBC

# 2.3. Net rental yield: states

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| | United States (median) | 4.5 | 6.6 | -33 | 6.9 | -35 |
| | United States (average)* | 3.3 | 5.4 | -39 | 5.8 | -42 |
| | | | | | | |
| | Total Bubble Zone | 2.2 | 4.4 | -50 | 4.9 | -55 |
| | Eastern Bubble Zone | 2.8 | 5.0 | -44 | 5.6 | -50 |
| | Western Bubble Zone | 1.6 | 3.7 | -57 | 4.1 | -62 |
| | Non-Bubble Zone | 4.8 | 6.3 | -24 | 6.4 | -25 |
| | | | | | | |
| **1** | California | 2.1 | 4.8 | -56 | 5.4 | **-61** |
| **2** | Hawaii | 1.6 | 3.2 | -50 | 3.6 | **-56** |
| **3** | District of Columbia | 3.4 | 7.3 | -53 | 7.4 | **-54** |
| **4** | Oregon | 3.1 | 6.0 | -49 | 6.2 | **-51** |
| **5** | Maryland | 3.0 | 5.6 | -46 | 6.1 | **-51** |
| **6** | Rhode Island | 3.3 | 6.0 | -45 | 6.7 | **-50** |
| **7** | Massachusetts | 3.9 | 6.2 | -38 | 7.7 | **-50** |
| **8** | Nevada | 3.1 | 6.3 | -51 | 6.2 | **-50** |
| **9** | Washington | 3.1 | 5.5 | -43 | 6.2 | **-49** |
| **10** | Florida | 4.1 | 7.8 | -48 | 7.9 | **-48** |
| **11** | Montana | 4.2 | 7.9 | -46 | 8.2 | **-48** |
| **12** | New Jersey | 3.5 | 6.1 | -42 | 6.7 | **-47** |
| **13** | Arizona | 3.8 | 7.0 | -46 | 7.1 | **-47** |
| **14** | Virginia | 3.3 | 5.6 | -40 | 6.2 | **-46** |
| **15** | Maine | 5.5 | 8.6 | -36 | 9.8 | **-44** |
| **16** | Delaware | 3.8 | 6.1 | -37 | 6.7 | **-43** |
| **17** | Vermont | 5.3 | 8.4 | -37 | 9.3 | **-43** |
| **18** | New York | 4.4 | 6.4 | -32 | 7.4 | **-41** |
| **19** | Wyoming | 4.9 | 8.7 | -43 | 8.2 | **-40** |
| **20** | Illinois | 5.1 | 7.7 | -33 | 8.3 | **-38** |
| **21** | New Hampshire | 5.0 | 7.4 | -33 | 8.0 | **-38** |
| **22** | Colorado | 4.1 | 6.2 | -33 | 6.6 | **-37** |
| **23** | Minnesota | 5.2 | 8.0 | -35 | 8.3 | **-37** |
| **24** | Connecticut | 3.8 | 5.5 | -32 | 6.0 | **-37** |
| **25** | Wisconsin | 4.9 | 7.3 | -32 | 7.5 | **-35** |
| **26** | Utah | 3.9 | 5.6 | -30 | 5.8 | **-34** |
| **27** | Michigan | 6.0 | 8.3 | -28 | 8.9 | **-33** |
| **28** | Pennsylvania | 5.9 | 8.1 | -27 | 8.7 | **-31** |
| **29** | Alaska | 4.9 | 6.8 | -29 | 7.0 | **-30** |
| **30** | Kentucky | 6.1 | 8.1 | -25 | 8.5 | **-29** |
| **31** | North Dakota | 6.5 | 9.4 | -31 | 9.0 | **-28** |
| **32** | Idaho | 4.8 | 6.6 | -28 | 6.6 | **-28** |
| **33** | South Dakota | 7.2 | 9.7 | -26 | 9.9 | **-27** |
| **34** | New Mexico | 5.1 | 7.0 | -27 | 6.7 | **-24** |
| **35** | West Virginia | 6.4 | 8.4 | -24 | 8.4 | **-24** |
| **36** | Iowa | 7.4 | 9.8 | -25 | 9.6 | **-23** |
| **37** | South Carolina | 5.9 | 7.4 | -21 | 7.6 | **-23** |
| **38** | Tennessee | 6.3 | 7.7 | -19 | 8.0 | **-21** |
| **39** | Georgia | 6.2 | 7.7 | -20 | 7.7 | **-20** |
| **40** | Missouri | 6.8 | 8.2 | -18 | 8.4 | **-19** |
| **41** | Kansas | 7.0 | 9.2 | -24 | 8.7 | **-19** |
| **42** | Alabama | 6.1 | 7.5 | -19 | 7.6 | **-19** |
| **43** | Ohio | 6.0 | 7.2 | -17 | 7.3 | **-18** |
| **44** | Oklahoma | 8.1 | 10.2 | -21 | 9.7 | **-17** |
| **45** | Louisiana | 6.6 | 8.5 | -22 | 7.9 | **-16** |
| **46** | Nebraska | 7.4 | 8.9 | -18 | 8.8 | **-16** |
| **47** | Arkansas | 7.2 | 9.0 | -19 | 8.5 | **-15** |
| **48** | North Carolina | 6.0 | 6.8 | -11 | 7.1 | **-15** |
| **49** | Indiana | 7.1 | 8.1 | -13 | 8.1 | **-13** |
| **50** | Mississippi | 8.7 | 9.9 | -12 | 9.8 | **-11** |
| **51** | Texas | 8.7 | 9.6 | -9 | 8.7 | **0** |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices.

HSBC

# 2.4. Net rental yield: cities

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| 1 | Oakland-Fremont-Hayward, CA (MSAD) | 0.9 | 2.6 | -64 | 2.9 | -68 |
| 2 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 1.0 | 2.9 | -66 | 3.1 | -68 |
| 3 | Riverside-San Bernardino-Ontario, CA | 1.6 | 4.4 | -64 | 4.8 | -67 |
| 4 | San Diego-Carlsbad-San Marcos, CA | 1.1 | 2.9 | -61 | 3.3 | -65 |
| 5 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 1.6 | 3.7 | -57 | 4.4 | -63 |
| 6 | Miami-Miami Beach-Kendall, FL (MSAD) | 2.2 | 5.5 | -61 | 5.9 | -63 |
| 7 | Nassau-Suffolk, NY (MSAD) | 2.4 | 5.2 | -53 | 6.4 | -62 |
| 8 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 1.6 | 3.3 | -53 | 3.8 | -58 |
| 9 | Sacramento-Arden-Arcade-Roseville, CA | 2.0 | 4.3 | -53 | 4.7 | -57 |
| 10 | Seattle-Bellevue-Everett, WA (MSAD) | 2.3 | 4.5 | -48 | 5.3 | -57 |
| 11 | New York-Wayne-White Plains, NY-NJ (MSAD) | 1.8 | 3.3 | -45 | 4.1 | -56 |
| 12 | Newark-Union, NJ-PA (MSAD) | 1.9 | 3.6 | -49 | 4.1 | -55 |
| 13 | Palm Bay-Melbourne-Titusville, FL | 3.4 | 7.4 | -54 | 7.4 | -54 |
| 14 | Honolulu, HI | 1.4 | 2.7 | -48 | 3.0 | -54 |
| 15 | Providence-New Bedford-Fall River, RI-MA | 2.6 | 4.9 | -47 | 5.5 | -53 |
| 16 | Bridgeport-Stamford-Norwalk, CT | 1.4 | 2.5 | -46 | 2.8 | -52 |
| 17 | Portland-Vancouver-Beaverton, OR-WA | 2.9 | 5.5 | -47 | 5.8 | -50 |
| 18 | Boston-Quincy, MA (MSAD) | 3.1 | 5.2 | -41 | 6.1 | -50 |
| 19 | Tucson, AZ | 3.0 | 5.8 | -48 | 5.9 | -49 |
| 20 | Las Vegas-Paradise, NV | 2.5 | 5.1 | -51 | 4.9 | -49 |
| 21 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 2.5 | 4.8 | -48 | 4.8 | -48 |
| 22 | Baltimore-Towson, MD | 3.4 | 6.1 | -44 | 6.6 | -48 |
| 23 | Phoenix-Mesa-Scottdale, AZ | 3.6 | 6.8 | -48 | 6.8 | -48 |
| 24 | Chicago-Naperville-Joliet, IL (MSAD) | 3.4 | 5.6 | -40 | 6.4 | -47 |
| 25 | Charleston-North Charleston, SC | 3.0 | 5.3 | -43 | 5.7 | -46 |
| 26 | Edison, NJ (MSAD) | 3.3 | 5.6 | -40 | 6.1 | -45 |
| 27 | Virginia Beach-Norfolk-Newport News, VA-NC | 4.0 | 6.6 | -39 | 7.0 | -43 |
| 28 | Tampa-St. Petersburg-Clearwater, FL | 4.3 | 7.4 | -42 | 7.4 | -42 |
| 29 | New Haven-Milford, CT | 3.3 | 5.3 | -37 | 5.6 | -40 |
| 30 | Orlando, FL | 4.1 | 6.9 | -40 | 6.9 | -40 |
| 31 | Denver-Aurora, CO | 3.6 | 5.5 | -34 | 6.0 | -39 |
| 32 | Minneapolis-St. Paul-Bloomington, MN-WI | 4.1 | 6.5 | -36 | 6.8 | -39 |
| 33 | Milwaukee-Waukesha-West Allis, WI | 3.3 | 5.2 | -36 | 5.4 | -39 |
| 34 | Philadelphia, PA (MSAD) | 4.6 | 7.0 | -34 | 7.5 | -39 |
| 35 | Salt Lake City, UT | 4.1 | 6.1 | -33 | 6.5 | -37 |
| 36 | Detroit-Livonia-Dearborn, MI (MSAD) | 5.5 | 7.7 | -29 | 8.4 | -34 |
| 37 | Hartford-West Hartford-East Hartford, CT | 3.6 | 4.8 | -25 | 5.1 | -29 |
| 38 | Nashville-Davidson-Murfreesboro, TN | 4.8 | 6.4 | -26 | 6.7 | -29 |
| 39 | Colorado Springs, CO | 4.0 | 5.3 | -24 | 5.3 | -23 |
| 40 | Albuquerque, NM | 4.5 | 5.9 | -23 | 5.9 | -23 |
| 41 | Cedar Rapids, IA | 5.2 | 6.6 | -21 | 6.7 | -23 |
| 42 | Kansas City, MO-KS | 4.8 | 6.1 | -22 | 6.0 | -21 |
| 43 | St. Louis, MO-IL | 6.1 | 7.4 | -18 | 7.7 | -20 |
| 44 | Columbus, OH | 4.9 | 6.0 | -18 | 6.1 | -19 |
| 45 | Atlanta-Sandy Springs-Marietta, GA | 5.7 | 7.2 | -20 | 7.1 | -19 |
| 46 | Buffalo-Niagara Falls, NY | 7.7 | 8.6 | -10 | 9.4 | -19 |
| 47 | Pittsburgh, PA | 6.6 | 7.7 | -14 | 8.2 | -19 |
| 48 | New Orleans-Metairie-Kenner, LA | 5.4 | 6.9 | -22 | 6.5 | -17 |
| 49 | Omaha-Council Bluffs, NE-IA | 5.6 | 6.8 | -18 | 6.7 | -16 |
| 50 | Cleveland-Elyria-Mentor, OH | 5.6 | 6.6 | -15 | 6.7 | -16 |
| 51 | Cincinnati-Middletown, OH-KY-IN | 5.0 | 5.9 | -15 | 5.9 | -14 |
| 52 | Indianapolis, IN | 6.4 | 7.1 | -9 | 7.1 | -9 |
| 53 | Austin-Round Rock, TX | 6.5 | 7.3 | -11 | 7.1 | -9 |
| 54 | Charlotte-Gastonia-Concord, NC-SC | 4.8 | 4.9 | -2 | 5.2 | -8 |
| 55 | Greensboro-High Point, NC | 5.0 | 5.3 | -5 | 5.4 | -7 |
| 56 | Memphis, TN-MS-AR | 5.2 | 5.5 | -5 | 5.5 | -5 |
| 57 | San Antonio, TX | 6.2 | 6.9 | -10 | 6.4 | -3 |
| 58 | Houston-Baytown-Sugar Land, TX | 5.9 | 6.8 | -14 | 6.1 | -3 |
| 59 | Dallas-Plano-Irving, TX (MSAD) | 7.2 | 7.2 | 0 | 6.5 | 10 |

Source: HSBC

HSBC

# 2.5. Net rental yield less real risk-free interest rate: states

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (ppt) | 30yr average | Deviation from 30yr average (ppt) |
|---|---|---|---|---|---|---|
| | United States (median) | 2.5 | 3.4 | -1.0 | 3.3 | -0.9 |
| | United States (average)* | 1.3 | 2.3 | -0.9 | 2.2 | -0.9 |
| | | | | | | |
| | Total Bubble Zone | 0.2 | 1.2 | -1.0 | 1.3 | -1.1 |
| | Eastern Bubble Zone | 0.8 | 1.8 | -1.0 | 2.0 | -1.2 |
| | Western Bubble Zone | -0.4 | 0.5 | -0.9 | 0.6 | -1.0 |
| | Non-Bubble Zone | 2.8 | 3.1 | -0.3 | 2.8 | 0.0 |
| | | | | | | |
| **1** | Maine | 3.5 | 5.4 | -1.9 | 6.2 | **-2.7** |
| **2** | District of Columbia | 1.4 | 4.1 | -2.7 | 3.9 | **-2.5** |
| **3** | Vermont | 3.3 | 5.2 | -1.9 | 5.7 | **-2.4** |
| **4** | Montana | 2.2 | 4.7 | -2.4 | 4.6 | **-2.4** |
| **5** | Florida | 2.1 | 4.6 | -2.5 | 4.4 | **-2.3** |
| **6** | Massachusetts | 1.9 | 3.0 | -1.2 | 4.1 | **-2.2** |
| **7** | Rhode Island | 1.3 | 2.9 | -1.5 | 3.1 | **-1.8** |
| **8** | Wyoming | 2.9 | 5.5 | -2.5 | 4.7 | **-1.8** |
| **9** | Arizona | 1.8 | 3.8 | -2.1 | 3.5 | **-1.8** |
| **10** | California | 0.1 | 1.6 | -1.5 | 1.8 | **-1.7** |
| **11** | Illinois | 3.1 | 4.5 | -1.4 | 4.8 | **-1.7** |
| **12** | New Jersey | 1.5 | 2.9 | -1.4 | 3.2 | **-1.6** |
| **13** | Oregon | 1.1 | 2.8 | -1.8 | 2.7 | **-1.6** |
| **14** | Maryland | 1.0 | 2.4 | -1.4 | 2.5 | **-1.5** |
| **15** | Minnesota | 3.2 | 4.8 | -1.6 | 4.7 | **-1.5** |
| **16** | New York | 2.4 | 3.3 | -0.9 | 3.9 | **-1.5** |
| **17** | New Hampshire | 3.0 | 4.2 | -1.2 | 4.5 | **-1.5** |
| **18** | Nevada | 1.1 | 3.2 | -2.1 | 2.6 | **-1.5** |
| **19** | Washington | 1.1 | 2.3 | -1.2 | 2.6 | **-1.5** |
| **20** | Michigan | 4.0 | 5.1 | -1.1 | 5.3 | **-1.4** |
| **21** | Virginia | 1.3 | 2.4 | -1.0 | 2.7 | **-1.3** |
| **22** | Delaware | 1.8 | 2.9 | -1.1 | 3.2 | **-1.3** |
| **23** | Pennsylvania | 3.9 | 4.9 | -1.0 | 5.1 | **-1.2** |
| **24** | South Dakota | 5.2 | 6.5 | -1.3 | 6.3 | **-1.1** |
| **25** | Wisconsin | 2.9 | 4.1 | -1.2 | 4.0 | **-1.1** |
| **26** | North Dakota | 4.5 | 6.2 | -1.8 | 5.5 | **-1.0** |
| **27** | Colorado | 2.1 | 3.0 | -0.9 | 3.0 | **-0.9** |
| **28** | Kentucky | 4.1 | 4.9 | -0.8 | 5.0 | **-0.9** |
| **29** | Iowa | 5.4 | 6.7 | -1.2 | 6.1 | **-0.7** |
| **30** | Connecticut | 1.8 | 2.3 | -0.6 | 2.4 | **-0.6** |
| **31** | Alaska | 2.9 | 3.7 | -0.8 | 3.5 | **-0.6** |
| **32** | Hawaii | -0.4 | 0.0 | -0.4 | 0.0 | **-0.5** |
| **33** | West Virginia | 4.4 | 5.2 | -0.9 | 4.8 | **-0.4** |
| **34** | Utah | 1.9 | 2.4 | -0.5 | 2.3 | **-0.4** |
| **35** | Idaho | 2.8 | 3.5 | -0.7 | 3.0 | **-0.3** |
| **36** | South Carolina | 3.9 | 4.2 | -0.3 | 4.0 | **-0.2** |
| **37** | Tennessee | 4.3 | 4.5 | -0.2 | 4.4 | **-0.1** |
| **38** | Kansas | 5.0 | 6.1 | -1.1 | 5.1 | **-0.1** |
| **39** | Oklahoma | 6.1 | 7.0 | -1.0 | 6.1 | **-0.1** |
| **40** | Missouri | 4.8 | 5.1 | -0.3 | 4.9 | **-0.1** |
| **41** | New Mexico | 3.1 | 3.8 | -0.7 | 3.2 | **-0.1** |
| **42** | Georgia | 4.2 | 4.5 | -0.4 | 4.2 | **0.0** |
| **43** | Alabama | 4.1 | 4.3 | -0.2 | 4.0 | **0.1** |
| **44** | Nebraska | 5.4 | 5.8 | -0.4 | 5.2 | **0.1** |
| **45** | Ohio | 4.0 | 4.0 | -0.1 | 3.8 | **0.2** |
| **46** | Arkansas | 5.2 | 5.8 | -0.5 | 5.0 | **0.2** |
| **47** | Louisiana | 4.6 | 5.3 | -0.7 | 4.3 | **0.3** |
| **48** | Indiana | 5.1 | 4.9 | 0.1 | 4.6 | **0.5** |
| **49** | Mississippi | 6.7 | 6.7 | 0.0 | 6.2 | **0.5** |
| **50** | North Carolina | 4.0 | 3.6 | 0.5 | 3.5 | **0.5** |
| **51** | Texas | 6.7 | 6.4 | 0.3 | 5.2 | **1.6** |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices; risk free rate is the 10-year Treasury note yield.

HSBC

# 2.6. Net rental yield less real risk-free interest rate: cities

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (ppt) | 30yr average | Deviation from 30yr average (ppt) |
|---|---|---|---|---|---|---|
| **1** | Nassau-Suffolk, NY (MSAD) | 0.4 | 2.0 | -1.6 | 2.9 | **-2.4** |
| **2** | Palm Bay-Melbourne-Titusville, FL | 1.4 | 4.2 | -2.8 | 3.6 | **-2.2** |
| **3** | Miami-Miami Beach-Kendall, FL (MSAD) | 0.2 | 2.3 | -2.2 | 2.3 | **-2.1** |
| **4** | Phoenix-Mesa-Scottdale, AZ | 1.6 | 3.7 | -2.1 | 3.2 | **-1.7** |
| **5** | Riverside-San Bernardino-Ontario, CA | -0.4 | 1.2 | -1.6 | 1.2 | **-1.7** |
| **6** | Baltimore-Towson, MD | 1.4 | 2.9 | -1.5 | 3.0 | **-1.6** |
| **7** | Tampa-St. Petersburg-Clearwater, FL | 2.3 | 4.2 | -1.9 | 3.9 | **-1.6** |
| **8** | Seattle-Bellevue-Everett, WA (MSAD) | 0.3 | 1.3 | -1.0 | 1.8 | **-1.5** |
| **9** | Virginia Beach-Norfolk-Newport News, VA-NC | 2.0 | 3.4 | -1.4 | 3.4 | **-1.4** |
| **10** | Chicago-Naperville-Joliet, IL (MSAD) | 1.4 | 2.4 | -1.1 | 2.8 | **-1.4** |
| **11** | Boston-Quincy, MA (MSAD) | 1.1 | 2.0 | -1.0 | 2.4 | **-1.4** |
| **12** | Portland-Vancouver-Beaverton, OR-WA | 0.9 | 2.3 | -1.4 | 2.2 | **-1.3** |
| **13** | Philadelphia, PA (MSAD) | 2.6 | 3.8 | -1.2 | 4.0 | **-1.3** |
| **14** | Providence-New Bedford-Fall River, RI-MA | 0.6 | 1.7 | -1.1 | 1.9 | **-1.3** |
| **15** | Detroit-Livonia-Dearborn, MI (MSAD) | 3.5 | 4.5 | -1.0 | 4.8 | **-1.3** |
| **16** | Tucson, AZ | 1.0 | 2.6 | -1.6 | 2.3 | **-1.3** |
| **17** | Los Angeles-Long Beach-Glendale, CA (MSAD) | -0.4 | 0.5 | -0.9 | 0.8 | **-1.2** |
| **18** | Edison, NJ (MSAD) | 1.3 | 2.4 | -1.1 | 2.5 | **-1.2** |
| **19** | Sacramento-Arden-Arcade-Roseville, CA | 0.0 | 1.1 | -1.1 | 1.2 | **-1.1** |
| **20** | Minneapolis-St. Paul-Bloomington, MN-WI | 2.1 | 3.3 | -1.2 | 3.2 | **-1.1** |
| **21** | Orlando, FL | 2.1 | 3.7 | -1.6 | 3.2 | **-1.0** |
| **22** | Charleston-North Charleston, SC | 1.0 | 2.2 | -1.1 | 1.9 | **-0.8** |
| **23** | Salt Lake City, UT | 2.1 | 3.0 | -0.9 | 2.9 | **-0.8** |
| **24** | Denver-Aurora, CO | 1.6 | 2.3 | -0.7 | 2.4 | **-0.8** |
| **25** | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 0.5 | 1.6 | -1.1 | 1.3 | **-0.8** |
| **26** | New York-Wayne-White Plains, NY-NJ (MSAD) | -0.2 | 0.1 | -0.3 | 0.6 | **-0.7** |
| **27** | Newark-Union, NJ-PA (MSAD) | -0.1 | 0.5 | -0.6 | 0.6 | **-0.7** |
| **28** | Las Vegas-Paradise, NV | 0.5 | 1.9 | -1.4 | 1.1 | **-0.6** |
| **29** | San Francisco-San Mateo-Redwood City, CA (MSAD) | -0.4 | 0.1 | -0.6 | 0.2 | **-0.6** |
| **30** | San Diego-Carlsbad-San Marcos, CA | -0.9 | -0.3 | -0.6 | -0.3 | **-0.6** |
| **31** | Santa Ana-Anaheim-Irvine, CA (MSAD) | -1.0 | -0.3 | -0.7 | -0.5 | **-0.6** |
| **32** | New Haven-Milford, CT | 1.3 | 2.1 | -0.8 | 1.9 | **-0.5** |
| **33** | Milwaukee-Waukesha-West Allis, WI | 1.3 | 2.0 | -0.7 | 1.8 | **-0.5** |
| **34** | Oakland-Fremont-Hayward, CA (MSAD) | -1.1 | -0.6 | -0.5 | -0.7 | **-0.4** |
| **35** | Nashville-Davidson-Murfreesboro, TN | 2.8 | 3.2 | -0.5 | 2.9 | **-0.1** |
| **36** | Buffalo-Niagara Falls, NY | 5.7 | 5.4 | 0.3 | 5.7 | **-0.1** |
| **37** | Honolulu, HI | -0.6 | -0.5 | -0.1 | -0.6 | **0.0** |
| **38** | St. Louis, MO-IL | 4.1 | 4.3 | -0.1 | 4.1 | **0.0** |
| **39** | Pittsburgh, PA | 4.6 | 4.5 | 0.1 | 4.6 | **0.0** |
| **40** | Cedar Rapids, IA | 3.2 | 3.4 | -0.2 | 3.1 | **0.0** |
| **41** | Bridgeport-Stamford-Norwalk, CT | -0.6 | -0.7 | 0.0 | -0.8 | **0.1** |
| **42** | Atlanta-Sandy Springs-Marietta, GA | 3.7 | 4.0 | -0.2 | 3.5 | **0.2** |
| **43** | Albuquerque, NM | 2.5 | 2.7 | -0.2 | 2.3 | **0.2** |
| **44** | Hartford-West Hartford-East Hartford, CT | 1.6 | 1.6 | 0.0 | 1.4 | **0.2** |
| **45** | Kansas City, MO-KS | 2.8 | 2.9 | -0.1 | 2.5 | **0.3** |
| **46** | Columbus, OH | 2.9 | 2.8 | 0.1 | 2.5 | **0.4** |
| **47** | Cleveland-Elyria-Mentor, OH | 3.6 | 3.5 | 0.2 | 3.2 | **0.5** |
| **48** | New Orleans-Metairie-Kenner, LA | 3.4 | 3.7 | -0.4 | 2.9 | **0.5** |
| **49** | Colorado Springs, CO | 2.0 | 2.1 | -0.1 | 1.5 | **0.6** |
| **50** | Omaha-Council Bluffs, NE-IA | 3.6 | 3.7 | 0.0 | 3.0 | **0.6** |
| **51** | Cincinnati-Middletown, OH-KY-IN | 3.0 | 2.8 | 0.3 | 2.3 | **0.7** |
| **52** | Indianapolis, IN | 4.4 | 3.9 | 0.5 | 3.5 | **0.9** |
| **53** | Austin-Round Rock, TX | 4.5 | 4.1 | 0.4 | 3.5 | **1.0** |
| **54** | Charlotte-Gastonia-Concord, NC-SC | 2.8 | 1.7 | 1.1 | 1.6 | **1.2** |
| **55** | Greensboro-High Point, NC | 3.0 | 2.1 | 0.9 | 1.7 | **1.3** |
| **56** | Memphis, TN-MS-AR | 3.2 | 2.3 | 0.9 | 1.9 | **1.3** |
| **57** | Houston-Baytown-Sugar Land, TX | 3.9 | 3.6 | 0.3 | 2.5 | **1.4** |
| **58** | San Antonio, TX | 4.2 | 3.7 | 0.5 | 2.6 | **1.6** |
| **59** | Dallas-Plano-Irving, TX (MSAD) | 5.2 | 4.0 | 1.2 | 3.0 | **2.2** |

Source: HSBC. Risk free rate is the 10-year Treasury note yield.

HSBC

# 2.7. Real total return (price growth plus net rental yield): states

| Rank | Area | 2005 | 20yr average | Deviation from 20yr average (ppt) | 30yr average | Deviation from 30yr average (ppt) |
|---|---|---|---|---|---|---|
| | United States (median) | 13.8 | 9.4 | 4.4 | 9.1 | 4.7 |
| | United States (average)* | 13.8 | 8.6 | 5.3 | 8.3 | 5.5 |
| | | | | | | |
| | Total Bubble Zone | 16.5 | 8.5 | 8.0 | 8.6 | 8.0 |
| | Eastern Bubble Zone | 15.4 | 8.7 | 6.7 | 8.7 | 6.6 |
| | Western Bubble Zone | 17.8 | 8.5 | 9.3 | 8.6 | 9.2 |
| | Non-Bubble Zone | 9.1 | 8.0 | 1.1 | 7.6 | 1.5 |
| | | | | | | |
| **1** | Arizona | **25.8** | 9.6 | 16.3 | 9.3 | 16.5 |
| **2** | Florida | **23.5** | 11.0 | 12.4 | 9.9 | 13.5 |
| **3** | Nevada | **22.2** | 9.8 | 12.4 | 9.1 | 13.1 |
| **4** | District of Columbia | **20.4** | 12.9 | 7.5 | 12.0 | 8.4 |
| **5** | California | **20.0** | 10.1 | 9.9 | 10.5 | 9.5 |
| **6** | Hawaii | **19.9** | 7.8 | 12.1 | 7.3 | 12.6 |
| **7** | Maryland | **19.5** | 9.5 | 10.0 | 9.0 | 10.5 |
| **8** | Virginia | **18.5** | 8.9 | 9.6 | 8.6 | 9.9 |
| **9** | Vermont | **16.0** | 11.6 | 4.4 | 11.3 | 4.6 |
| **10** | Delaware | **15.5** | 9.4 | 6.1 | 8.9 | 6.5 |
| **11** | New Jersey | **15.3** | 9.9 | 5.4 | 10.3 | 5.1 |
| **12** | Oregon | **15.0** | 10.2 | 4.8 | 9.2 | 5.8 |
| **13** | Pennsylvania | **14.9** | 10.9 | 3.9 | 10.3 | 4.5 |
| **14** | Idaho | **14.8** | 8.6 | 6.1 | 7.8 | 7.0 |
| **15** | Washington | **14.6** | 9.4 | 5.2 | 9.7 | 4.9 |
| **16** | Maine | **14.4** | 11.9 | 2.4 | 12.8 | 1.6 |
| **17** | Rhode Island | **14.1** | 11.0 | 3.1 | 10.5 | 3.6 |
| **18** | New York | **14.1** | 9.9 | 4.2 | 10.7 | 3.4 |
| **19** | New Mexico | **13.6** | 8.3 | 5.3 | 8.2 | 5.4 |
| **20** | Wyoming | **13.5** | 10.4 | 3.0 | 9.7 | 3.8 |
| **21** | West Virginia | **13.3** | 9.8 | 3.6 | 8.5 | 4.8 |
| **22** | Alaska | **13.1** | 7.2 | 5.9 | 7.8 | 5.3 |
| **23** | New Hampshire | **12.9** | 10.5 | 2.5 | 11.3 | 1.6 |
| **24** | Montana | **12.9** | 10.4 | 2.6 | 10.2 | 2.7 |
| **25** | Connecticut | **12.9** | 8.4 | 4.5 | 9.0 | 3.8 |
| **26** | North Dakota | **12.4** | 10.3 | 2.0 | 9.6 | 2.7 |
| **27** | Arkansas | **12.3** | 9.7 | 2.6 | 9.2 | 3.1 |
| **28** | South Dakota | **12.2** | 11.6 | 0.7 | 10.8 | 1.5 |
| **29** | Mississippi | **11.7** | 10.5 | 1.3 | 9.8 | 1.9 |
| **30** | Missouri | **11.4** | 9.9 | 1.5 | 9.5 | 1.9 |
| **31** | Illinois | **11.3** | 10.7 | 0.6 | 10.2 | 1.1 |
| **32** | Texas | **11.2** | 9.3 | 1.9 | 9.1 | 2.1 |
| **33** | South Carolina | **11.1** | 9.0 | 2.1 | 8.7 | 2.4 |
| **34** | Oklahoma | **11.0** | 10.1 | 1.0 | 10.1 | 1.0 |
| **35** | Massachusetts | **10.9** | 10.0 | 0.9 | 12.1 | -1.2 |
| **36** | Minnesota | **10.9** | 11.1 | -0.2 | 10.6 | 0.3 |
| **37** | Alabama | **10.9** | 8.8 | 2.1 | 8.1 | 2.7 |
| **38** | Wisconsin | **10.7** | 10.0 | 0.7 | 9.1 | 1.6 |
| **39** | Iowa | **10.5** | 11.5 | -1.0 | 10.4 | 0.1 |
| **40** | Louisiana | **10.5** | 9.1 | 1.4 | 8.7 | 1.8 |
| **41** | Tennessee | **10.4** | 9.1 | 1.3 | 8.8 | 1.6 |
| **42** | Utah | **10.3** | 7.7 | 2.6 | 7.6 | 2.6 |
| **43** | Nebraska | **10.2** | 10.3 | -0.1 | 9.6 | 0.7 |
| **44** | North Carolina | **9.9** | 8.3 | 1.6 | 8.2 | 1.7 |
| **45** | Kansas | **9.7** | 10.4 | -0.7 | 9.2 | 0.4 |
| **46** | Georgia | **9.6** | 9.3 | 0.3 | 8.7 | 0.9 |
| **47** | Kentucky | **9.4** | 10.0 | -0.6 | 9.4 | 0.0 |
| **48** | Indiana | **9.3** | 9.6 | -0.4 | 9.0 | 0.3 |
| **49** | Ohio | **8.1** | 9.2 | -1.0 | 8.4 | -0.2 |
| **50** | Michigan | **8.1** | 11.5 | -3.4 | 10.8 | -2.7 |
| **51** | Colorado | **7.2** | 8.9 | -1.7 | 9.2 | -2.0 |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices.

HSBC

# 2.8. Real total return (price growth plus net rental yield): cities

| Rank | Area | 2005 | 20yr average | Deviation from 20yr average (ppt) | 30yr average | Deviation from 30yr average (ppt) |
|---|---|---|---|---|---|---|
| 1 | Phoenix-Mesa-Scottdale, AZ | 28.0 | 9.4 | 18.6 | 9.3 | 18.7 |
| 2 | Palm Bay-Melbourne-Titusville, FL | 27.8 | 10.4 | 17.5 | 9.6 | 18.2 |
| 3 | Orlando, FL | 24.3 | 9.4 | 14.9 | 9.1 | 15.2 |
| 4 | Virginia Beach-Norfolk-Newport News, VA-NC | 22.3 | 9.2 | 13.1 | 9.3 | 13.0 |
| 5 | Tampa-St. Petersburg-Clearwater, FL | 21.0 | 10.3 | 10.8 | 9.8 | 11.3 |
| 6 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 21.0 | 9.2 | 11.8 | 8.1 | 12.9 |
| 7 | Miami-Miami Beach-Kendall, FL (MSAD) | 20.6 | 9.9 | 10.8 | 9.0 | 11.6 |
| 8 | Riverside-San Bernardino-Ontario, CA | 20.4 | 8.8 | 11.5 | 8.8 | 11.6 |
| 9 | Tucson, AZ | 20.3 | 8.4 | 11.9 | 8.2 | 12.1 |
| 10 | Sacramento-Arden-Arcade-Roseville, CA | 20.2 | 9.4 | 10.8 | 8.9 | 11.2 |
| 11 | Las Vegas-Paradise, NV | 20.1 | 8.5 | 11.6 | 7.2 | 12.9 |
| 12 | Baltimore-Towson, MD | 19.5 | 9.8 | 9.7 | 9.3 | 10.2 |
| 13 | Honolulu, HI | 19.4 | 7.1 | 12.3 | 7.0 | 12.4 |
| 14 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 19.3 | 8.8 | 10.5 | 9.5 | 9.8 |
| 15 | Oakland-Fremont-Hayward, CA (MSAD) | 18.3 | 8.1 | 10.3 | 8.1 | 10.2 |
| 16 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 16.4 | 8.1 | 8.3 | 8.1 | 8.4 |
| 17 | Philadelphia, PA (MSAD) | 15.6 | 10.6 | 5.0 | 10.0 | 5.6 |
| 18 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 15.4 | 9.2 | 6.2 | 9.3 | 6.1 |
| 19 | Edison, NJ (MSAD) | 15.1 | 9.8 | 5.2 | 10.0 | 5.1 |
| 20 | Charleston-North Charleston, SC | 14.7 | 8.5 | 6.3 | 8.2 | 6.6 |
| 21 | Portland-Vancouver-Beaverton, OR-WA | 14.6 | 9.6 | 5.0 | 8.6 | 6.0 |
| 22 | San Diego-Carlsbad-San Marcos, CA | 14.6 | 8.6 | 6.0 | 8.1 | 6.5 |
| 23 | Nassau-Suffolk, NY (MSAD) | 13.7 | 9.7 | 4.1 | 11.0 | 2.7 |
| 24 | New York-Wayne-White Plains, NY-NJ (MSAD) | 13.5 | 7.5 | 6.0 | 8.7 | 4.8 |
| 25 | Albuquerque, NM | 13.2 | 7.1 | 6.1 | 7.1 | 6.1 |
| 26 | New Haven-Milford, CT | 13.1 | 8.4 | 4.7 | 8.5 | 4.6 |
| 27 | Newark-Union, NJ-PA (MSAD) | 13.0 | 7.4 | 5.6 | 8.2 | 4.8 |
| 28 | Seattle-Bellevue-Everett, WA (MSAD) | 12.9 | 8.9 | 4.0 | 9.6 | 3.4 |
| 29 | Providence-New Bedford-Fall River, RI-MA | 12.5 | 9.7 | 2.8 | 9.5 | 3.0 |
| 30 | St. Louis, MO-IL | 11.5 | 9.2 | 2.3 | 9.3 | 2.3 |
| 31 | Hartford-West Hartford-East Hartford, CT | 11.4 | 7.3 | 4.1 | 7.4 | 4.0 |
| 32 | San Antonio, TX | 11.1 | 6.5 | 4.6 | 6.2 | 4.9 |
| 33 | Buffalo-Niagara Falls, NY | 11.1 | 10.2 | 0.9 | 10.4 | 0.7 |
| 34 | Bridgeport-Stamford-Norwalk, CT | 11.0 | 5.8 | 5.2 | 6.6 | 4.4 |
| 35 | Chicago-Naperville-Joliet, IL (MSAD) | 10.6 | 9.1 | 1.5 | 8.7 | 1.9 |
| 36 | Milwaukee-Waukesha-West Allis, WI | 10.4 | 8.2 | 2.2 | 6.8 | 3.6 |
| 37 | New Orleans-Metairie-Kenner, LA | 10.4 | 8.0 | 2.4 | 7.3 | 3.1 |
| 38 | Salt Lake City, UT | 10.3 | 8.5 | 1.7 | 8.2 | 2.1 |
| 39 | Minneapolis-St. Paul-Bloomington, MN-WI | 9.8 | 9.7 | 0.1 | 9.2 | 0.5 |
| 40 | Pittsburgh, PA | 9.8 | 9.5 | 0.2 | 9.0 | 0.7 |
| 41 | Boston-Quincy, MA (MSAD) | 9.7 | 9.4 | 0.3 | 11.2 | -1.5 |
| 42 | Nashville-Davidson-Murfreesboro, TN | 9.4 | 8.1 | 1.3 | 7.7 | 1.7 |
| 43 | Austin-Round Rock, TX | 8.9 | 7.6 | 1.3 | 8.5 | 0.4 |
| 44 | Dallas-Plano-Irving, TX (MSAD) | 8.7 | 6.7 | 2.0 | 7.3 | 1.4 |
| 45 | Atlanta-Sandy Springs-Marietta, GA | 8.6 | 8.8 | -0.2 | 8.2 | 0.4 |
| 46 | Indianapolis, IN | 8.6 | 8.5 | 0.0 | 8.1 | 0.5 |
| 47 | Houston-Baytown-Sugar Land, TX | 8.3 | 7.0 | 1.3 | 6.0 | 2.3 |
| 48 | Omaha-Council Bluffs, NE-IA | 8.3 | 8.2 | 0.1 | 7.4 | 0.8 |
| 49 | Colorado Springs, CO | 8.3 | 7.3 | 1.0 | 6.8 | 1.5 |
| 50 | Kansas City, MO-KS | 7.8 | 7.5 | 0.2 | 7.0 | 0.8 |
| 51 | Cincinnati-Middletown, OH-KY-IN | 7.7 | 7.8 | -0.1 | 6.9 | 0.9 |
| 52 | Memphis, TN-MS-AR | 7.7 | 6.3 | 1.4 | 6.0 | 1.7 |
| 53 | Columbus, OH | 7.5 | 8.0 | -0.5 | 7.2 | 0.3 |
| 54 | Cleveland-Elyria-Mentor, OH | 7.4 | 8.7 | -1.3 | 7.9 | -0.5 |
| 55 | Cedar Rapids, IA | 7.1 | 8.3 | -1.2 | 8.1 | -1.0 |
| 56 | Greensboro-High Point, NC | 6.7 | 6.3 | 0.4 | 6.0 | 0.7 |
| 57 | Charlotte-Gastonia-Concord, NC-SC | 6.7 | 6.4 | 0.3 | 6.4 | 0.3 |
| 58 | Detroit-Livonia-Dearborn, MI (MSAD) | 6.4 | 11.5 | -5.2 | 10.6 | -4.2 |
| 59 | Denver-Aurora, CO | 5.5 | 8.1 | -2.6 | 8.6 | -3.1 |

Source: HSBC

HSBC

# 3. PI, PR, and the link with future debt-servicing

- The drawback with price-income (PI) and price-rent (PR) ratios…
- …is that they don't take low mortgage rates directly into account
- What is less well-known is that they do so indirectly

## Don't dump PI and PR yet

Strong price growth momentum has resulted in very high prices relative to incomes and rents across the country. However, the price-to-income (PI) and price-to-rent (PR) ratios are not the best measures of valuations because they don't take low interest rates directly into account.

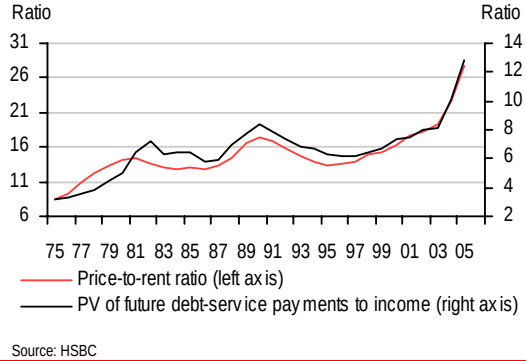
Still, they do take them into account *indirectly*. We note a strong link between PI and PR on the one hand, and the present value (PV) of future mortgage debt service payments on the other.

The PV of future debt-servicing is based on taking out a 30-year fixed mortgage rate of a median priced home and assumes a 20% down-payment. This way, the future monthly payments are fixed and known in advance, which is useful for our calculations. This obviously takes interest rates into account as rates are a key determinant of mortgage payments.

Next, we need to discount the next 360 months (30 years) of payments by expected long-run inflation. And then, we compare that present value of payments with household income to gauge the size of the debt burden relative to the past.

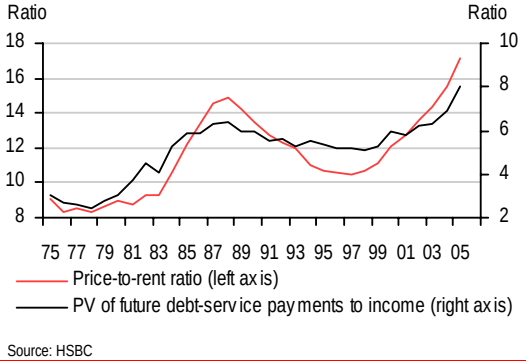
The lower that inflation expectations are, the higher the future debt-servicing burden in real terms will be. Of course, low expected inflation should also mean low nominal interest rates, and that reduces payment burden. The balance between low nominal rates reducing the burden but low inflation expectations (if realized) raising them needs to be weighed carefully, and the

**3A. California**




Source: HSBC

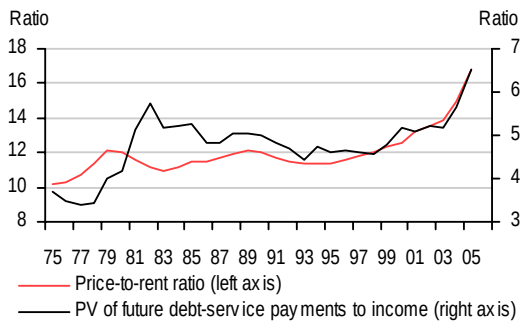
**3B. New York**




Source: HSBC

simple PI and PR ratios apparently do a pretty good job in giving a rough approximation for many housing markets.

**3C. US**




Source: HSBC

Charts 3A and 3B compare PR with the PV of future debt-servicing for California and New York. The correlation looks tight, so it may suggest that despite low rates, the PI and PR are correctly suggesting a bubble.

Care is therefore required, but indirectly, high PI and PR ratios still hold value in identifying rich markets because they are at least partly reflecting both interest rate and inflation expectation developments together.

## PI and PR trends in history

Despite their simplicity, this may be why both PI and PR ratios have provided early and useful signals of house price vulnerability in the past. In two instances, they reached at what were at the time historically high levels (in 1979 and 1989) *before* real US home price corrections began.

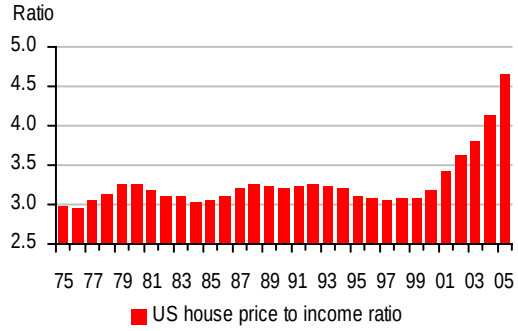
The rule of thumb was that housing looked relatively 'cheap' when PI was 3.0 times and 'expensive' at 3.3 times – a surprisingly (very) narrow 'trading range' that persisted for at least a quarter of a century between 1975-2000.

But things have been extraordinarily different in the past five years. The market reached a new high of 3.4 times in 2001 and has kept breaking records every year to be at 4.6 times in 2005. We have clearly broken out of the 'range' in a very dramatic way.

Meanwhile, PR used to signal a 'cheap' housing market at 11 times and an 'expensive' one at 12 times, again a very narrow 'trading range'. But again we have blasted off into uncharted territory, up from 12½ times in 1999 to over 16 times in 2005.

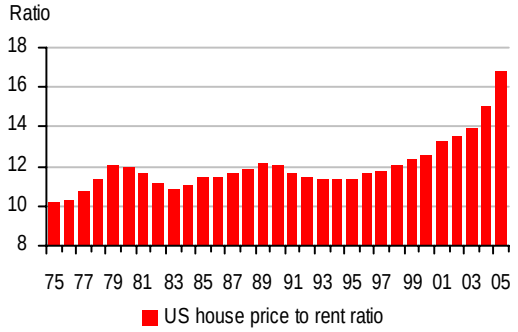
If PI and PR are to have a trend decline for a few years sometime in the future, history suggests it is likely to spell a period of weak house prices as opposed to unusually strong income or rent increases (the latter would cause higher interest rates given rents are 30% of the CPI, creating its own problem for house prices).

**3D. US house price-to-income ratio**




Source: HSBC

**3E. US house price-to-rent ratio**




Source: HSBC

HSBC

## Bubble zone trends

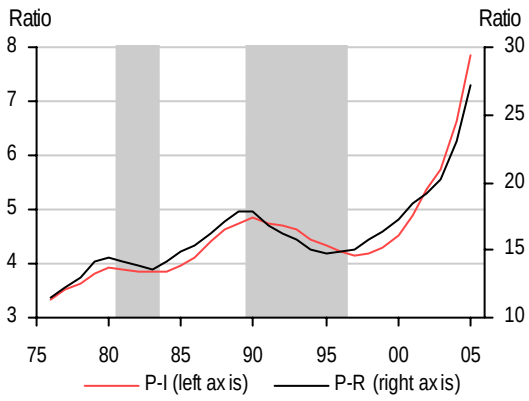
The PI and PR ratios look high for the US aggregates. However, many have commented that it is not the entire US housing market that is a potential bubble, and we agree. You can still get a cheap house in Texas, for instance.

Unsurprisingly, therefore, the bubble-zone PI and PR ratios have sky-rocketed in recent years, but just by how much still has the capacity to shock. The PI peaked at 5 times in the late 1980s before falling to just over 4 times in 1995. It has since risen to nearly 8 times in 2005, thereby doubling in a decade. Meanwhile, the PR ratio peaked at 18 times in the late 1980s before declining to 15 times. Now it's at a whopping 27 times.

Although inconclusive by themselves, these simple metrics suggest the possibility of a widespread housing bubble, but it is insufficient analysis in itself. We need to factor in more carefully and fully the low interest rate environment, which we do next in section 4.

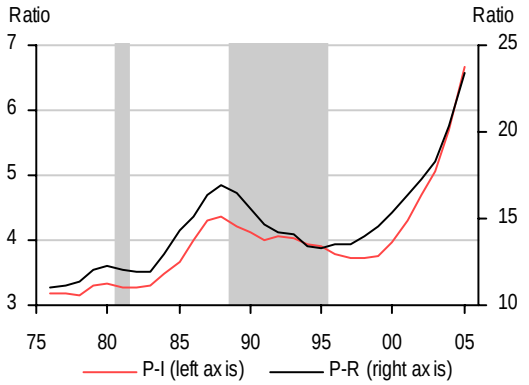
(See Appendix A for a comparison of US valuations with London and the UK.)

**3F. Bubble zone PI and PR ratios**



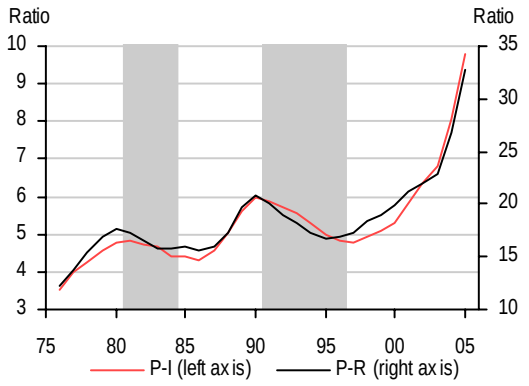

Source: HSBC, Shaded areas are periods of falling real house prices

**3G. Eastern bubble zone PI and PR ratios**




Source: HSBC, Shaded areas are periods of falling real house prices

**3H. Western bubble zone PI and PR ratios**




Source: HSBC, Shaded areas are periods of falling real house prices

HSBC

# 3.1. Price-to-income ratio: states

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| | United States (median) | 4.6 | 3.4 | 38 | 3.3 | 41 |
| | United States (average)* | 5.7 | 3.9 | 44 | 3.8 | 49 |
| | | | | | | |
| | Total Bubble Zone | 7.9 | 4.9 | 61 | 4.5 | 74 |
| | Eastern Bubble Zone | 6.6 | 4.3 | 53 | 4.0 | 66 |
| | Western Bubble Zone | 9.7 | 5.7 | 70 | 5.3 | 84 |
| | Non-Bubble Zone | 3.8 | 3.1 | 22 | 3.2 | 18 |
| | | | | | | |
| **1** | District of Columbia | 7.9 | 4.4 | 80 | 3.8 | **106** |
| **2** | California | 9.1 | 5.0 | 80 | 4.6 | **99** |
| **3** | Massachusetts | 5.9 | 3.9 | 50 | 3.5 | **69** |
| **4** | Oregon | 5.5 | 3.4 | 61 | 3.3 | **66** |
| **5** | New Jersey | 5.6 | 3.7 | 52 | 3.4 | **66** |
| **6** | Rhode Island | 5.4 | 3.6 | 50 | 3.3 | **65** |
| **7** | Florida | 5.1 | 3.1 | 64 | 3.1 | **65** |
| **8** | New York | 5.7 | 4.0 | 43 | 3.5 | **63** |
| **9** | Nevada | 5.8 | 3.6 | 62 | 3.6 | **62** |
| **10** | Hawaii | 9.6 | 6.7 | 43 | 6.1 | **56** |
| **11** | Maryland | 4.8 | 3.2 | 52 | 3.1 | **55** |
| **12** | Delaware | 4.5 | 3.2 | 44 | 3.0 | **51** |
| **13** | Virginia | 4.3 | 2.9 | 50 | 2.9 | **50** |
| **14** | Arizona | 4.9 | 3.1 | 54 | 3.3 | **49** |
| **15** | Montana | 4.3 | 2.9 | 47 | 2.9 | **49** |
| **16** | Washington | 4.9 | 3.5 | 39 | 3.3 | **47** |
| **17** | Maine | 3.9 | 2.9 | 38 | 2.7 | **45** |
| **18** | Michigan | 3.4 | 2.4 | 39 | 2.3 | **43** |
| **19** | Connecticut | 4.9 | 3.7 | 32 | 3.4 | **42** |
| **20** | New Hampshire | 3.9 | 2.9 | 37 | 2.8 | **38** |
| **21** | Illinois | 3.9 | 3.0 | 33 | 2.9 | **37** |
| **22** | Wisconsin | 3.3 | 2.4 | 36 | 2.5 | **32** |
| **23** | Pennsylvania | 3.3 | 2.6 | 26 | 2.5 | **31** |
| **24** | Colorado | 4.2 | 3.2 | 31 | 3.2 | **30** |
| **25** | Vermont | 3.8 | 2.9 | 28 | 2.9 | **30** |
| **26** | Minnesota | 3.3 | 2.5 | 30 | 2.6 | **26** |
| **27** | Alaska | 3.7 | 2.9 | 30 | 3.0 | **24** |
| **28** | Wyoming | 3.1 | 2.4 | 28 | 2.6 | **20** |
| **29** | Georgia | 3.5 | 2.8 | 25 | 2.9 | **19** |
| **30** | Kentucky | 3.0 | 2.5 | 21 | 2.5 | **18** |
| **31** | Missouri | 2.8 | 2.3 | 21 | 2.4 | **18** |
| **32** | Ohio | 2.9 | 2.5 | 18 | 2.5 | **17** |
| **33** | South Carolina | 3.1 | 2.6 | 23 | 2.7 | **16** |
| **34** | Kansas | 2.5 | 2.1 | 20 | 2.2 | **14** |
| **35** | North Carolina | 3.3 | 2.9 | 14 | 2.9 | **12** |
| **36** | Idaho | 3.3 | 2.8 | 18 | 3.0 | **11** |
| **37** | South Dakota | 2.5 | 2.2 | 14 | 2.3 | **10** |
| **38** | New Mexico | 3.7 | 3.4 | 11 | 3.4 | **9** |
| **39** | Iowa | 2.3 | 2.0 | 15 | 2.2 | **8** |
| **40** | Utah | 3.5 | 3.0 | 18 | 3.2 | **8** |
| **41** | Indiana | 2.6 | 2.4 | 10 | 2.4 | **8** |
| **42** | North Dakota | 2.6 | 2.2 | 17 | 2.4 | **7** |
| **43** | Alabama | 2.9 | 2.6 | 13 | 2.7 | **7** |
| **44** | Nebraska | 2.4 | 2.1 | 13 | 2.3 | **7** |
| **45** | Louisiana | 3.0 | 2.6 | 17 | 2.8 | **7** |
| **46** | Tennessee | 3.0 | 2.7 | 9 | 2.8 | **7** |
| **47** | West Virginia | 2.9 | 2.6 | 13 | 2.7 | **7** |
| **48** | Arkansas | 2.7 | 2.5 | 9 | 2.6 | **2** |
| **49** | Texas | 2.4 | 2.2 | 8 | 2.5 | **-2** |
| **50** | Oklahoma | 2.2 | 2.1 | 4 | 2.4 | **-6** |
| **51** | Mississippi | 2.4 | 2.4 | 2 | 2.6 | **-7** |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices.

HSBC

# 3.2. Price-to-income ratio: cities

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| 1 | Riverside-San Bernardino-Ontario, CA | 10.6 | 5.6 | 89 | 5.2 | 105 |
| 2 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 10.9 | 6.1 | 80 | 5.4 | 103 |
| 3 | Miami-Miami Beach-Kendall, FL (MSAD) | 8.3 | 4.4 | 88 | 4.2 | 97 |
| 4 | Sacramento-Arden-Arcade-Roseville, CA | 7.8 | 4.3 | 82 | 4.0 | 97 |
| 5 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 13.5 | 7.5 | 80 | 6.9 | 96 |
| 6 | Oakland-Fremont-Hayward, CA (MSAD) | 11.6 | 6.6 | 76 | 5.9 | 96 |
| 7 | San Diego-Carlsbad-San Marcos, CA | 11.7 | 6.6 | 77 | 6.1 | 92 |
| 8 | Nassau-Suffolk, NY (MSAD) | 7.5 | 4.5 | 66 | 4.0 | 90 |
| 9 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 11.3 | 7.2 | 57 | 6.4 | 77 |
| 10 | New York-Wayne-White Plains, NY-NJ (MSAD) | 8.9 | 5.7 | 56 | 5.0 | 76 |
| 11 | Providence-New Bedford-Fall River, RI-MA | 6.5 | 4.3 | 53 | 3.8 | 71 |
| 12 | Honolulu, HI | 10.1 | 6.6 | 52 | 6.0 | 69 |
| 13 | Palm Bay-Melbourne-Titusville, FL | 4.5 | 2.6 | 72 | 2.6 | 68 |
| 14 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 6.4 | 4.0 | 61 | 3.8 | 68 |
| 15 | Edison, NJ (MSAD) | 6.6 | 4.3 | 54 | 3.9 | 68 |
| 16 | Las Vegas-Paradise, NV | 7.2 | 4.3 | 66 | 4.4 | 64 |
| 17 | Phoenix-Mesa-Scottdale, AZ | 4.7 | 2.9 | 64 | 2.9 | 63 |
| 18 | Portland-Vancouver-Beaverton, OR-WA | 5.0 | 3.3 | 53 | 3.1 | 61 |
| 19 | Tampa-St. Petersburg-Clearwater, FL | 4.9 | 3.0 | 62 | 3.1 | 59 |
| 20 | Boston-Quincy, MA (MSAD) | 6.9 | 4.7 | 46 | 4.3 | 59 |
| 21 | Orlando, FL | 4.9 | 3.1 | 59 | 3.1 | 58 |
| 22 | Newark-Union, NJ-PA (MSAD) | 7.0 | 4.9 | 44 | 4.5 | 58 |
| 23 | Tucson, AZ | 5.5 | 3.6 | 53 | 3.6 | 54 |
| 24 | Baltimore-Towson, MD | 5.0 | 3.4 | 48 | 3.3 | 54 |
| 25 | Seattle-Bellevue-Everett, WA (MSAD) | 6.0 | 4.3 | 41 | 4.0 | 52 |
| 26 | Virginia Beach-Norfolk-Newport News, VA-NC | 4.2 | 2.8 | 49 | 2.7 | 51 |
| 27 | Chicago-Naperville-Joliet, IL (MSAD) | 4.9 | 3.5 | 40 | 3.3 | 47 |
| 28 | Minneapolis-St. Paul-Bloomington, MN-WI | 3.9 | 2.7 | 44 | 2.7 | 44 |
| 29 | Charleston-North Charleston, SC | 4.7 | 3.3 | 42 | 3.3 | 42 |
| 30 | Philadelphia, PA (MSAD) | 3.9 | 2.9 | 34 | 2.8 | 42 |
| 31 | Detroit-Livonia-Dearborn, MI (MSAD) | 3.0 | 2.3 | 30 | 2.2 | 40 |
| 32 | New Haven-Milford, CT | 5.5 | 4.2 | 31 | 3.9 | 39 |
| 33 | Bridgeport-Stamford-Norwalk, CT | 5.7 | 4.3 | 31 | 4.2 | 35 |
| 34 | Milwaukee-Waukesha-West Allis, WI | 4.3 | 3.2 | 32 | 3.2 | 32 |
| 35 | Denver-Aurora, CO | 4.3 | 3.3 | 29 | 3.3 | 30 |
| 36 | Hartford-West Hartford-East Hartford, CT | 4.5 | 3.6 | 23 | 3.5 | 27 |
| 37 | Colorado Springs, CO | 3.9 | 3.1 | 25 | 3.1 | 24 |
| 38 | Salt Lake City, UT | 3.2 | 2.6 | 22 | 2.6 | 23 |
| 39 | St. Louis, MO-IL | 2.8 | 2.3 | 24 | 2.3 | 22 |
| 40 | Atlanta-Sandy Springs-Marietta, GA | 3.0 | 2.5 | 21 | 2.5 | 19 |
| 41 | Cleveland-Elyria-Mentor, OH | 3.1 | 2.7 | 17 | 2.6 | 18 |
| 42 | Albuquerque, NM | 3.7 | 3.2 | 17 | 3.2 | 15 |
| 43 | Kansas City, MO-KS | 3.1 | 2.6 | 19 | 2.7 | 14 |
| 44 | Columbus, OH | 3.1 | 2.7 | 13 | 2.7 | 12 |
| 45 | New Orleans-Metairie-Kenner, LA | 3.5 | 3.0 | 20 | 3.2 | 12 |
| 46 | Greensboro-High Point, NC | 3.4 | 3.0 | 12 | 3.0 | 11 |
| 47 | Pittsburgh, PA | 2.8 | 2.5 | 13 | 2.6 | 10 |
| 48 | Nashville-Davidson-Murfreesboro, TN | 3.1 | 2.8 | 12 | 2.8 | 10 |
| 49 | Austin-Round Rock, TX | 3.4 | 2.9 | 16 | 3.1 | 10 |
| 50 | Cedar Rapids, IA | 2.6 | 2.4 | 10 | 2.4 | 10 |
| 51 | Omaha-Council Bluffs, NE-IA | 2.8 | 2.4 | 14 | 2.5 | 10 |
| 52 | Cincinnati-Middletown, OH-KY-IN | 3.0 | 2.7 | 12 | 2.7 | 10 |
| 53 | Buffalo-Niagara Falls, NY | 2.3 | 2.2 | 6 | 2.1 | 10 |
| 54 | Charlotte-Gastonia-Concord, NC-SC | 3.5 | 3.2 | 10 | 3.3 | 7 |
| 55 | Indianapolis, IN | 2.5 | 2.3 | 7 | 2.4 | 6 |
| 56 | Dallas-Plano-Irving, TX (MSAD) | 2.9 | 2.7 | 7 | 2.9 | -2 |
| 57 | Memphis, TN-MS-AR | 3.2 | 3.1 | 2 | 3.2 | -2 |
| 58 | San Antonio, TX | 3.1 | 2.9 | 8 | 3.2 | -2 |
| 59 | Houston-Baytown-Sugar Land, TX | 2.9 | 2.7 | 10 | 3.0 | -3 |

Source: HSBC

HSBC

# 3.3. Price-to-rent ratio: states

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| | United States (median) | 16.9 | 12.5 | 35 | 12.1 | 40 |
| | United States (average)* | 20.7 | 14.6 | 42 | 14.0 | 48 |
| | | | | | | |
| | Total Bubble Zone | 27.2 | 17.5 | 56 | 16.2 | 68 |
| | Eastern Bubble Zone | 23.4 | 15.9 | 48 | 14.6 | 61 |
| | Western Bubble Zone | 32.7 | 19.9 | 64 | 18.5 | 77 |
| | Non-Bubble Zone | 15.9 | 12.9 | 23 | 12.8 | 24 |
| | | | | | | |
| **1** | California | 27.9 | 16.4 | 70 | 15.2 | **84** |
| **2** | District of Columbia | 20.5 | 11.8 | 73 | 11.6 | **77** |
| **3** | Florida | 17.9 | 11.0 | 63 | 10.8 | **66** |
| **4** | Maryland | 22.3 | 14.5 | 55 | 13.5 | **65** |
| **5** | Rhode Island | 20.8 | 13.7 | 51 | 12.7 | **64** |
| **6** | Nevada | 21.8 | 13.2 | 66 | 13.4 | **63** |
| **7** | Oregon | 22.0 | 14.2 | 55 | 13.6 | **62** |
| **8** | Montana | 17.5 | 11.3 | 54 | 10.8 | **62** |
| **9** | Arizona | 19.0 | 12.0 | 58 | 11.9 | **60** |
| **10** | Washington | 21.7 | 14.7 | 48 | 13.6 | **60** |
| **11** | Hawaii | 32.8 | 22.3 | 47 | 20.5 | **60** |
| **12** | Massachusetts | 18.7 | 13.3 | 41 | 11.7 | **60** |
| **13** | New Jersey | 19.9 | 13.6 | 46 | 12.6 | **58** |
| **14** | Virginia | 20.7 | 14.4 | 44 | 13.3 | **56** |
| **15** | Maine | 14.4 | 10.1 | 42 | 9.2 | **56** |
| **16** | Vermont | 14.7 | 10.3 | 43 | 9.5 | **55** |
| **17** | Delaware | 18.8 | 13.4 | 40 | 12.4 | **51** |
| **18** | Wyoming | 15.6 | 10.3 | 52 | 10.7 | **46** |
| **19** | New York | 17.1 | 12.9 | 33 | 11.7 | **46** |
| **20** | Illinois | 15.1 | 11.1 | 36 | 10.4 | **45** |
| **21** | Minnesota | 14.9 | 10.8 | 39 | 10.4 | **43** |
| **22** | New Hampshire | 15.5 | 11.6 | 34 | 10.8 | **43** |
| **23** | Colorado | 17.8 | 13.3 | 34 | 12.7 | **40** |
| **24** | Connecticut | 19.0 | 14.6 | 30 | 13.8 | **38** |
| **25** | Wisconsin | 15.6 | 11.7 | 33 | 11.3 | **38** |
| **26** | Michigan | 13.4 | 10.5 | 27 | 9.9 | **35** |
| **27** | Pennsylvania | 13.5 | 10.5 | 29 | 10.0 | **35** |
| **28** | Utah | 18.7 | 14.7 | 27 | 14.1 | **33** |
| **29** | Alaska | 15.7 | 12.1 | 30 | 11.9 | **32** |
| **30** | Kentucky | 13.2 | 10.5 | 25 | 10.1 | **31** |
| **31** | North Dakota | 12.5 | 9.3 | 35 | 9.6 | **30** |
| **32** | South Dakota | 11.5 | 9.0 | 27 | 8.9 | **29** |
| **33** | Idaho | 16.0 | 12.5 | 28 | 12.5 | **28** |
| **34** | West Virginia | 12.7 | 10.2 | 25 | 10.2 | **24** |
| **35** | New Mexico | 15.2 | 11.9 | 28 | 12.3 | **24** |
| **36** | South Carolina | 13.6 | 11.4 | 20 | 11.1 | **23** |
| **37** | Iowa | 11.3 | 9.0 | 25 | 9.2 | **23** |
| **38** | Tennessee | 12.9 | 10.9 | 18 | 10.7 | **21** |
| **39** | Georgia | 13.1 | 10.9 | 20 | 10.9 | **20** |
| **40** | Missouri | 12.1 | 10.3 | 17 | 10.2 | **19** |
| **41** | Alabama | 13.2 | 11.1 | 18 | 11.1 | **18** |
| **42** | Kansas | 11.8 | 9.5 | 25 | 10.1 | **17** |
| **43** | Ohio | 13.4 | 11.6 | 16 | 11.4 | **17** |
| **44** | Oklahoma | 10.5 | 8.7 | 21 | 9.1 | **15** |
| **45** | Nebraska | 11.3 | 9.7 | 17 | 9.8 | **15** |
| **46** | Arkansas | 11.5 | 9.6 | 19 | 10.0 | **14** |
| **47** | Louisiana | 12.4 | 10.2 | 22 | 10.9 | **14** |
| **48** | North Carolina | 13.3 | 12.2 | 10 | 11.8 | **13** |
| **49** | Indiana | 11.7 | 10.5 | 12 | 10.4 | **12** |
| **50** | Mississippi | 9.8 | 8.8 | 11 | 8.9 | **10** |
| **51** | Texas | 9.8 | 9.1 | 8 | 10.0 | **-2** |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices.

HSBC

# 3.4. Price-to-rent ratio: cities

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| 1 | Riverside-San Bernardino-Ontario, CA | 32.6 | 17.7 | 84 | 16.6 | 96 |
| 2 | Miami-Miami Beach-Kendall, FL (MSAD) | 27.3 | 15.0 | 83 | 14.1 | 93 |
| 3 | Nassau-Suffolk, NY (MSAD) | 25.5 | 15.7 | 62 | 13.8 | 84 |
| 4 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 40.5 | 23.7 | 71 | 22.5 | 79 |
| 5 | Palm Bay-Melbourne-Titusville, FL | 20.6 | 11.6 | 77 | 11.5 | 79 |
| 6 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 32.3 | 20.1 | 61 | 18.2 | 78 |
| 7 | Oakland-Fremont-Hayward, CA (MSAD) | 41.6 | 25.5 | 63 | 23.8 | 75 |
| 8 | San Diego-Carlsbad-San Marcos, CA | 38.2 | 23.5 | 63 | 21.8 | 75 |
| 9 | Sacramento-Arden-Arcade-Roseville, CA | 28.5 | 17.8 | 60 | 16.7 | 71 |
| 10 | Seattle-Bellevue-Everett, WA (MSAD) | 26.5 | 17.3 | 53 | 15.5 | 71 |
| 11 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 32.7 | 21.3 | 54 | 19.7 | 66 |
| 12 | Providence-New Bedford-Fall River, RI-MA | 24.5 | 16.3 | 51 | 15.0 | 64 |
| 13 | Phoenix-Mesa-Scottdale, AZ | 19.8 | 12.3 | 61 | 12.2 | 62 |
| 14 | Baltimore-Towson, MD | 20.5 | 13.4 | 53 | 12.7 | 62 |
| 15 | Tucson, AZ | 22.3 | 14.1 | 58 | 13.8 | 61 |
| 16 | Newark-Union, NJ-PA (MSAD) | 29.8 | 20.2 | 47 | 18.6 | 60 |
| 17 | New York-Wayne-White Plains, NY-NJ (MSAD) | 30.1 | 21.3 | 41 | 18.9 | 60 |
| 18 | Portland-Vancouver-Beaverton, OR-WA | 22.9 | 15.1 | 52 | 14.3 | 60 |
| 19 | Boston-Quincy, MA (MSAD) | 22.0 | 15.3 | 44 | 13.9 | 58 |
| 20 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 25.3 | 16.2 | 56 | 16.1 | 56 |
| 21 | Chicago-Naperville-Joliet, IL (MSAD) | 20.5 | 14.3 | 43 | 13.2 | 56 |
| 22 | Las Vegas-Paradise, NV | 25.1 | 15.5 | 62 | 16.2 | 56 |
| 23 | Charleston-North Charleston, SC | 22.2 | 15.0 | 48 | 14.4 | 54 |
| 24 | Virginia Beach-Norfolk-Newport News, VA-NC | 18.2 | 12.5 | 46 | 11.9 | 53 |
| 25 | Tampa-St. Petersburg-Clearwater, FL | 17.3 | 11.4 | 52 | 11.4 | 52 |
| 26 | Edison, NJ (MSAD) | 20.9 | 14.6 | 43 | 13.7 | 52 |
| 27 | Honolulu, HI | 34.8 | 24.8 | 40 | 23.0 | 51 |
| 28 | Orlando, FL | 17.8 | 12.1 | 48 | 12.1 | 47 |
| 29 | Bridgeport-Stamford-Norwalk, CT | 35.2 | 25.6 | 37 | 23.9 | 47 |
| 30 | Philadelphia, PA (MSAD) | 16.4 | 12.0 | 38 | 11.3 | 45 |
| 31 | Minneapolis-St. Paul-Bloomington, MN-WI | 17.8 | 12.8 | 39 | 12.3 | 44 |
| 32 | New Haven-Milford, CT | 20.8 | 15.2 | 37 | 14.6 | 43 |
| 33 | Denver-Aurora, CO | 19.6 | 14.5 | 35 | 13.8 | 42 |
| 34 | Milwaukee-Waukesha-West Allis, WI | 20.8 | 15.3 | 36 | 14.8 | 41 |
| 35 | Salt Lake City, UT | 17.9 | 13.7 | 31 | 13.0 | 38 |
| 36 | Detroit-Livonia-Dearborn, MI (MSAD) | 14.3 | 11.2 | 27 | 10.5 | 36 |
| 37 | Nashville-Davidson-Murfreesboro, TN | 16.0 | 12.7 | 25 | 12.3 | 29 |
| 38 | Hartford-West Hartford-East Hartford, CT | 19.6 | 16.1 | 22 | 15.5 | 27 |
| 39 | Albuquerque, NM | 16.6 | 13.6 | 22 | 13.6 | 22 |
| 40 | Colorado Springs, CO | 18.1 | 14.9 | 22 | 14.9 | 21 |
| 41 | Cedar Rapids, IA | 15.0 | 12.8 | 18 | 12.5 | 20 |
| 42 | St. Louis, MO-IL | 13.1 | 11.3 | 17 | 11.0 | 20 |
| 43 | Kansas City, MO-KS | 16.0 | 13.3 | 20 | 13.4 | 20 |
| 44 | Atlanta-Sandy Springs-Marietta, GA | 13.8 | 11.7 | 19 | 11.7 | 18 |
| 45 | Columbus, OH | 15.6 | 13.4 | 16 | 13.3 | 18 |
| 46 | Pittsburgh, PA | 12.3 | 11.0 | 12 | 10.5 | 17 |
| 47 | Buffalo-Niagara Falls, NY | 10.9 | 10.0 | 9 | 9.3 | 17 |
| 48 | Omaha-Council Bluffs, NE-IA | 14.0 | 12.1 | 16 | 12.2 | 15 |
| 49 | New Orleans-Metairie-Kenner, LA | 14.6 | 12.0 | 21 | 12.8 | 14 |
| 50 | Cleveland-Elyria-Mentor, OH | 14.1 | 12.4 | 13 | 12.3 | 14 |
| 51 | Cincinnati-Middletown, OH-KY-IN | 15.3 | 13.5 | 13 | 13.6 | 13 |
| 52 | Indianapolis, IN | 12.6 | 11.7 | 8 | 11.7 | 8 |
| 53 | Austin-Round Rock, TX | 12.5 | 11.5 | 9 | 11.8 | 6 |
| 54 | Charlotte-Gastonia-Concord, NC-SC | 15.9 | 15.7 | 1 | 15.0 | 6 |
| 55 | Greensboro-High Point, NC | 15.3 | 14.8 | 4 | 14.5 | 6 |
| 56 | Memphis, TN-MS-AR | 15.0 | 14.4 | 4 | 14.4 | 4 |
| 57 | San Antonio, TX | 13.0 | 12.0 | 8 | 12.9 | 1 |
| 58 | Houston-Baytown-Sugar Land, TX | 13.5 | 12.1 | 12 | 13.6 | -1 |
| 59 | Dallas-Plano-Irving, TX (MSAD) | 11.5 | 11.7 | -1 | 12.9 | -11 |

Source: HSBC

HSBC

# 3.5. PV of future debt-service costs versus income: states

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| | United States (median) | 6.5 | 5.0 | 31 | 4.8 | 35 |
| | United States (average)* | 8.0 | 5.8 | 37 | 5.6 | 43 |
| | | | | | | |
| | Total Bubble Zone | 11.1 | 7.2 | 54 | 6.6 | 67 |
| | Eastern Bubble Zone | 9.3 | 6.4 | 46 | 5.9 | 59 |
| | Western Bubble Zone | 13.8 | 8.5 | 62 | 7.8 | 76 |
| | Non-Bubble Zone | 5.3 | 4.6 | 16 | 4.7 | 14 |
| | | | | | | |
| **1** | District of Columbia | 11.1 | 6.5 | 72 | 5.6 | **97** |
| **2** | California | 12.8 | 7.5 | 72 | 6.7 | **91** |
| **3** | Massachusetts | 8.3 | 5.9 | 43 | 5.2 | **62** |
| **4** | Oregon | 7.8 | 5.1 | 54 | 4.9 | **60** |
| **5** | Rhode Island | 7.7 | 5.4 | 43 | 4.8 | **59** |
| **6** | New Jersey | 7.9 | 5.4 | 45 | 5.0 | **59** |
| **7** | Florida | 7.2 | 4.6 | 56 | 4.6 | **58** |
| **8** | New York | 8.0 | 5.9 | 37 | 5.2 | **56** |
| **9** | Nevada | 8.3 | 5.4 | 54 | 5.3 | **55** |
| **10** | Hawaii | 13.6 | 10.0 | 36 | 9.1 | **50** |
| **11** | Maryland | 6.8 | 4.7 | 45 | 4.5 | **50** |
| **12** | Delaware | 6.4 | 4.7 | 37 | 4.4 | **45** |
| **13** | Virginia | 6.1 | 4.3 | 43 | 4.2 | **45** |
| **14** | Arizona | 6.9 | 4.7 | 47 | 4.8 | **43** |
| **15** | Montana | 6.1 | 4.4 | 40 | 4.2 | **43** |
| **16** | Washington | 7.0 | 5.2 | 33 | 4.9 | **42** |
| **17** | Maine | 5.6 | 4.2 | 31 | 4.0 | **39** |
| **18** | Michigan | 4.8 | 3.6 | 33 | 3.4 | **38** |
| **19** | Connecticut | 6.9 | 5.5 | 25 | 5.1 | **36** |
| **20** | New Hampshire | 5.6 | 4.3 | 30 | 4.2 | **33** |
| **21** | Illinois | 5.6 | 4.4 | 26 | 4.2 | **32** |
| **22** | Wisconsin | 4.7 | 3.6 | 30 | 3.7 | **28** |
| **23** | Pennsylvania | 4.7 | 3.9 | 20 | 3.7 | **26** |
| **24** | Vermont | 5.3 | 4.4 | 22 | 4.3 | **25** |
| **25** | Colorado | 5.9 | 4.7 | 25 | 4.7 | **25** |
| **26** | Minnesota | 4.6 | 3.7 | 24 | 3.8 | **21** |
| **27** | Alaska | 5.3 | 4.3 | 24 | 4.5 | **18** |
| **28** | Wyoming | 4.4 | 3.6 | 22 | 3.8 | **15** |
| **29** | Georgia | 4.9 | 4.1 | 19 | 4.3 | **15** |
| **30** | Kentucky | 4.2 | 3.7 | 15 | 3.7 | **14** |
| **31** | Missouri | 4.0 | 3.4 | 15 | 3.5 | **14** |
| **32** | Ohio | 4.1 | 3.7 | 12 | 3.7 | **13** |
| **33** | South Carolina | 4.5 | 3.8 | 17 | 4.0 | **12** |
| **34** | Kansas | 3.6 | 3.1 | 14 | 3.3 | **10** |
| **35** | North Carolina | 4.7 | 4.3 | 9 | 4.3 | **8** |
| **36** | Idaho | 4.7 | 4.2 | 12 | 4.4 | **7** |
| **37** | South Dakota | 3.5 | 3.3 | 8 | 3.3 | **5** |
| **38** | Iowa | 3.3 | 3.0 | 9 | 3.2 | **5** |
| **39** | Utah | 4.9 | 4.4 | 12 | 4.7 | **4** |
| **40** | New Mexico | 5.3 | 5.0 | 5 | 5.1 | **4** |
| **41** | Indiana | 3.7 | 3.6 | 5 | 3.6 | **4** |
| **42** | North Dakota | 3.6 | 3.3 | 11 | 3.5 | **4** |
| **43** | Alabama | 4.1 | 3.8 | 8 | 4.0 | **3** |
| **44** | Nebraska | 3.4 | 3.2 | 8 | 3.3 | **3** |
| **45** | West Virginia | 4.1 | 3.8 | 8 | 4.0 | **3** |
| **46** | Louisiana | 4.2 | 3.8 | 11 | 4.1 | **3** |
| **47** | Tennessee | 4.2 | 4.1 | 4 | 4.1 | **3** |
| **48** | Arkansas | 3.8 | 3.7 | 3 | 3.9 | **-2** |
| **49** | Texas | 3.4 | 3.3 | 3 | 3.6 | **-6** |
| **50** | Oklahoma | 3.1 | 3.2 | -1 | 3.5 | **-10** |
| **51** | Mississippi | 3.5 | 3.6 | -3 | 3.9 | **-11** |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices.

HSBC

# 3.6. PV of future debt-service costs versus income: cities

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| 1 | Riverside-San Bernardino-Ontario, CA | 10.6 | 5.6 | 89 | 5.2 | 105 |
| 2 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 10.9 | 6.1 | 80 | 5.4 | 103 |
| 3 | Miami-Miami Beach-Kendall, FL (MSAD) | 8.3 | 4.4 | 88 | 4.2 | 97 |
| 4 | Sacramento-Arden-Arcade-Roseville, CA | 7.8 | 4.3 | 82 | 4.0 | 97 |
| 5 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 13.5 | 7.5 | 80 | 6.9 | 96 |
| 6 | Oakland-Fremont-Hayward, CA (MSAD) | 11.6 | 6.6 | 76 | 5.9 | 96 |
| 7 | San Diego-Carlsbad-San Marcos, CA | 11.7 | 6.6 | 77 | 6.1 | 92 |
| 8 | Nassau-Suffolk, NY (MSAD) | 7.5 | 4.5 | 66 | 4.0 | 90 |
| 9 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 11.3 | 7.2 | 57 | 6.4 | 77 |
| 10 | New York-Wayne-White Plains, NY-NJ (MSAD) | 8.9 | 5.7 | 56 | 5.0 | 76 |
| 11 | Providence-New Bedford-Fall River, RI-MA | 6.5 | 4.3 | 53 | 3.8 | 71 |
| 12 | Honolulu, HI | 10.1 | 6.6 | 52 | 6.0 | 69 |
| 13 | Palm Bay-Melbourne-Titusville, FL | 4.5 | 2.6 | 72 | 2.6 | 68 |
| 14 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 6.4 | 4.0 | 61 | 3.8 | 68 |
| 15 | Edison, NJ (MSAD) | 6.6 | 4.3 | 54 | 3.9 | 68 |
| 16 | Las Vegas-Paradise, NV | 7.2 | 4.3 | 66 | 4.4 | 64 |
| 17 | Phoenix-Mesa-Scottdale, AZ | 4.7 | 2.9 | 64 | 2.9 | 63 |
| 18 | Portland-Vancouver-Beaverton, OR-WA | 5.0 | 3.3 | 53 | 3.1 | 61 |
| 19 | Tampa-St. Petersburg-Clearwater, FL | 4.9 | 3.0 | 62 | 3.1 | 59 |
| 20 | Boston-Quincy, MA (MSAD) | 6.9 | 4.7 | 46 | 4.3 | 59 |
| 21 | Orlando, FL | 4.9 | 3.1 | 59 | 3.1 | 58 |
| 22 | Newark-Union, NJ-PA (MSAD) | 7.0 | 4.9 | 44 | 4.5 | 58 |
| 23 | Tucson, AZ | 5.5 | 3.6 | 53 | 3.6 | 54 |
| 24 | Baltimore-Towson, MD | 5.0 | 3.4 | 48 | 3.3 | 54 |
| 25 | Seattle-Bellevue-Everett, WA (MSAD) | 6.0 | 4.3 | 41 | 4.0 | 52 |
| 26 | Virginia Beach-Norfolk-Newport News, VA-NC | 4.2 | 2.8 | 49 | 2.7 | 51 |
| 27 | Chicago-Naperville-Joliet, IL (MSAD) | 4.9 | 3.5 | 40 | 3.3 | 47 |
| 28 | Minneapolis-St. Paul-Bloomington, MN-WI | 3.9 | 2.7 | 44 | 2.7 | 44 |
| 29 | Charleston-North Charleston, SC | 4.7 | 3.3 | 42 | 3.3 | 42 |
| 30 | Philadelphia, PA (MSAD) | 3.9 | 2.9 | 34 | 2.8 | 42 |
| 31 | Detroit-Livonia-Dearborn, MI (MSAD) | 3.0 | 2.3 | 30 | 2.2 | 40 |
| 32 | New Haven-Milford, CT | 5.5 | 4.2 | 31 | 3.9 | 39 |
| 33 | Bridgeport-Stamford-Norwalk, CT | 5.7 | 4.3 | 31 | 4.2 | 35 |
| 34 | Milwaukee-Waukesha-West Allis, WI | 4.3 | 3.2 | 32 | 3.2 | 32 |
| 35 | Denver-Aurora, CO | 4.3 | 3.3 | 29 | 3.3 | 30 |
| 36 | Hartford-West Hartford-East Hartford, CT | 4.5 | 3.6 | 23 | 3.5 | 27 |
| 37 | Colorado Springs, CO | 3.9 | 3.1 | 25 | 3.1 | 24 |
| 38 | Salt Lake City, UT | 3.2 | 2.6 | 22 | 2.6 | 23 |
| 39 | St. Louis, MO-IL | 2.8 | 2.3 | 24 | 2.3 | 22 |
| 40 | Atlanta-Sandy Springs-Marietta, GA | 3.0 | 2.5 | 21 | 2.5 | 19 |
| 41 | Cleveland-Elyria-Mentor, OH | 3.1 | 2.7 | 17 | 2.6 | 18 |
| 42 | Albuquerque, NM | 3.7 | 3.2 | 17 | 3.2 | 15 |
| 43 | Kansas City, MO-KS | 3.1 | 2.6 | 19 | 2.7 | 14 |
| 44 | Columbus, OH | 3.1 | 2.7 | 13 | 2.7 | 12 |
| 45 | New Orleans-Metairie-Kenner, LA | 3.5 | 3.0 | 20 | 3.2 | 12 |
| 46 | Greensboro-High Point, NC | 3.4 | 3.0 | 12 | 3.0 | 11 |
| 47 | Pittsburgh, PA | 2.8 | 2.5 | 13 | 2.6 | 10 |
| 48 | Nashville-Davidson-Murfreesboro, TN | 3.1 | 2.8 | 12 | 2.8 | 10 |
| 49 | Austin-Round Rock, TX | 3.4 | 2.9 | 16 | 3.1 | 10 |
| 50 | Cedar Rapids, IA | 2.6 | 2.4 | 10 | 2.4 | 10 |
| 51 | Omaha-Council Bluffs, NE-IA | 2.8 | 2.4 | 14 | 2.5 | 10 |
| 52 | Cincinnati-Middletown, OH-KY-IN | 3.0 | 2.7 | 12 | 2.7 | 10 |
| 53 | Buffalo-Niagara Falls, NY | 2.3 | 2.2 | 6 | 2.1 | 10 |
| 54 | Charlotte-Gastonia-Concord, NC-SC | 3.5 | 3.2 | 10 | 3.3 | 7 |
| 55 | Indianapolis, IN | 2.5 | 2.3 | 7 | 2.4 | 6 |
| 56 | Dallas-Plano-Irving, TX (MSAD) | 2.9 | 2.7 | 7 | 2.9 | -2 |
| 57 | Memphis, TN-MS-AR | 3.2 | 3.1 | 2 | 3.2 | -2 |
| 58 | San Antonio, TX | 3.1 | 2.9 | 8 | 3.2 | -2 |
| 59 | Houston-Baytown-Sugar Land, TX | 2.9 | 2.7 | 10 | 3.0 | -3 |

Source: HSBC

# 4. Homeowner costs

- Low interest rates and tax advantages lower homeowner costs
- Still, homeowner costs compared to income or rent are very high…
- …suggesting low rates cannot fully explain today's high prices

## Real estate is a (very) long duration asset

Admittedly, PI and PR ratios do not systematically and fully take into account interest rates. This section fixes that problem.

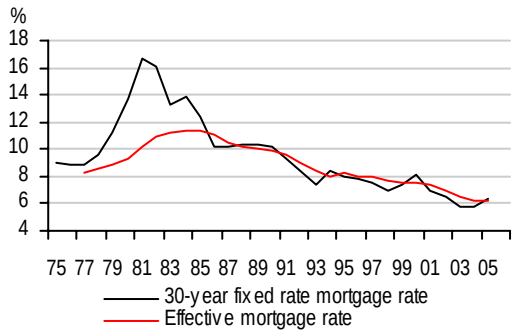
The average or effective mortgage rate that US households pay has steadily declined over the past 20 years. It now stands at 6¼%, compared with 10% in the late 1980s and a high of 11½% in the early 1980s.

As chart 4A shows, the effective mortgage rate moves smoothly through time (smoother than market rates) as the effective rate takes into account the mostly fixed rate liability structure of household debt. Although the proportion of adjustable rate mortgages has risen, it is estimated to be only roughly 25% or so of the stock of all regular mortgage liabilities.

However, it is not obvious that the real mortgage rate is all that much lower. With long-run inflation expectations at 2½% today, the 30-year real mortgage rate stands at 3.8%, using a 30-year fixed mortgage rate of 6.3% at the time of writing.

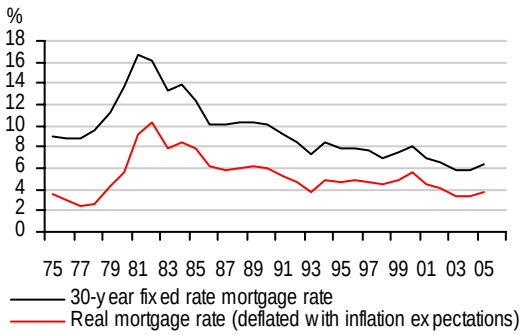
This is certainly lower than the 1975-2005 average of 5.2%, but surely not *that* much lower that PI and PR ratios should have doubled for a large part of the country. After all, the big decline in real rates happened between 1982 and 1994, when they fell by 600bp. In contrast, real rates are lower by about 100bp today compared to 1995.

**4A. Effective mortgage rate has fallen**




Source: Bureau of Economic Analysis, Federal Reserve

**4B. Real and nominal mortgage rates**




Source: HSBC, Bureau of Economic Analysis, Federal Reserve, Survey of Professional Forecasters

What's more, the real rate today is the same as in 1993 and a bit higher than the 1975-1980 average of 3.6%, when PI and PR ratios were much lower. This suggests the possibility of some "nominal illusion" going on here.

(The counter-argument is that the high nominal interest rate during 1975-80 shut out many would-be borrowers. Mortgage payments as a proportion of *current* income would have been very high, even if it was not expected to be high relative to *future* income, given high expected future wage growth due to high inflation expectations in the second half of the 1970s. This may have depressed house prices and therefore PI and PR ratios in that period, but even taking this 'constrained liquidity' into account, it still leaves today's ratios looking uncomfortably high, in our opinion.)

Still, the reality is that nominal interest rates are indeed low compared to the past, and houses are a 'long duration asset', in that the benefits of living in a house last for a very long time (indeed, the land on which the house sits on lasts forever, unless taken by the sea in a natural disaster). Long-duration assets will be highly priced in a low rate setting.

## Homeowner costs

A more complete valuation framework, therefore, needs to take into account the benefit of low interest rates. The benefit of tax policies can be substantial too, which in the US allows for mortgage interest payments and state/local property taxes to be deducted from personal tax liabilities. Low rates and tax advantages lower the costs of homeownership and therefore can boost house prices.

As the table below shows, *Home*Pulse takes these and other things into account, such as the level of house prices, the down-payment on the mortgage and home insurance, maintenance and repair costs. Our assumptions, such as a 30% marginal tax rate and a 20% downpayment, should not be too controversial, but *Home*Pulse users can always input their own preferred assumptions.

(One could argue the marginal tax rate should be 0% given that two-thirds of homeowners take the standard deduction on their tax returns, and do not itemize, and therefore the median homeowner does not directly benefit from tax advantages. This makes homeowner costs more expensive relative to the baseline results in *Home*Pulse.)

**4C. Calculating the cost of homeownership**

| | Assumptions |
|---|---|
| House prices | - |
| Rent | - |
| 30-year fixed mortgage rate (%) | 6.3 |
| Downpayment (% home value) | 20 |
| Closing costs (% home value) | 5.0 |
| Opportunity cost (10-y Tsy Yld) | 4.6 |
| Marginal tax rate (%), for: | 30 |
| Tax deductibility of interest payments | |
| Tax deductibility of property tax payments | |
| State & local property tax (% home value)* | 1.4 |
| Home insurance, maintenance & repair (% home value) | 0.5 |
| Holding period (years) | 7 |
| Selling costs (% home value) | 4.0 |
| Long-term rent inflation expectations (%) | 2.5 |

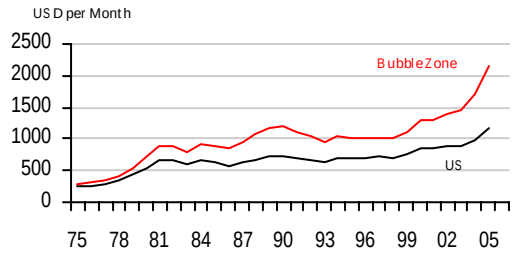
Source: HSBC. *Before federal tax deductibility; post tax cost is 1.0%, consistent with median survey findings of American Housing Survey (2003)

We are now in a position to calculate the annual cost of homeownership. For the US median, it has risen by 66% and for the bubble zone by 124% over the past seven years (since 1998), versus a 43% rise in general inflation as measured by core PCE inflation.

Homeowner costs compared to household income (HOC-I) or to rent (HOC-R) provide more meaningful ways to look at things.

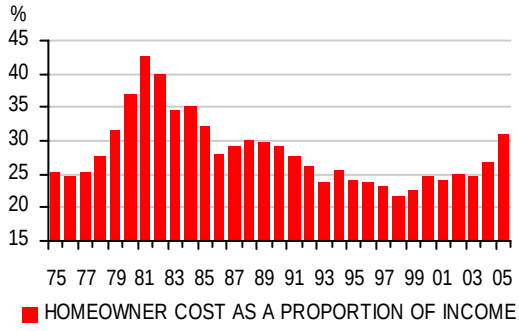
For the US as a whole, annual homeowner costs to income is just as high as it was in the late 1980s (a potential nationwide danger sign), although lower than in the early 1980s. The same applies for homeowner costs to rents.

**4D. Homeowner costs**



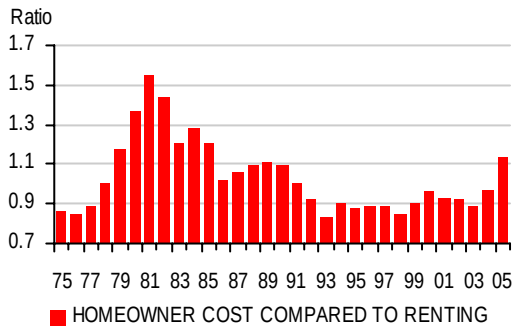

Source: HSBC

**4E. US homeowner costs to income**




Source: HSBC

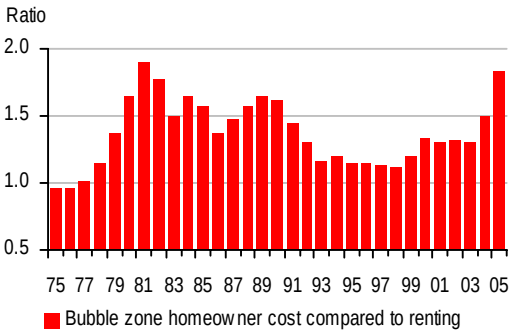
**4F. US homeowner costs to rents**




Source: HSBC

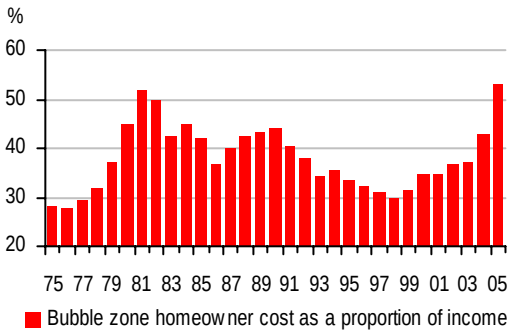
It is, as one might suspect, even worse for the bubble zone. Not only are annual homeowner costs to income or rent higher than in the late 1980s, the ratios are as high as the early 1980s, when 30-year fixed mortgage rates in 1981 were 16.6%. So despite rates being 10 percentage points lower today, these valuations, which adjust for this dramatic decline in interest rates, are still looking dangerously high. Low rates, in other words, cannot explain today's historically high valuations.

**4G. Bubble zone – homeowner costs to rents**




Source: HSBC

**4H. Bubble zone – homeowner costs to income**



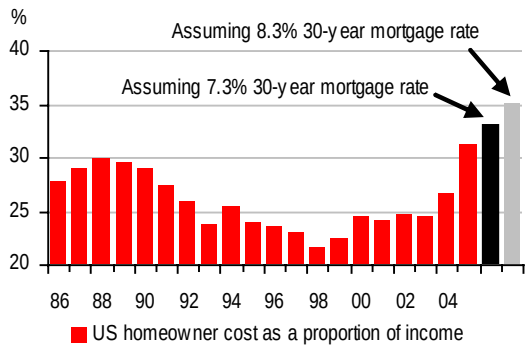

Source: HSBC

We now turn to some scenario analysis of what happens to valuations based on changes in house prices and mortgage rates.

## Scenario analysis

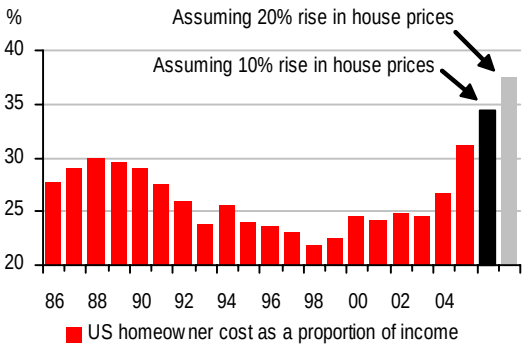
The following charts (homeowner costs to income and homeowner costs to rent) show what happens if we get (1) a 100bp and 200bp rise in mortgage rates, and (2) a further 10% and 20% rise in house prices from here. Obviously, any of these developments only take valuations to even higher levels.

**4I. What happens to HOC-I if rates rise for the US?**



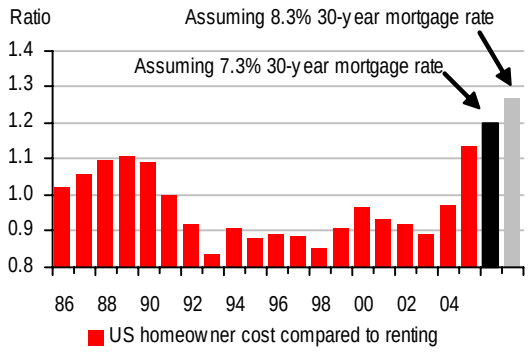

Source: HSBC

**4J. What happens to HOC-I if prices rise for the US?**



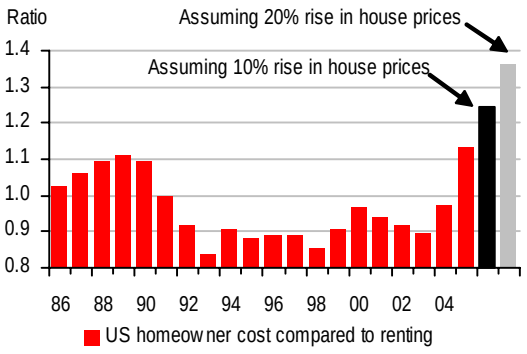

Source: HSBC

**4K. What happens to HOC-R if rates rise for the US?**



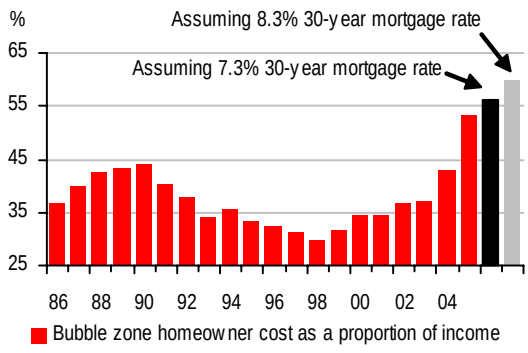

Source: HSBC

**4L. What happens to HOC-R if prices rise for the US?**



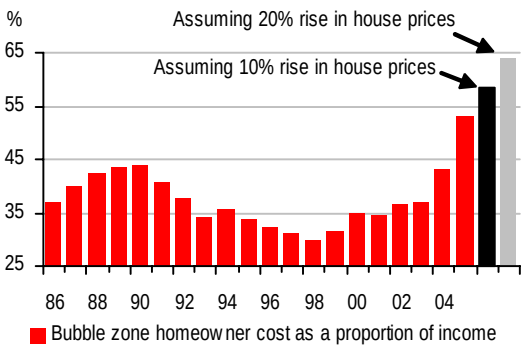

Source: HSBC

**4M. What happens to HOC-I if rates rise for the bubble zone?**




Source: HSBC

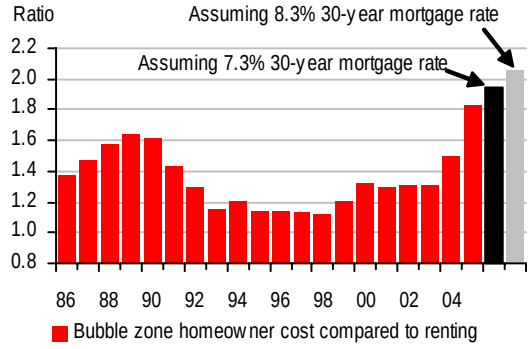
**4N. What happens to HOC-I if prices rise for the bubble zone?**




Source: HSBC

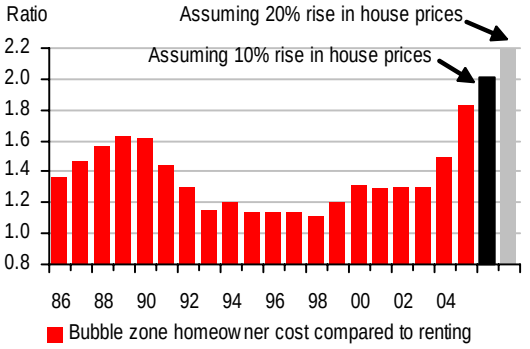
HSBC

**4O. What happens to HOC-R if rates rise for the bubble zone?**




Source: HSBC

**4P. What happens to HOC-R if prices rise for the bubble zone?**




Source: HSBC

## Table guides

On the following pages, tables 4.1 and 4.2 show homeowner costs to income by state and city, while tables 4.3 and 4.4 show homeowner costs to rent for states and cities. For all tables, the 20- and 30-year averages of these valuation ratios are shown, as is 2005Q3's deviation from these averages. Finally, we rank the states and cities respectively by their deviation from their 30-year average.

On this basis, depending on whether one looks at median or average US house prices, homeowner costs to income are 10-16% above 30-year averages and a more worrying 19-25% above 20-year averages. Homeowner costs to rent suggest 9-15% overvaluation for the US, based on the 30-year average, and 18-23% based on the 20-year average.

Homeowner costs to income in the bubble zone are 37% above its 30-year average, 31% above in the eastern bubble and 45% above on the western bubble. DC and California top the list with about 60% deviations.

Homeowner costs to rent in the bubble zone are 32% above its 30-year average, 26% above in the eastern bubble and 39% in the western bubble. California and DC top the list with 44% and 38% deviations, respectively, while by city, Riverside-San Bernardino, CA, Miami, FL and Nassau-Suffolk, NY top the list with 50% deviations from average.

The non-bubble zone is 9% and 4% *undervalued* based on 30-year average homeowner costs to income and rent, respectively. Charlotte, Indianapolis, Memphis, Dallas, Houston, San Antonio and Austin look significantly undervalued on this basis. The emphasis on Texan cities is interesting, given that the prospect of permanently higher energy prices does not appear to have been factored in whatsoever.

HSBC

# 4.1. Homeowner costs to income: states

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| | United States (median) | 31.0 | 25.9 | 19 | 28.3 | 10 |
| | United States (average)* | 38.1 | 30.5 | 25 | 32.8 | 16 |
| | | | | | | |
| | Total Bubble Zone | 52.8 | 37.6 | 40 | 38.4 | 37 |
| | Eastern Bubble Zone | 44.4 | 33.3 | 33 | 34.0 | 31 |
| | Western Bubble Zone | 65.5 | 44.1 | 49 | 45.2 | 45 |
| | Non-Bubble Zone | 25.2 | 24.0 | 5 | 27.8 | -9 |
| | | | | | | |
| **1** | District of Columbia | 52.9 | 33.5 | 58 | 32.1 | **65** |
| **2** | California | 61.0 | 38.7 | 57 | 38.8 | **57** |
| **3** | Massachusetts | 39.7 | 30.5 | 30 | 29.5 | **35** |
| **4** | Rhode Island | 36.6 | 28.1 | 30 | 28.0 | **31** |
| **5** | Oregon | 37.0 | 26.0 | 42 | 28.3 | **30** |
| **6** | New Jersey | 37.3 | 28.3 | 32 | 28.7 | **30** |
| **7** | New York | 38.2 | 30.7 | 24 | 29.4 | **30** |
| **8** | Florida | 34.4 | 24.1 | 43 | 26.9 | **28** |
| **9** | Nevada | 39.3 | 27.9 | 41 | 31.5 | **25** |
| **10** | Hawaii | 64.6 | 51.9 | 24 | 52.4 | **23** |
| **11** | Maryland | 32.3 | 24.5 | 32 | 26.8 | **21** |
| **12** | Delaware | 30.5 | 24.6 | 24 | 25.8 | **18** |
| **13** | Virginia | 29.0 | 22.2 | 31 | 24.9 | **16** |
| **14** | Montana | 28.9 | 22.5 | 29 | 24.9 | **16** |
| **15** | Washington | 33.2 | 27.1 | 22 | 28.6 | **16** |
| **16** | Arizona | 32.6 | 24.3 | 34 | 28.5 | **15** |
| **17** | Maine | 26.5 | 22.2 | 19 | 23.4 | **13** |
| **18** | Michigan | 22.6 | 18.5 | 22 | 20.2 | **12** |
| **19** | Connecticut | 32.9 | 29.0 | 13 | 29.5 | **11** |
| **20** | New Hampshire | 26.4 | 22.4 | 18 | 24.7 | **7** |
| **21** | Illinois | 26.4 | 22.9 | 15 | 24.7 | **7** |
| **22** | Pennsylvania | 22.2 | 20.3 | 9 | 21.7 | **2** |
| **23** | Wisconsin | 22.1 | 18.7 | 19 | 21.7 | **2** |
| **24** | Colorado | 27.9 | 24.4 | 14 | 27.7 | **1** |
| **25** | Vermont | 25.4 | 22.8 | 11 | 25.2 | **1** |
| **26** | Minnesota | 22.0 | 19.4 | 13 | 22.7 | **-3** |
| **27** | Alaska | 25.1 | 22.3 | 13 | 26.7 | **-6** |
| **28** | Wyoming | 20.8 | 18.6 | 12 | 22.8 | **-9** |
| **29** | Georgia | 23.3 | 21.6 | 8 | 25.6 | **-9** |
| **30** | Kentucky | 20.2 | 19.3 | 5 | 22.2 | **-9** |
| **31** | Ohio | 19.6 | 19.2 | 3 | 21.7 | **-9** |
| **32** | Missouri | 18.9 | 18.1 | 5 | 20.9 | **-10** |
| **33** | South Carolina | 21.2 | 19.9 | 6 | 23.8 | **-11** |
| **34** | Kansas | 17.0 | 16.4 | 4 | 19.5 | **-13** |
| **35** | North Carolina | 22.2 | 22.5 | -1 | 25.7 | **-14** |
| **36** | Idaho | 22.4 | 21.9 | 2 | 26.5 | **-15** |
| **37** | South Dakota | 16.8 | 17.0 | -2 | 20.0 | **-16** |
| **38** | New Mexico | 25.1 | 26.3 | -4 | 30.3 | **-17** |
| **39** | Iowa | 15.7 | 15.8 | -1 | 18.9 | **-17** |
| **40** | Indiana | 17.7 | 18.6 | -5 | 21.4 | **-17** |
| **41** | Tennessee | 20.1 | 21.4 | -6 | 24.5 | **-18** |
| **42** | Utah | 23.5 | 22.8 | 3 | 28.6 | **-18** |
| **43** | Nebraska | 16.4 | 16.7 | -2 | 20.0 | **-18** |
| **44** | Alabama | 19.7 | 20.2 | -3 | 24.1 | **-18** |
| **45** | North Dakota | 17.2 | 17.0 | 1 | 21.1 | **-18** |
| **46** | West Virginia | 19.5 | 19.9 | -2 | 23.9 | **-19** |
| **47** | Louisiana | 20.1 | 19.9 | 1 | 24.8 | **-19** |
| **48** | Arkansas | 17.9 | 19.1 | -6 | 23.2 | **-23** |
| **49** | Texas | 16.3 | 17.5 | -7 | 22.1 | **-26** |
| **50** | Oklahoma | 14.9 | 16.6 | -11 | 21.0 | **-29** |
| **51** | Mississippi | 16.5 | 18.9 | -13 | 23.5 | **-30** |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices.

HSBC

# 4.2. Homeowner costs to income: cities

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| 1 | Riverside-San Bernardino-Ontario, CA | 71.4 | 43.2 | 65 | 44.1 | 62 |
| 2 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 73.5 | 46.7 | 58 | 45.5 | 62 |
| 3 | Miami-Miami Beach-Kendall, FL (MSAD) | 56.1 | 33.9 | 66 | 36.1 | 55 |
| 4 | Oakland-Fremont-Hayward, CA (MSAD) | 77.7 | 50.3 | 55 | 50.1 | 55 |
| 5 | Sacramento-Arden-Arcade-Roseville, CA | 52.4 | 32.8 | 60 | 33.8 | 55 |
| 6 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 90.9 | 57.7 | 57 | 58.9 | 54 |
| 7 | Nassau-Suffolk, NY (MSAD) | 50.7 | 35.1 | 45 | 33.3 | 53 |
| 8 | San Diego-Carlsbad-San Marcos, CA | 78.6 | 50.7 | 55 | 51.7 | 52 |
| 9 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 75.8 | 55.3 | 37 | 53.7 | 41 |
| 10 | New York-Wayne-White Plains, NY-NJ (MSAD) | 59.5 | 44.1 | 35 | 42.6 | 40 |
| 11 | Providence-New Bedford-Fall River, RI-MA | 43.8 | 33.0 | 33 | 32.3 | 35 |
| 12 | Honolulu, HI | 68.0 | 51.3 | 33 | 50.5 | 35 |
| 13 | Edison, NJ (MSAD) | 44.6 | 33.5 | 33 | 33.7 | 32 |
| 14 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 42.8 | 30.7 | 39 | 32.6 | 31 |
| 15 | Palm Bay-Melbourne-Titusville, FL | 30.0 | 20.1 | 49 | 23.2 | 30 |
| 16 | Portland-Vancouver-Beaverton, OR-WA | 33.9 | 25.1 | 35 | 26.7 | 27 |
| 17 | Boston-Quincy, MA (MSAD) | 46.3 | 36.6 | 26 | 36.8 | 26 |
| 18 | Phoenix-Mesa-Scottdale, AZ | 31.6 | 22.1 | 43 | 25.2 | 26 |
| 19 | Las Vegas-Paradise, NV | 48.5 | 33.5 | 45 | 38.6 | 25 |
| 20 | Newark-Union, NJ-PA (MSAD) | 47.2 | 37.9 | 24 | 38.2 | 24 |
| 21 | Tampa-St. Petersburg-Clearwater, FL | 32.8 | 23.3 | 41 | 26.6 | 23 |
| 22 | Orlando, FL | 33.0 | 23.9 | 38 | 27.2 | 21 |
| 23 | Seattle-Bellevue-Everett, WA (MSAD) | 40.5 | 32.8 | 24 | 33.7 | 20 |
| 24 | Baltimore-Towson, MD | 33.9 | 26.3 | 29 | 28.3 | 20 |
| 25 | Tucson, AZ | 37.1 | 27.9 | 33 | 31.1 | 20 |
| 26 | Virginia Beach-Norfolk-Newport News, VA-NC | 27.9 | 21.7 | 29 | 23.8 | 17 |
| 27 | Chicago-Naperville-Joliet, IL (MSAD) | 33.0 | 27.0 | 22 | 28.4 | 16 |
| 28 | Minneapolis-St. Paul-Bloomington, MN-WI | 26.3 | 20.9 | 26 | 23.6 | 11 |
| 29 | Philadelphia, PA (MSAD) | 26.5 | 22.8 | 16 | 23.9 | 11 |
| 30 | Detroit-Livonia-Dearborn, MI (MSAD) | 20.3 | 17.8 | 14 | 18.4 | 10 |
| 31 | Charleston-North Charleston, SC | 31.7 | 25.6 | 24 | 28.8 | 10 |
| 32 | New Haven-Milford, CT | 36.7 | 32.6 | 12 | 33.8 | 8 |
| 33 | Bridgeport-Stamford-Norwalk, CT | 38.1 | 34.0 | 12 | 36.4 | 5 |
| 34 | Milwaukee-Waukesha-West Allis, WI | 28.6 | 24.9 | 15 | 27.9 | 2 |
| 35 | Denver-Aurora, CO | 29.0 | 25.6 | 13 | 28.8 | 1 |
| 36 | Hartford-West Hartford-East Hartford, CT | 30.1 | 28.6 | 5 | 30.5 | -2 |
| 37 | Salt Lake City, UT | 21.3 | 20.0 | 6 | 22.2 | -4 |
| 38 | Colorado Springs, CO | 26.2 | 24.1 | 9 | 27.4 | -4 |
| 39 | St. Louis, MO-IL | 18.9 | 17.7 | 7 | 20.1 | -6 |
| 40 | Atlanta-Sandy Springs-Marietta, GA | 20.4 | 19.4 | 5 | 22.2 | -8 |
| 41 | Cleveland-Elyria-Mentor, OH | 20.9 | 20.5 | 2 | 22.9 | -9 |
| 42 | Cedar Rapids, IA | 17.8 | 18.7 | -5 | 19.6 | -9 |
| 43 | Albuquerque, NM | 24.8 | 24.6 | 1 | 28.2 | -12 |
| 44 | Kansas City, MO-KS | 21.0 | 20.3 | 3 | 23.9 | -12 |
| 45 | Columbus, OH | 20.7 | 21.0 | -2 | 23.9 | -13 |
| 46 | Greensboro-High Point, NC | 22.8 | 23.5 | -3 | 26.7 | -14 |
| 47 | Pittsburgh, PA | 19.1 | 19.6 | -3 | 22.4 | -15 |
| 48 | Buffalo-Niagara Falls, NY | 15.7 | 17.1 | -8 | 18.5 | -15 |
| 49 | New Orleans-Metairie-Kenner, LA | 23.8 | 22.9 | 4 | 28.1 | -15 |
| 50 | Cincinnati-Middletown, OH-KY-IN | 20.2 | 20.7 | -3 | 23.8 | -15 |
| 51 | Nashville-Davidson-Murfreesboro, TN | 20.9 | 21.6 | -3 | 24.7 | -16 |
| 52 | Omaha-Council Bluffs, NE-IA | 18.8 | 19.0 | -1 | 22.4 | -16 |
| 53 | Austin-Round Rock, TX | 22.8 | 22.7 | 0 | 27.2 | -16 |
| 54 | Charlotte-Gastonia-Concord, NC-SC | 23.8 | 25.2 | -5 | 29.0 | -18 |
| 55 | Indianapolis, IN | 17.0 | 18.3 | -7 | 21.0 | -19 |
| 56 | Memphis, TN-MS-AR | 21.3 | 24.3 | -12 | 28.8 | -26 |
| 57 | Dallas-Plano-Irving, TX (MSAD) | 19.3 | 21.1 | -8 | 26.0 | -26 |
| 58 | Houston-Baytown-Sugar Land, TX | 19.6 | 20.8 | -6 | 27.0 | -27 |
| 59 | San Antonio, TX | 21.0 | 22.7 | -7 | 29.0 | -28 |

Source: HSBC

HSBC

# 4.3. Homeowner costs to rent: states

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| | United States (median) | 1.13 | 0.96 | 18 | 1.04 | 9 |
| | United States (average)* | 1.39 | 1.13 | 23 | 1.21 | 15 |
| | | | | | | |
| | Total Bubble Zone | 1.83 | 1.35 | 35 | 1.39 | 32 |
| | Eastern Bubble Zone | 1.58 | 1.23 | 28 | 1.25 | 26 |
| | Western Bubble Zone | 2.20 | 1.53 | 44 | 1.58 | 39 |
| | Non-Bubble Zone | 1.07 | 1.00 | 7 | 1.11 | -4 |
| | | | | | | |
| **1** | California | 1.87 | 1.26 | 48 | 1.30 | **44** |
| **2** | District of Columbia | 1.38 | 0.91 | 51 | 1.00 | **38** |
| **3** | Maryland | 1.50 | 1.12 | 34 | 1.16 | **30** |
| **4** | Rhode Island | 1.40 | 1.06 | 32 | 1.09 | **29** |
| **5** | Florida | 1.21 | 0.85 | 42 | 0.94 | **29** |
| **6** | Oregon | 1.48 | 1.08 | 37 | 1.15 | **28** |
| **7** | Montana | 1.17 | 0.86 | 36 | 0.92 | **28** |
| **8** | Massachusetts | 1.26 | 1.03 | 23 | 0.99 | **27** |
| **9** | Washington | 1.46 | 1.13 | 29 | 1.15 | **27** |
| **10** | Nevada | 1.46 | 1.01 | 45 | 1.17 | **26** |
| **11** | Hawaii | 2.21 | 1.73 | 27 | 1.76 | **26** |
| **12** | Arizona | 1.28 | 0.93 | 38 | 1.03 | **24** |
| **13** | New Jersey | 1.34 | 1.06 | 27 | 1.08 | **23** |
| **14** | Maine | 0.97 | 0.78 | 23 | 0.78 | **23** |
| **15** | Virginia | 1.39 | 1.12 | 25 | 1.13 | **23** |
| **16** | Vermont | 0.99 | 0.80 | 24 | 0.81 | **22** |
| **17** | Delaware | 1.26 | 1.04 | 22 | 1.06 | **19** |
| **18** | New York | 1.15 | 1.00 | 14 | 1.00 | **15** |
| **19** | Illinois | 1.02 | 0.85 | 19 | 0.89 | **15** |
| **20** | Wyoming | 1.05 | 0.78 | 34 | 0.93 | **13** |
| **21** | Minnesota | 1.00 | 0.83 | 21 | 0.90 | **12** |
| **22** | New Hampshire | 1.04 | 0.90 | 16 | 0.93 | **12** |
| **23** | Colorado | 1.19 | 1.02 | 17 | 1.09 | **10** |
| **24** | Wisconsin | 1.05 | 0.90 | 17 | 0.97 | **8** |
| **25** | Connecticut | 1.28 | 1.14 | 12 | 1.19 | **7** |
| **26** | Michigan | 0.90 | 0.81 | 12 | 0.85 | **7** |
| **27** | Pennsylvania | 0.91 | 0.82 | 11 | 0.86 | **6** |
| **28** | Utah | 1.26 | 1.13 | 12 | 1.21 | **4** |
| **29** | Alaska | 1.06 | 0.94 | 13 | 1.03 | **2** |
| **30** | Kentucky | 0.89 | 0.81 | 9 | 0.87 | **2** |
| **31** | South Dakota | 0.77 | 0.70 | 11 | 0.77 | **1** |
| **32** | North Dakota | 0.84 | 0.72 | 18 | 0.84 | **0** |
| **33** | Idaho | 1.08 | 0.96 | 12 | 1.08 | **-1** |
| **34** | West Virginia | 0.86 | 0.79 | 9 | 0.89 | **-4** |
| **35** | Iowa | 0.76 | 0.69 | 9 | 0.79 | **-5** |
| **36** | South Carolina | 0.92 | 0.88 | 4 | 0.96 | **-5** |
| **37** | New Mexico | 1.02 | 0.92 | 11 | 1.08 | **-5** |
| **38** | Tennessee | 0.87 | 0.85 | 2 | 0.92 | **-6** |
| **39** | Georgia | 0.88 | 0.85 | 4 | 0.95 | **-7** |
| **40** | Missouri | 0.82 | 0.80 | 2 | 0.88 | **-7** |
| **41** | Alabama | 0.88 | 0.86 | 2 | 0.96 | **-8** |
| **42** | Ohio | 0.90 | 0.90 | 1 | 0.99 | **-9** |
| **43** | Kansas | 0.79 | 0.73 | 9 | 0.88 | **-10** |
| **44** | Nebraska | 0.76 | 0.75 | 2 | 0.85 | **-11** |
| **45** | Oklahoma | 0.70 | 0.67 | 6 | 0.80 | **-12** |
| **46** | North Carolina | 0.90 | 0.95 | -5 | 1.02 | **-12** |
| **47** | Arkansas | 0.77 | 0.75 | 3 | 0.88 | **-13** |
| **48** | Indiana | 0.79 | 0.81 | -3 | 0.91 | **-13** |
| **49** | Louisiana | 0.83 | 0.78 | 6 | 0.96 | **-14** |
| **50** | Mississippi | 0.66 | 0.68 | -4 | 0.77 | **-15** |
| **51** | Texas | 0.66 | 0.71 | -7 | 0.89 | **-26** |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices.

HSBC

# 4.4. Homeowner costs to rent: cities

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| 1 | Riverside-San Bernardino-Ontario, CA | 2.19 | 1.36 | 61 | 1.43 | 54 |
| 2 | Miami-Miami Beach-Kendall, FL (MSAD) | 1.84 | 1.15 | 60 | 1.21 | 52 |
| 3 | Nassau-Suffolk, NY (MSAD) | 1.71 | 1.22 | 41 | 1.17 | 47 |
| 4 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 2.17 | 1.55 | 40 | 1.55 | 40 |
| 5 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 2.72 | 1.82 | 49 | 1.94 | 40 |
| 6 | Palm Bay-Melbourne-Titusville, FL | 1.38 | 0.90 | 55 | 0.99 | 39 |
| 7 | San Diego-Carlsbad-San Marcos, CA | 2.57 | 1.80 | 43 | 1.86 | 38 |
| 8 | Oakland-Fremont-Hayward, CA (MSAD) | 2.80 | 1.96 | 43 | 2.04 | 37 |
| 9 | Seattle-Bellevue-Everett, WA (MSAD) | 1.78 | 1.33 | 34 | 1.31 | 36 |
| 10 | Sacramento-Arden-Arcade-Roseville, CA | 1.92 | 1.37 | 40 | 1.43 | 34 |
| 11 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 2.20 | 1.65 | 34 | 1.69 | 30 |
| 12 | Providence-New Bedford-Fall River, RI-MA | 1.65 | 1.26 | 31 | 1.27 | 29 |
| 13 | Baltimore-Towson, MD | 1.38 | 1.04 | 32 | 1.09 | 27 |
| 14 | Portland-Vancouver-Beaverton, OR-WA | 1.54 | 1.15 | 34 | 1.22 | 26 |
| 15 | New York-Wayne-White Plains, NY-NJ (MSAD) | 2.03 | 1.66 | 22 | 1.60 | 26 |
| 16 | Phoenix-Mesa-Scottdale, AZ | 1.33 | 0.95 | 41 | 1.06 | 26 |
| 17 | Boston-Quincy, MA (MSAD) | 1.48 | 1.18 | 25 | 1.18 | 26 |
| 18 | Newark-Union, NJ-PA (MSAD) | 2.01 | 1.57 | 27 | 1.60 | 25 |
| 19 | Tucson, AZ | 1.50 | 1.08 | 38 | 1.19 | 25 |
| 20 | Chicago-Naperville-Joliet, IL (MSAD) | 1.38 | 1.10 | 25 | 1.12 | 24 |
| 21 | Charleston-North Charleston, SC | 1.49 | 1.15 | 29 | 1.23 | 21 |
| 22 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 1.70 | 1.26 | 35 | 1.40 | 21 |
| 23 | Virginia Beach-Norfolk-Newport News, VA-NC | 1.23 | 0.97 | 26 | 1.03 | 20 |
| 24 | Edison, NJ (MSAD) | 1.40 | 1.14 | 23 | 1.18 | 19 |
| 25 | Las Vegas-Paradise, NV | 1.69 | 1.19 | 42 | 1.42 | 19 |
| 26 | Honolulu, HI | 2.34 | 1.93 | 21 | 1.97 | 19 |
| 27 | Tampa-St. Petersburg-Clearwater, FL | 1.16 | 0.88 | 32 | 0.99 | 18 |
| 28 | Bridgeport-Stamford-Norwalk, CT | 2.37 | 1.99 | 19 | 2.06 | 15 |
| 29 | Philadelphia, PA (MSAD) | 1.10 | 0.93 | 18 | 0.98 | 13 |
| 30 | Orlando, FL | 1.20 | 0.94 | 28 | 1.06 | 13 |
| 31 | Minneapolis-St. Paul-Bloomington, MN-WI | 1.20 | 0.98 | 22 | 1.06 | 13 |
| 32 | Denver-Aurora, CO | 1.32 | 1.12 | 18 | 1.18 | 11 |
| 33 | New Haven-Milford, CT | 1.40 | 1.18 | 18 | 1.26 | 11 |
| 34 | Milwaukee-Waukesha-West Allis, WI | 1.40 | 1.17 | 19 | 1.27 | 10 |
| 35 | Salt Lake City, UT | 1.21 | 1.05 | 15 | 1.11 | 9 |
| 36 | Detroit-Livonia-Dearborn, MI (MSAD) | 0.96 | 0.86 | 12 | 0.90 | 7 |
| 37 | Nashville-Davidson-Murfreesboro, TN | 1.07 | 0.99 | 9 | 1.06 | 1 |
| 38 | Cedar Rapids, IA | 1.01 | 0.98 | 3 | 1.01 | 1 |
| 39 | Hartford-West Hartford-East Hartford, CT | 1.32 | 1.26 | 4 | 1.34 | -2 |
| 40 | Albuquerque, NM | 1.12 | 1.06 | 6 | 1.18 | -6 |
| 41 | Colorado Springs, CO | 1.22 | 1.15 | 6 | 1.30 | -6 |
| 42 | St. Louis, MO-IL | 0.88 | 0.87 | 1 | 0.95 | -7 |
| 43 | Kansas City, MO-KS | 1.08 | 1.03 | 4 | 1.17 | -8 |
| 44 | Pittsburgh, PA | 0.83 | 0.85 | -3 | 0.90 | -8 |
| 45 | Buffalo-Niagara Falls, NY | 0.73 | 0.78 | -6 | 0.80 | -8 |
| 46 | Columbus, OH | 1.05 | 1.04 | 1 | 1.15 | -9 |
| 47 | Atlanta-Sandy Springs-Marietta, GA | 0.93 | 0.90 | 3 | 1.02 | -9 |
| 48 | Cleveland-Elyria-Mentor, OH | 0.95 | 0.96 | -1 | 1.06 | -11 |
| 49 | Omaha-Council Bluffs, NE-IA | 0.94 | 0.94 | 1 | 1.07 | -12 |
| 50 | New Orleans-Metairie-Kenner, LA | 0.98 | 0.93 | 6 | 1.13 | -13 |
| 51 | Cincinnati-Middletown, OH-KY-IN | 1.03 | 1.05 | -2 | 1.18 | -13 |
| 52 | Indianapolis, IN | 0.85 | 0.91 | -7 | 1.02 | -17 |
| 53 | Charlotte-Gastonia-Concord, NC-SC | 1.07 | 1.23 | -13 | 1.30 | -17 |
| 54 | Greensboro-High Point, NC | 1.03 | 1.15 | -11 | 1.26 | -18 |
| 55 | Austin-Round Rock, TX | 0.84 | 0.89 | -6 | 1.04 | -19 |
| 56 | Memphis, TN-MS-AR | 1.01 | 1.12 | -10 | 1.26 | -20 |
| 57 | San Antonio, TX | 0.87 | 0.94 | -7 | 1.16 | -24 |
| 58 | Houston-Baytown-Sugar Land, TX | 0.91 | 0.95 | -4 | 1.22 | -26 |
| 59 | Dallas-Plano-Irving, TX (MSAD) | 0.78 | 0.92 | -16 | 1.17 | -33 |

Source: HSBC

HSBC

# 5. Future expectations

- The average holding period of a house is roughly seven years
- The expected cost of homeownership for that period…
- …compared to the expected cost of renting looks very high

## Rational expectations

One could argue valuations are even more extreme today than what annual homeowner costs in section 4 shows.

The reason is that when you buy a house to live in, you don't buy a house for one year, but instead expect to live in it for a reasonably long time.

An approach that takes account of these rational expectations, therefore, is to compare expected future homeowner costs for the expected holding period of the home (relatively easy to calculate if using a fixed rate mortgage), versus the expected cost of renting a similar house over the same time period.

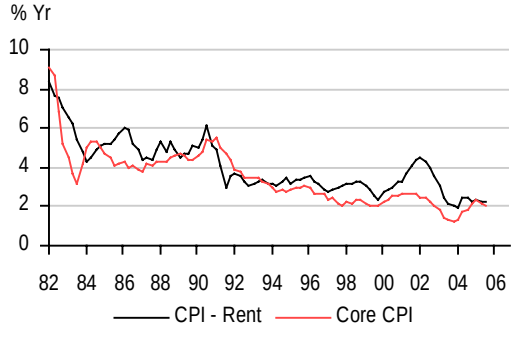
Using a fixed mortgage rate, homeowner costs are relatively fixed (although taxes, insurance, etc. will be a proportion of the value of the house or rise in line with inflation). Rents, meanwhile, will rise by about the same rate as general CPI inflation (usually a bit more).

Given that inflation expectations are lower today than in the 1970s, 1980s and even the 1990s, rent inflation is not expected to rise as quickly going forward compared to past decades.

So even though mortgage rates were high in the past, it may have made sense to buy versus rent because if you rented in 1980, you would have expected your rent to rise by about 8% per year, which, due to compounding, gets pretty expensive pretty quickly.

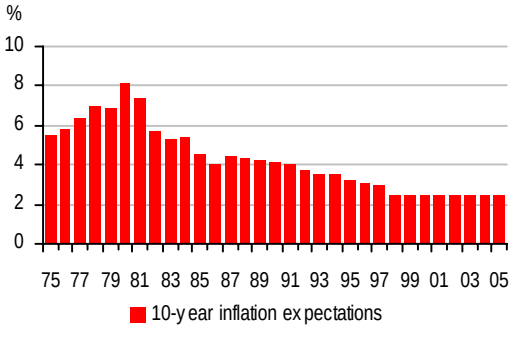
Today, with inflation expectations at 2½%, it may be better to rent for the next few years rather than buy an expensive home now (despite low rates).

**5A. Rent inflation tracks core CPI over the long run**




Source: BLS

**5B. Long-term inflation expectations are low**




Source: Philadelphia Federal Reserve, Survey of Professional Forecasters, 1975-78 is 5-year average of core PCE inflation

We need to weigh the positive impact of low rates with the negative impact of low future rental inflation when assessing future homeowner costs to future rent.

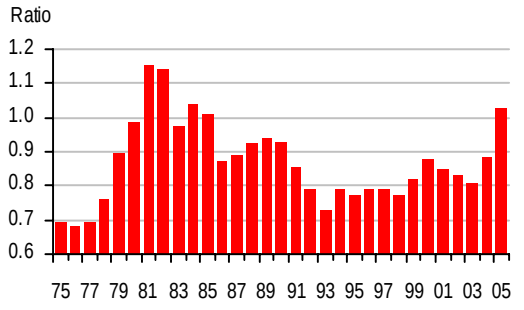
Assume seven years for the expected holding period of the home, which is about the US average currently. Chart 5C looks at expected future homeowner costs compared to expected future rents (F-HOC-R), where future rents are calculated using long-term inflation expectations. The ratio is higher than the late 1980s, and not that far off the record high reached in 1981-1982.

One can see from chart 5D that future homeowner costs to future rents (F HOC-R) in the 'bubble zone' are significantly higher in 2005 than in either the late 1980s or the early 1980s too when mortgage rates were over 16%.

Based on F HOC-R, the bubble zone housing market is the most overvalued it has ever been, even after adjusting for low interest rates.

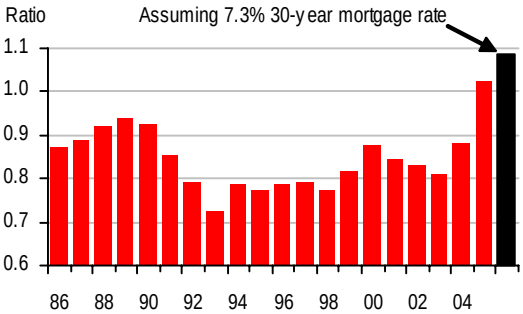
A 100bp rise in mortgage rates would take the US F HOC-R ratio to 1.1 (chart 5E), close to the historical highs seen in 1981-1982, highlighting once again the vulnerability of house prices from a relatively moderate rise in rates, while for the bubble zone, the ratio goes further into the stratosphere (chart 5F).

**5C. US F HOC-R**



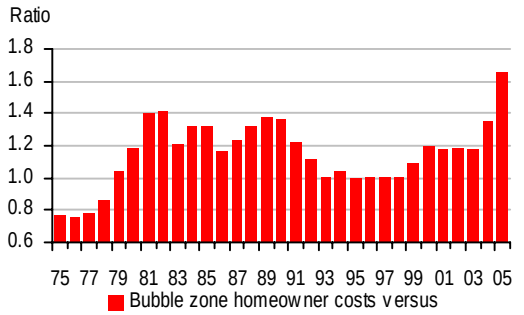

Source: HSBC

**5E. US F HOC-R if rates rise 100bp**



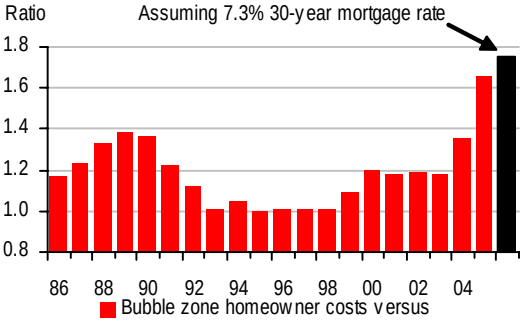

Source: HSBC

**5D. Bubble zone F-HOC R**




Source: HSBC

**5F. Bubble zone F-HOC R if rates rise 100bp**




Source: HSBC

HSBC

## Table guide

Tables 5.1 and 5.2 show how the expected future homeowner costs for the next seven years compare to the expected cost of renting for the next seven years. We chose seven years as it is roughly the US average holding period of a home. However, *Home*Pulse users can change this assumption.

The tables show the F HOC-R ratio for 2005Q3, the 20- and 30-year averages and the deviation of 2005Q3 from the 20- and 30-year averages. We rank the states and cities respectively by their deviation from their 30-year averages.

Based on 2005Q3's deviation from 30-year averages, it suggests the US as a whole may be 17-24% overvalued, depending on whether one looks at median or average US house prices. The deviations from 20-year averages are somewhat more, at 21-27%.

The bubble-zone 30-year deviation is 42% (35% for the eastern bubble and 49% for the western), while the non-bubble zone is just 4% above its 30-year average, suggesting current prices are at approximately fair value.

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# 5.1. Future homeowner costs to expected future rent: states

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| | United States (median) | 1.03 | 0.85 | 21 | 0.88 | 17 |
| | United States (average)* | 1.26 | 0.99 | 27 | 1.02 | 24 |
| | | | | | | |
| | Total Bubble Zone | 1.66 | 1.19 | 40 | 1.17 | 42 |
| | Eastern Bubble Zone | 1.43 | 1.08 | 32 | 1.05 | 35 |
| | Western Bubble Zone | 1.99 | 1.35 | 48 | 1.33 | 49 |
| | Non-Bubble Zone | 0.97 | 0.88 | 10 | 0.93 | 4 |
| | | | | | | |
| **1** | California | 1.70 | 1.11 | 53 | 1.09 | **55** |
| **2** | District of Columbia | 1.25 | 0.80 | 56 | 0.84 | **49** |
| **3** | Maryland | 1.36 | 0.98 | 38 | 0.98 | **39** |
| **4** | Florida | 1.09 | 0.75 | 46 | 0.79 | **39** |
| **5** | Rhode Island | 1.27 | 0.93 | 36 | 0.92 | **38** |
| **6** | Oregon | 1.34 | 0.95 | 41 | 0.97 | **38** |
| **7** | Montana | 1.06 | 0.76 | 40 | 0.77 | **37** |
| **8** | Nevada | 1.33 | 0.89 | 49 | 0.98 | **36** |
| **9** | Washington | 1.32 | 1.00 | 33 | 0.97 | **36** |
| **10** | Massachusetts | 1.14 | 0.90 | 26 | 0.84 | **35** |
| **11** | Hawaii | 2.00 | 1.52 | 32 | 1.48 | **35** |
| **12** | Arizona | 1.16 | 0.81 | 42 | 0.86 | **34** |
| **13** | New Jersey | 1.21 | 0.93 | 31 | 0.91 | **33** |
| **14** | Maine | 0.87 | 0.69 | 27 | 0.66 | **32** |
| **15** | Virginia | 1.26 | 0.98 | 29 | 0.95 | **32** |
| **16** | Vermont | 0.90 | 0.70 | 28 | 0.68 | **31** |
| **17** | Delaware | 1.14 | 0.91 | 26 | 0.90 | **28** |
| **18** | Illinois | 0.92 | 0.75 | 23 | 0.75 | **23** |
| **19** | New York | 1.04 | 0.88 | 18 | 0.84 | **23** |
| **20** | Wyoming | 0.95 | 0.69 | 37 | 0.78 | **22** |
| **21** | Minnesota | 0.91 | 0.73 | 25 | 0.75 | **21** |
| **22** | New Hampshire | 0.94 | 0.79 | 19 | 0.79 | **20** |
| **23** | Colorado | 1.08 | 0.90 | 21 | 0.92 | **18** |
| **24** | Wisconsin | 0.95 | 0.79 | 20 | 0.81 | **17** |
| **25** | Connecticut | 1.16 | 1.00 | 16 | 1.00 | **16** |
| **26** | Michigan | 0.82 | 0.71 | 15 | 0.71 | **15** |
| **27** | Pennsylvania | 0.82 | 0.71 | 15 | 0.72 | **14** |
| **28** | Utah | 1.14 | 0.99 | 15 | 1.01 | **12** |
| **29** | Alaska | 0.96 | 0.82 | 16 | 0.87 | **10** |
| **30** | Kentucky | 0.80 | 0.71 | 13 | 0.73 | **10** |
| **31** | North Dakota | 0.76 | 0.63 | 21 | 0.70 | **9** |
| **32** | South Dakota | 0.70 | 0.61 | 14 | 0.64 | **9** |
| **33** | Idaho | 0.97 | 0.84 | 15 | 0.91 | **7** |
| **34** | West Virginia | 0.77 | 0.69 | 12 | 0.74 | **4** |
| **35** | Iowa | 0.68 | 0.61 | 12 | 0.66 | **3** |
| **36** | South Carolina | 0.83 | 0.77 | 7 | 0.81 | **3** |
| **37** | New Mexico | 0.93 | 0.81 | 15 | 0.90 | **2** |
| **38** | Tennessee | 0.79 | 0.74 | 5 | 0.77 | **2** |
| **39** | Georgia | 0.80 | 0.74 | 7 | 0.79 | **0** |
| **40** | Missouri | 0.74 | 0.70 | 5 | 0.74 | **0** |
| **41** | Alabama | 0.80 | 0.76 | 6 | 0.81 | **-1** |
| **42** | Ohio | 0.82 | 0.79 | 4 | 0.83 | **-2** |
| **43** | Kansas | 0.72 | 0.64 | 12 | 0.73 | **-2** |
| **44** | Nebraska | 0.69 | 0.66 | 5 | 0.71 | **-4** |
| **45** | Oklahoma | 0.64 | 0.59 | 9 | 0.67 | **-4** |
| **46** | North Carolina | 0.81 | 0.83 | -2 | 0.85 | **-5** |
| **47** | Arkansas | 0.70 | 0.65 | 7 | 0.74 | **-5** |
| **48** | Louisiana | 0.75 | 0.69 | 9 | 0.80 | **-6** |
| **49** | Indiana | 0.71 | 0.71 | 0 | 0.76 | **-6** |
| **50** | Mississippi | 0.60 | 0.60 | -1 | 0.65 | **-8** |
| **51** | Texas | 0.59 | 0.62 | -4 | 0.74 | **-20** |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices. Assumes seven year holding period

HSBC

# 5.2. Future homeowner costs to expected future rent: cities

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| 1 | Riverside-San Bernardino-Ontario, CA | 1.98 | 1.20 | 66 | 1.20 | 65 |
| 2 | Miami-Miami Beach-Kendall, FL (MSAD) | 1.66 | 1.01 | 65 | 1.02 | 63 |
| 3 | Nassau-Suffolk, NY (MSAD) | 1.55 | 1.07 | 45 | 0.99 | 57 |
| 4 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 2.46 | 1.60 | 54 | 1.63 | 51 |
| 5 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 1.97 | 1.36 | 44 | 1.31 | 50 |
| 6 | Palm Bay-Melbourne-Titusville, FL | 1.25 | 0.79 | 59 | 0.84 | 48 |
| 7 | San Diego-Carlsbad-San Marcos, CA | 2.32 | 1.58 | 47 | 1.57 | 48 |
| 8 | Oakland-Fremont-Hayward, CA (MSAD) | 2.53 | 1.72 | 47 | 1.72 | 48 |
| 9 | Seattle-Bellevue-Everett, WA (MSAD) | 1.61 | 1.17 | 37 | 1.11 | 45 |
| 10 | Sacramento-Arden-Arcade-Roseville, CA | 1.73 | 1.20 | 44 | 1.21 | 44 |
| 11 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 1.99 | 1.45 | 38 | 1.42 | 40 |
| 12 | Providence-New Bedford-Fall River, RI-MA | 1.49 | 1.10 | 35 | 1.08 | 39 |
| 13 | Baltimore-Towson, MD | 1.25 | 0.91 | 37 | 0.92 | 36 |
| 14 | Portland-Vancouver-Beaverton, OR-WA | 1.39 | 1.01 | 37 | 1.03 | 36 |
| 15 | Phoenix-Mesa-Scottdale, AZ | 1.21 | 0.83 | 45 | 0.89 | 35 |
| 16 | New York-Wayne-White Plains, NY-NJ (MSAD) | 1.83 | 1.45 | 26 | 1.36 | 35 |
| 17 | Tucson, AZ | 1.35 | 0.95 | 42 | 1.00 | 35 |
| 18 | Newark-Union, NJ-PA (MSAD) | 1.81 | 1.38 | 32 | 1.35 | 35 |
| 19 | Boston-Quincy, MA (MSAD) | 1.34 | 1.04 | 29 | 1.00 | 33 |
| 20 | Chicago-Naperville-Joliet, IL (MSAD) | 1.25 | 0.97 | 29 | 0.94 | 33 |
| 21 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 1.54 | 1.10 | 39 | 1.18 | 31 |
| 22 | Charleston-North Charleston, SC | 1.35 | 1.01 | 33 | 1.04 | 29 |
| 23 | Virginia Beach-Norfolk-Newport News, VA-NC | 1.11 | 0.85 | 30 | 0.86 | 28 |
| 24 | Las Vegas-Paradise, NV | 1.53 | 1.05 | 46 | 1.19 | 28 |
| 25 | Edison, NJ (MSAD) | 1.27 | 1.00 | 27 | 0.99 | 28 |
| 26 | Honolulu, HI | 2.12 | 1.69 | 25 | 1.66 | 27 |
| 27 | Tampa-St. Petersburg-Clearwater, FL | 1.05 | 0.78 | 36 | 0.83 | 27 |
| 28 | Bridgeport-Stamford-Norwalk, CT | 2.14 | 1.75 | 23 | 1.74 | 23 |
| 29 | Philadelphia, PA (MSAD) | 1.00 | 0.82 | 22 | 0.82 | 22 |
| 30 | Orlando, FL | 1.08 | 0.82 | 32 | 0.89 | 22 |
| 31 | Minneapolis-St. Paul-Bloomington, MN-WI | 1.08 | 0.86 | 25 | 0.89 | 21 |
| 32 | Denver-Aurora, CO | 1.19 | 0.98 | 21 | 1.00 | 20 |
| 33 | Milwaukee-Waukesha-West Allis, WI | 1.27 | 1.03 | 23 | 1.07 | 19 |
| 34 | New Haven-Milford, CT | 1.26 | 1.04 | 22 | 1.06 | 19 |
| 35 | Salt Lake City, UT | 1.09 | 0.92 | 18 | 0.93 | 17 |
| 36 | Detroit-Livonia-Dearborn, MI (MSAD) | 0.87 | 0.76 | 15 | 0.75 | 15 |
| 37 | Nashville-Davidson-Murfreesboro, TN | 0.97 | 0.87 | 12 | 0.90 | 8 |
| 38 | Hartford-West Hartford-East Hartford, CT | 1.19 | 1.10 | 8 | 1.13 | 5 |
| 39 | Cedar Rapids, IA | 0.92 | 0.86 | 6 | 0.88 | 5 |
| 40 | Albuquerque, NM | 1.01 | 0.93 | 9 | 0.99 | 2 |
| 41 | St. Louis, MO-IL | 0.80 | 0.77 | 4 | 0.80 | 0 |
| 42 | Colorado Springs, CO | 1.10 | 1.01 | 9 | 1.10 | 0 |
| 43 | Kansas City, MO-KS | 0.97 | 0.91 | 8 | 0.98 | 0 |
| 44 | Pittsburgh, PA | 0.75 | 0.75 | 0 | 0.76 | -1 |
| 45 | Columbus, OH | 0.95 | 0.91 | 4 | 0.97 | -1 |
| 46 | Atlanta-Sandy Springs-Marietta, GA | 0.84 | 0.79 | 6 | 0.86 | -2 |
| 47 | Buffalo-Niagara Falls, NY | 0.66 | 0.68 | -3 | 0.68 | -2 |
| 48 | Cleveland-Elyria-Mentor, OH | 0.86 | 0.84 | 2 | 0.89 | -4 |
| 49 | Omaha-Council Bluffs, NE-IA | 0.85 | 0.82 | 4 | 0.90 | -5 |
| 50 | New Orleans-Metairie-Kenner, LA | 0.89 | 0.82 | 9 | 0.94 | -6 |
| 51 | Cincinnati-Middletown, OH-KY-IN | 0.93 | 0.92 | 1 | 0.99 | -6 |
| 52 | Indianapolis, IN | 0.77 | 0.80 | -4 | 0.85 | -10 |
| 53 | Charlotte-Gastonia-Concord, NC-SC | 0.97 | 1.07 | -10 | 1.09 | -11 |
| 54 | Greensboro-High Point, NC | 0.93 | 1.01 | -8 | 1.06 | -12 |
| 55 | Austin-Round Rock, TX | 0.76 | 0.78 | -3 | 0.87 | -12 |
| 56 | Memphis, TN-MS-AR | 0.91 | 0.98 | -7 | 1.06 | -14 |
| 57 | San Antonio, TX | 0.79 | 0.82 | -4 | 0.97 | -18 |
| 58 | Houston-Baytown-Sugar Land, TX | 0.82 | 0.83 | -1 | 1.01 | -19 |
| 59 | Dallas-Plano-Irving, TX (MSAD) | 0.70 | 0.80 | -13 | 0.97 | -27 |

Source: HSBC, Assumes seven year holding period

HSBC

# 6. Charting the valuations

- We look at PI, PR, HOC-I, HOC-R and FHOC-R in chart form…
- …for 18 states and 36 cities
- *Home*Pulse users can look at over 200 areas and aggregates

## A picture is worth a thousand words

The tables we have provided through the course of this report using deviations from long-run averages to gauge today's valuations are useful, but there's nothing like seeing it in chart form to assess the evolution of valuation ratios over time and how they compare with previous boom and bust periods. Charts show us the variation and persistence of that variation from the average that can occur through time.

In this section, therefore, we show five valuation ratios on two charts for each of our selection of states and cities. The left side charts show PI and PR ratios, while the right side charts show the more sophisticated homeowner costs to income, homeowner costs to rent, and expected future homeowner costs to rent for the next seven years.

The grey shaded periods in the charts denote periods of falling real house prices. These are useful for gauging where valuations reached in the past before home price bear markets occurred, and how they compare to today.

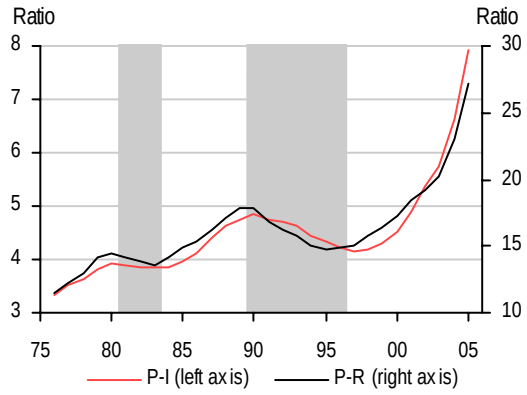
One can see that for many places, including California, Florida, Massachusetts, New Jersey, New York and Rhode Island, that the homeowner cost valuations are as extreme as they were during the previous cycle-tops in the late 1980s (early 1980s for Florida), just before bear markets began, suggesting a downturn may be imminent. The same argument applies to many cities, including Boston, Chicago, Honolulu, Los Angeles, Miami, New York City, San Diego, San Francisco, Seattle and Washington, DC. Las Vegas and Phoenix look extremely high compared to the past 20 years, but not from the perspective of the early 1980s (but it still looks uncomfortably high today to us).

Connecticut appears to be going against the grain. Although its PI and PR ratios have skyrocketed to above those seen in the late 1980s, the homeowner cost ratios have not reached the highs of the late 1980s, suggesting valuations may not be so bubbly there. Meanwhile, valuations in Atlanta, Charlotte and Dallas look attractive.

For the 'bubbly' areas, one would have to make a case on why such homeowner cost valuations should be higher today compared to the past, because although low real rates justify higher price-rent ratios, they don't justify higher homeowner-cost-to-rent ratios. For that, one needs to argue that risk premiums have permanently declined and/or expected capital gains have risen relative to the past. These are issues that we will tackle in sections 7 and 8.

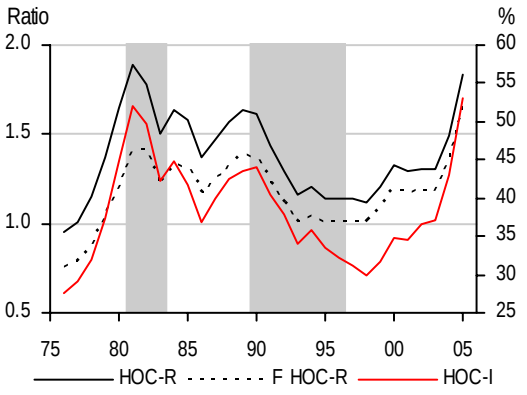
# Bubble zone valuations

**Total bubble zone house price valuations**



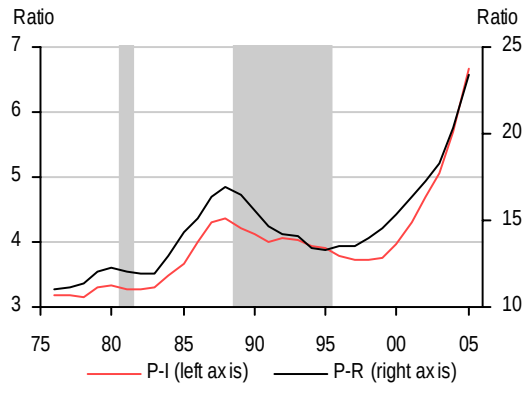

Source: HSBC

**Total bubble zone homeowner cost valuations**



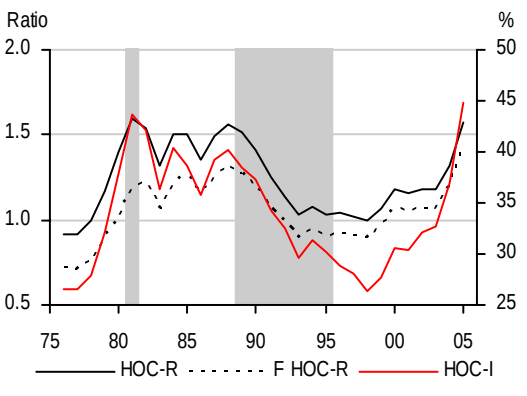

Source: HSBC

**Eastern bubble zone house price valuations**



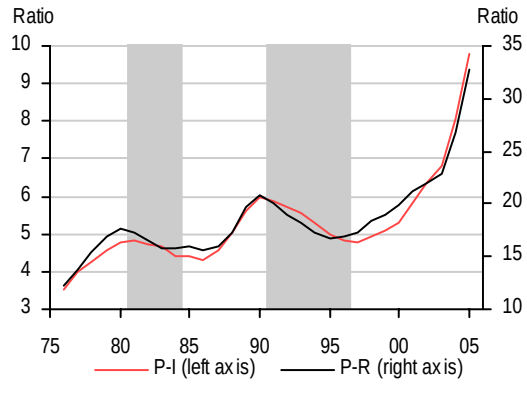

Source: HSBC

**Eastern bubble zone homeowner cost valuations**



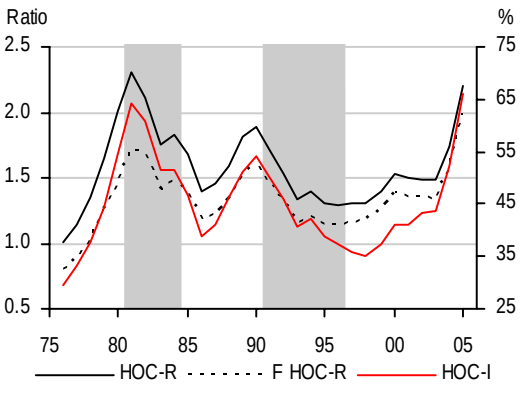

Source: HSBC

**Western bubble zone house price valuations**




Source: HSBC

**Western bubble zone homeowner cost valuations**




Source: HSBC

P-I = Price-to-income ratio
P-R = Price-to-rent ratio

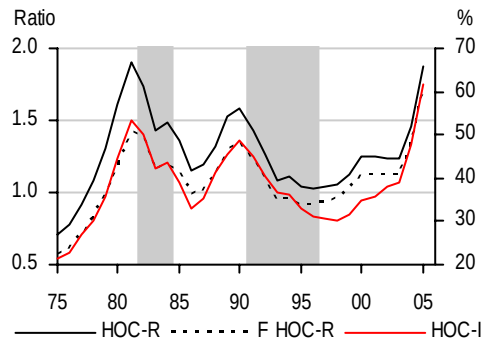
HOC-R = Homeowner cost compared to renting (left axis)
FHOC-R = Homeowner cost versus expected rents over seven years (left axis)
HOC-I = Homeowner cost as a proportion of income (right axis)

# State valuations

**California house price valuations**

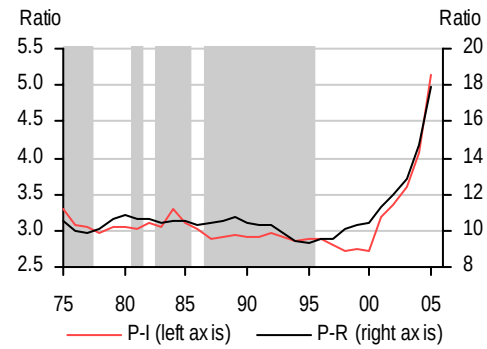

Source: HSBC

**California homeowner cost valuations**



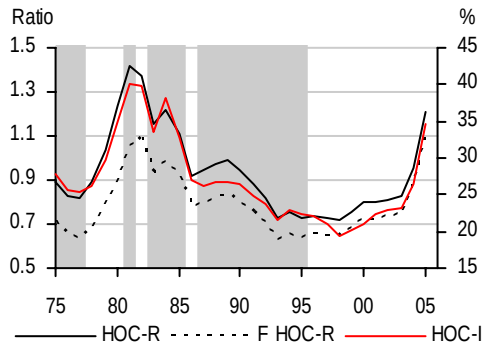

Source: HSBC

**Florida house price valuations**



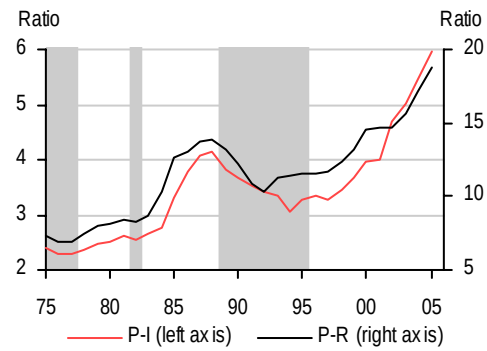

Source: HSBC

**Florida homeowner cost valuations**



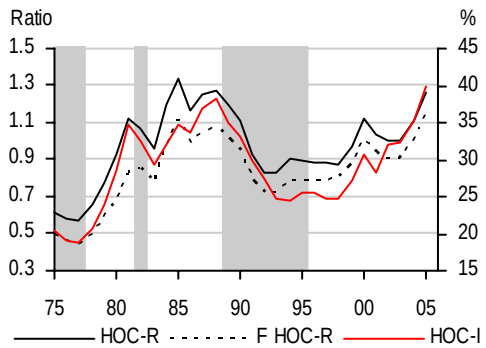

Source: HSBC

**Massachusetts house price valuations**




Source: HSBC

**Massachusetts homeowner cost valuations**



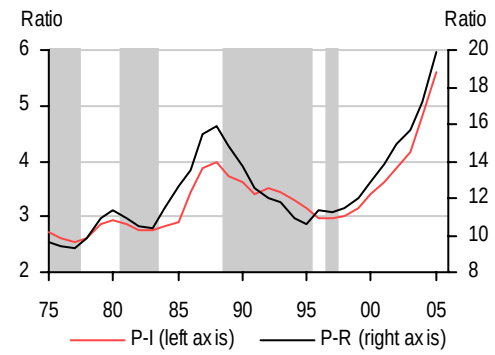

Source: HSBC

P-I = Price-to-income ratio
P-R = Price-to-rent ratio

HOC-R = Homeowner cost compared to renting (left axis)
FHOC-R = Homeowner cost versus expected rents over seven years (left axis)
HOC-I = Homeowner cost as a proportion of income (right axis)

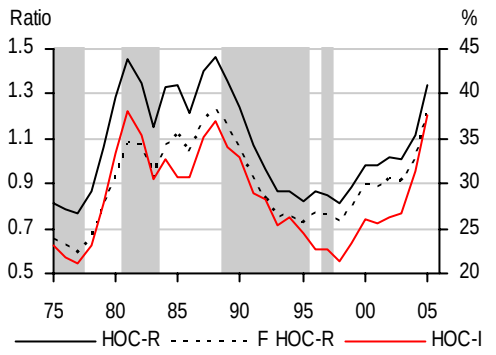
# State valuations

**New Jersey house price valuations**



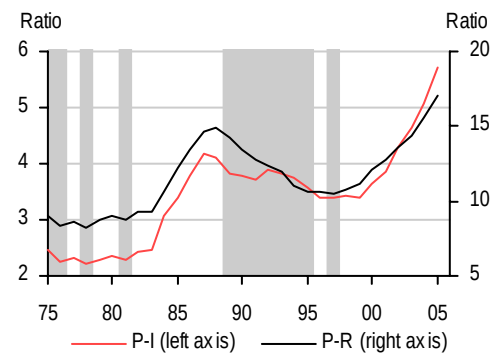

Source: HSBC

**New Jersey homeowner cost valuations**



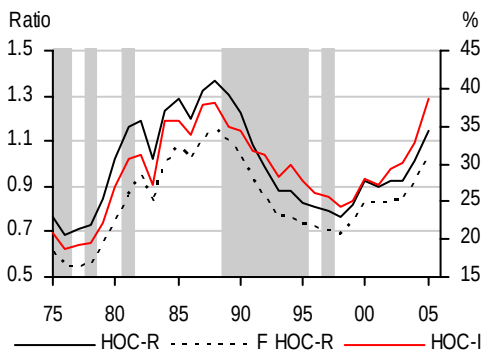

Source: HSBC

**New York state house price valuations**



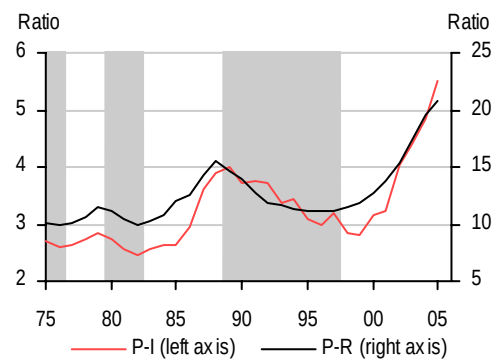

Source: HSBC

**New York state homeowner cost valuations**



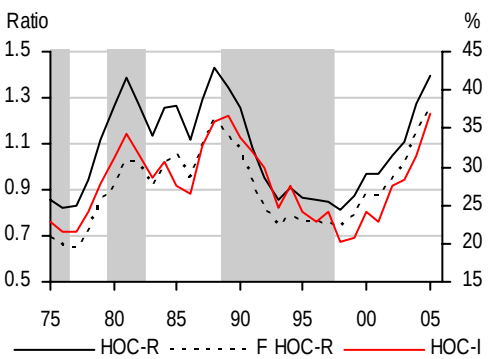

Source: HSBC

**Rhode Island house price valuations**




Source: HSBC

**Rhode Island homeowner cost valuations**



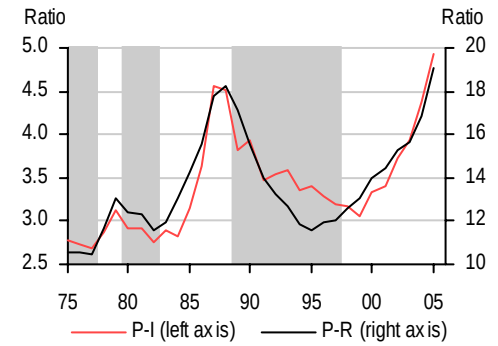

Source: HSBC

P-I = Price-to-income ratio
P-R = Price-to-rent ratio

HOC-R = Homeowner cost compared to renting (left axis)
FHOC-R = Homeowner cost versus expected rents over seven years (left axis)
HOC-I = Homeowner cost as a proportion of income (right axis)

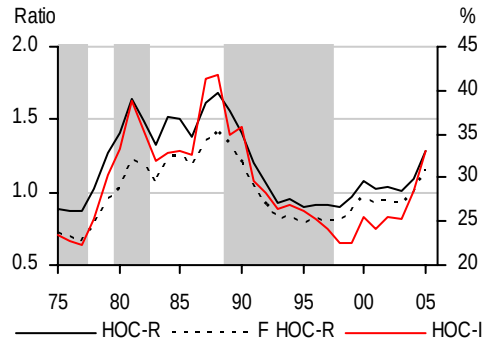
# State valuations

**Connecticut house price valuations**



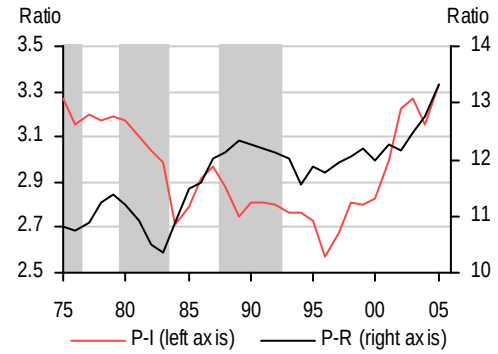

Source: HSBC

**Connecticut homeowner cost valuations**



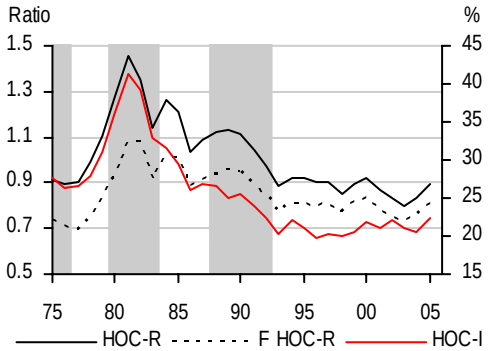

Source: HSBC

**North Carolina house price valuations**



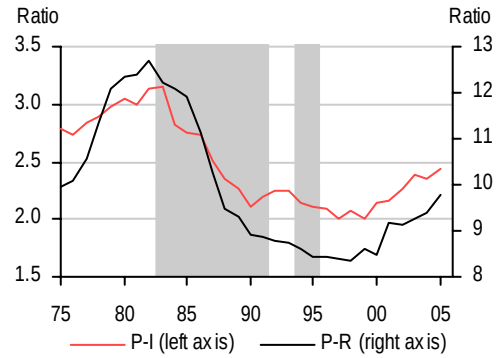

Source: HSBC

**North Carolina homeowner cost valuations**



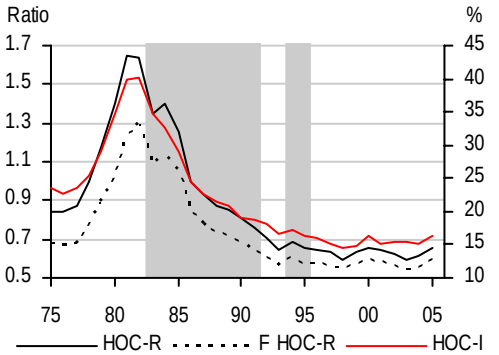

Source: HSBC

**Texas house price valuations**




Source: HSBC

**Texas homeowner cost valuations**



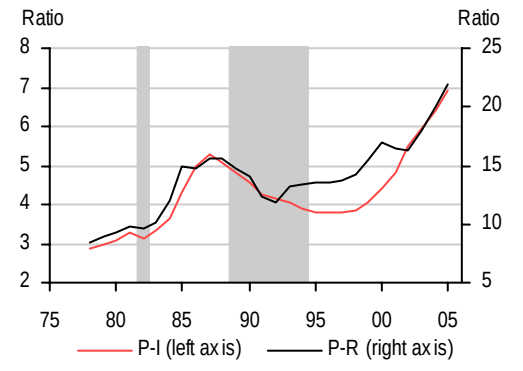

Source: HSBC

P-I = Price-to-income ratio
P-R = Price-to-rent ratio

HOC-R = Homeowner cost compared to renting (left axis)
FHOC-R = Homeowner cost versus expected rents over seven years (left axis)
HOC-I = Homeowner cost as a proportion of income (right axis)

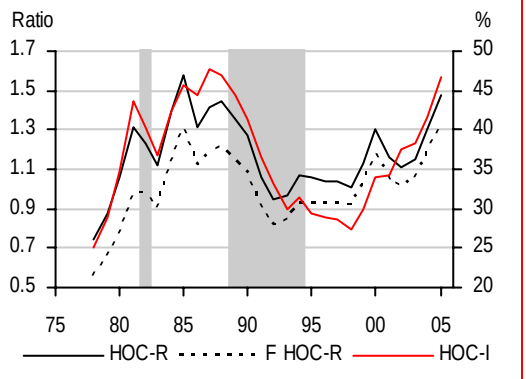
# Metropolitan area valuations

**Boston house price valuations**



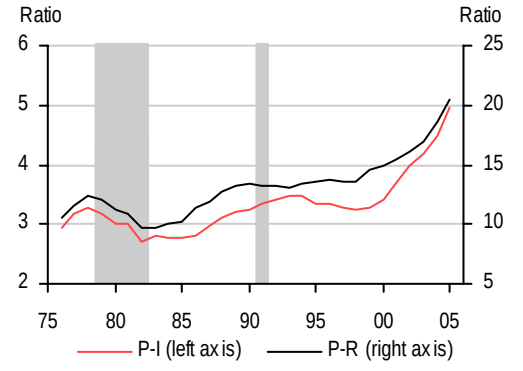

Source: HSBC

**Boston homeowner cost valuations**



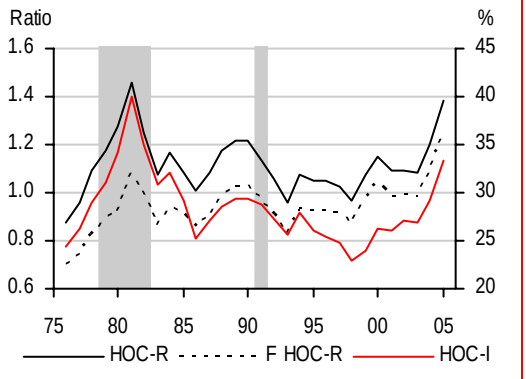

Source: HSBC

**Chicago house price valuations**



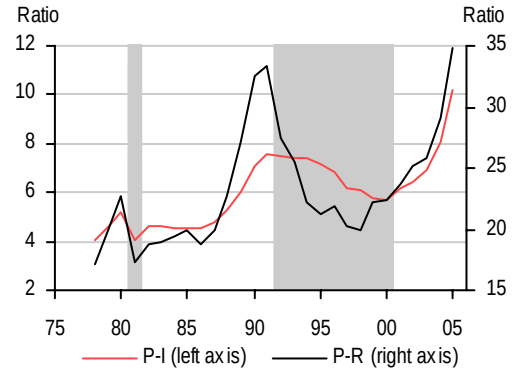

Source: HSBC

**Chicago homeowner cost valuations**



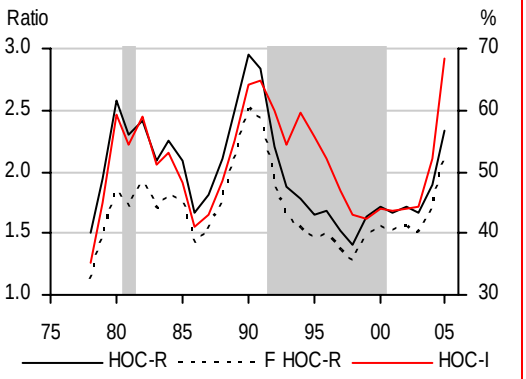

Source: HSBC

**Honolulu house price valuations**




Source: HSBC

**Honolulu homeowner cost valuations**




Source: HSBC

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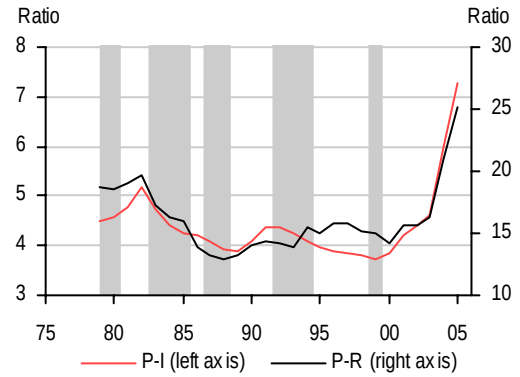
HOC-R = Homeowner cost compared to renting (left axis)
FHOC-R = Homeowner cost versus expected rents over seven years (left axis)
HOC-I = Homeowner cost as a proportion of income (right axis)

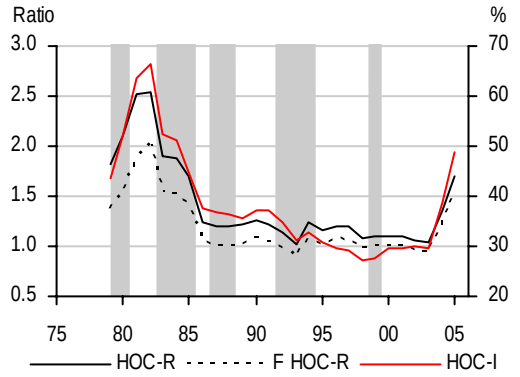
# Metropolitan area valuations

**Las Vegas house price valuations**



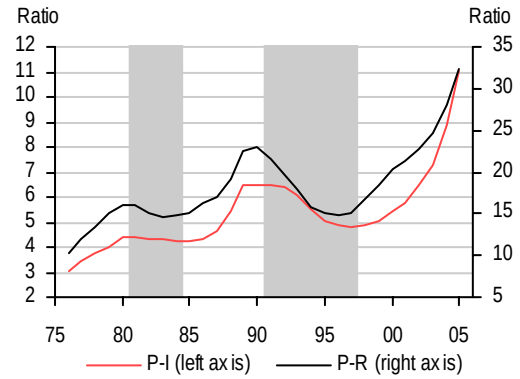

Source: HSBC

**Las Vegas homeowner cost valuations**



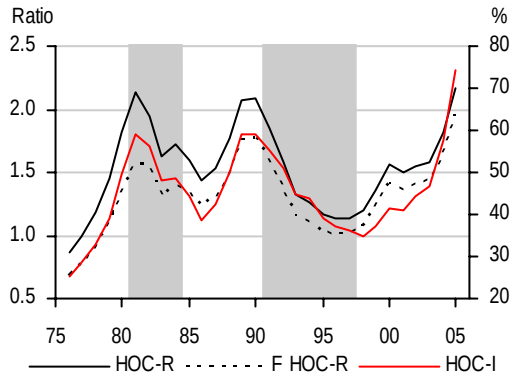

Source: HSBC

**Los Angeles house price valuations**



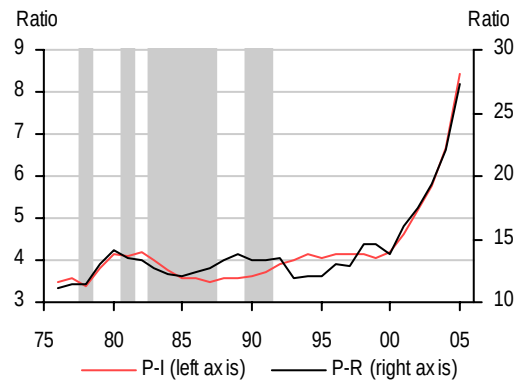

Source: HSBC

**Los Angeles homeowner cost valuations**



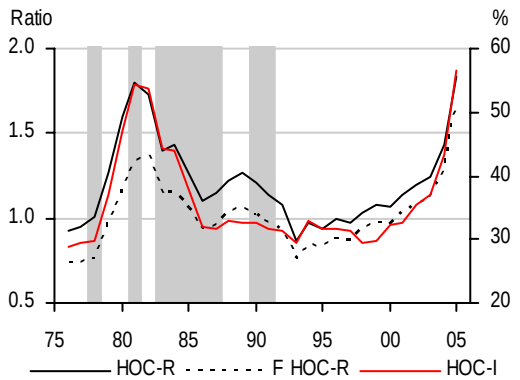

Source: HSBC

**Miami house price valuations**




Source: HSBC

**Miami homeowner cost valuations**




Source: HSBC

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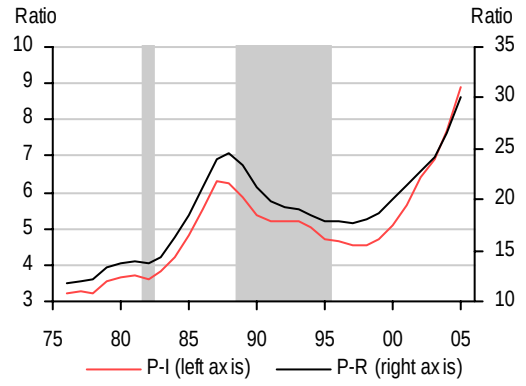
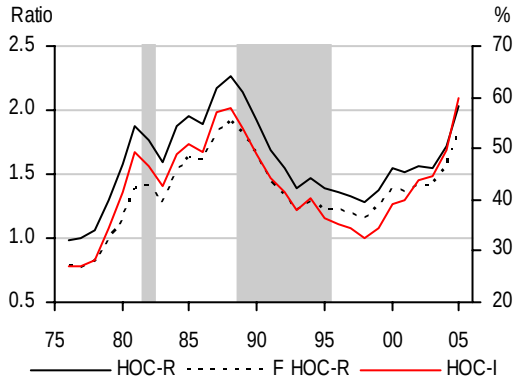
# Metropolitan area valuations

**New York City house price valuations**



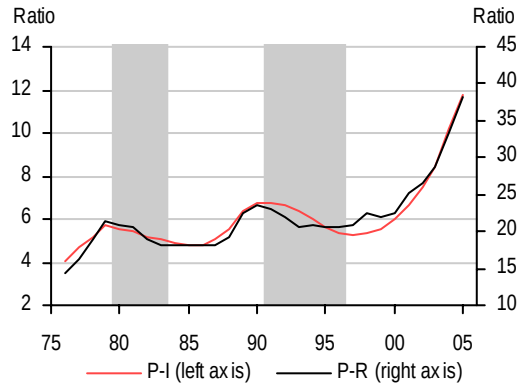

Source: HSBC

**New York City homeowner cost valuations**



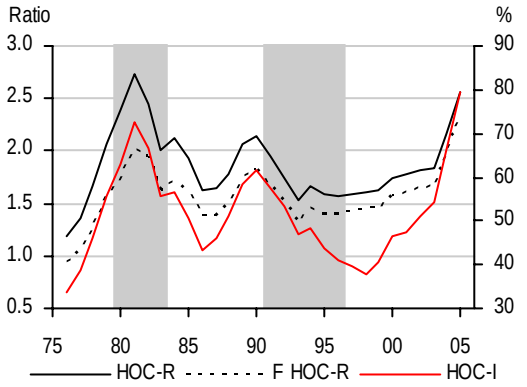

Source: HSBC

**San Diego house price valuations**



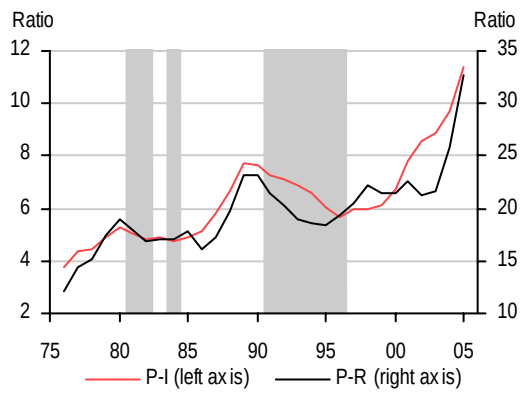

Source: HSBC

**San Diego homeowner cost valuations**



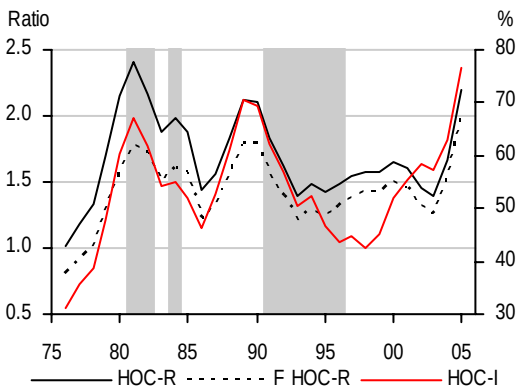

Source: HSBC

**San Francisco house price valuations**




Source: HSBC

**San Francisco homeowner cost valuations**




Source: HSBC

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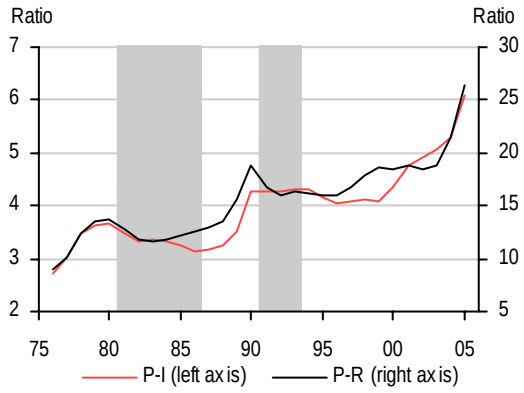
HOC-R = Homeowner cost compared to renting (left axis)
FHOC-R = Homeowner cost versus expected rents over seven years (left axis)
HOC-I = Homeowner cost as a proportion of income (right axis)

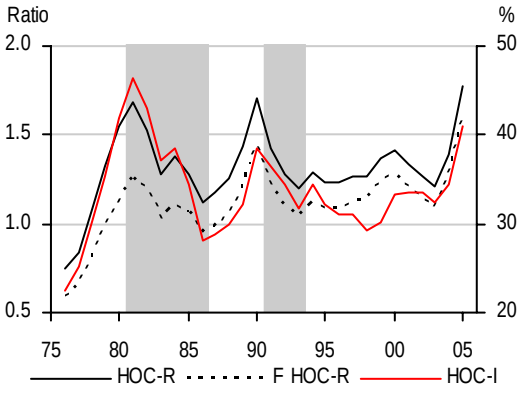
# Metropolitan area valuations

**Seattle house price valuations**



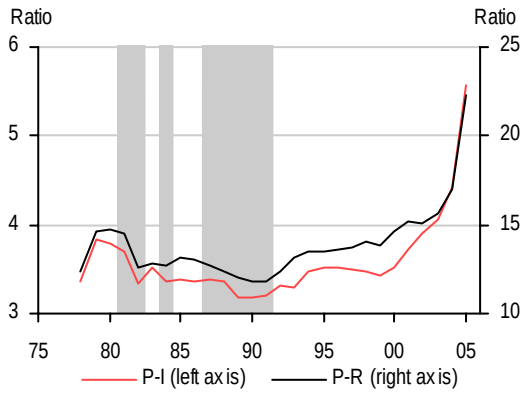

Source: HSBC

**Seattle homeowner cost valuations**



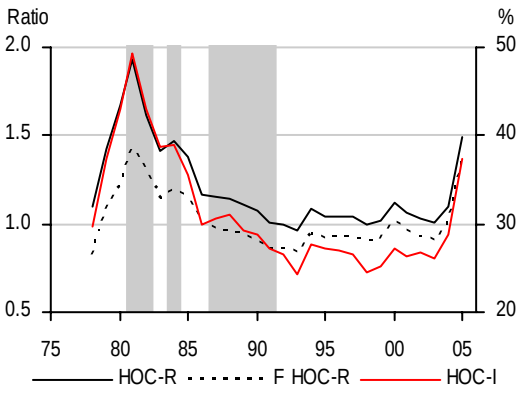

Source: HSBC

**Tuscon house price valuations**



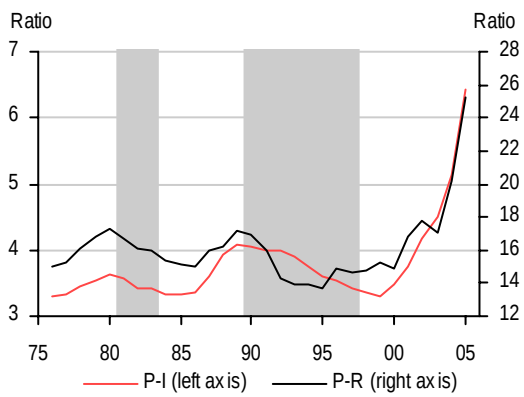

Source: HSBC

**Tuscon homeowner cost valuations**



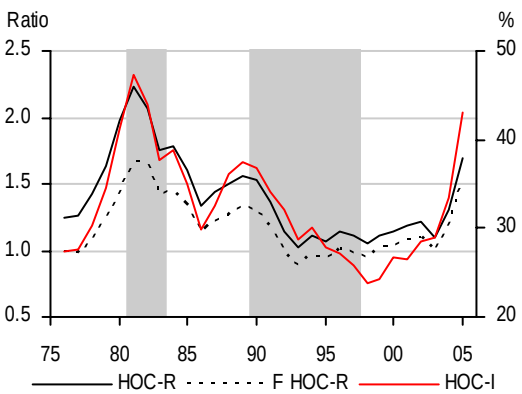

Source: HSBC

**Washington, DC house price valuations**




Source: HSBC

**Washington, DC homeowner cost valuations**




Source: HSBC

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HOC-R = Homeowner cost compared to renting (left axis)
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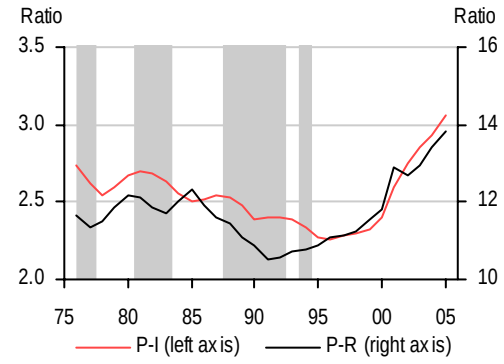
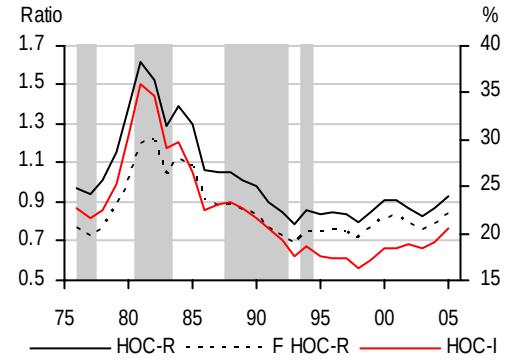
# Metropolitan area valuations

**Atlanta house price valuations**



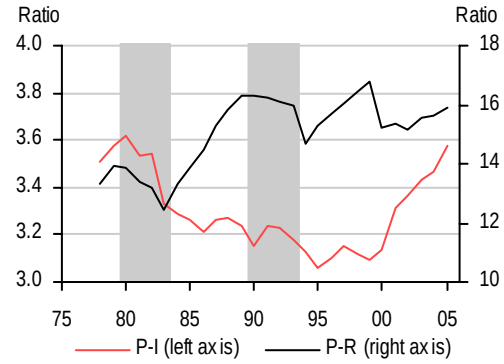

Source: HSBC

**Atlanta homeowner cost valuations**



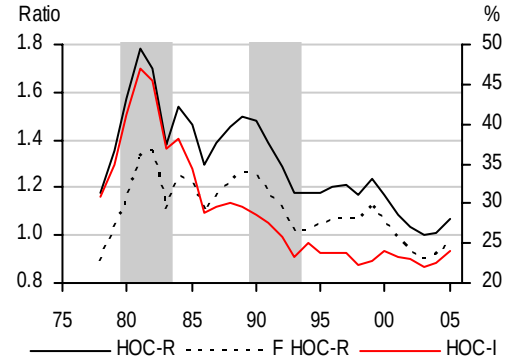

Source: HSBC

**Charlotte house price valuations**



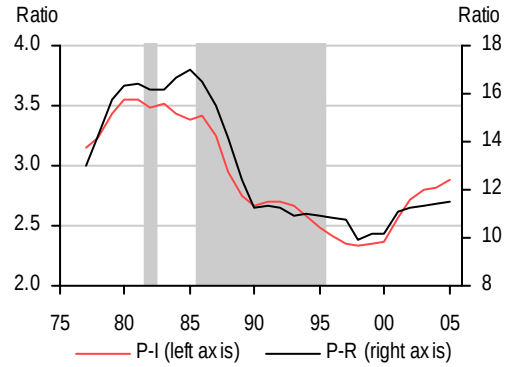

Source: HSBC

**Charlotte homeowner cost valuations**



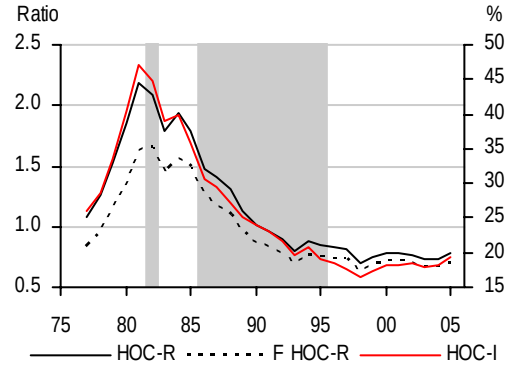

Source: HSBC

**Dallas house price valuations**




Source: HSBC

**Dallas homeowner cost valuations**




Source: HSBC

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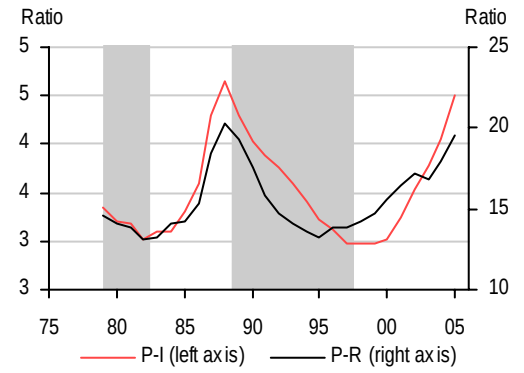
HOC-R = Homeowner cost compared to renting (left axis)
FHOC-R = Homeowner cost versus expected rents over seven years (left axis)
HOC-I = Homeowner cost as a proportion of income (right axis)

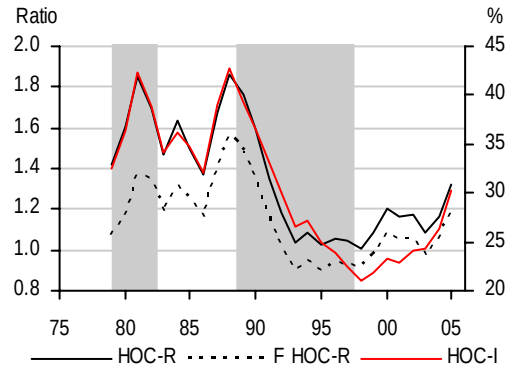
# Metropolitan area valuations

**Hartford house price valuations**



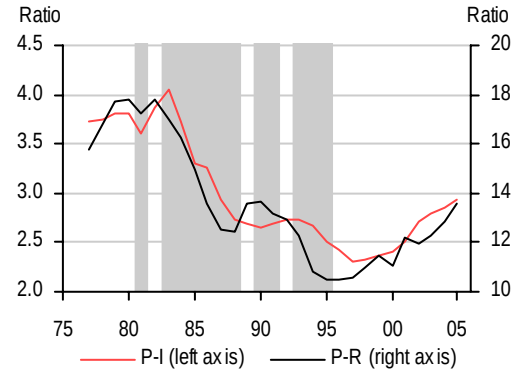

Source: HSBC

**Hartford homeowner cost valuations**



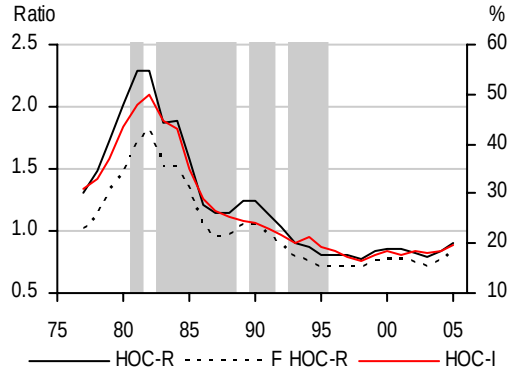

Source: HSBC

**Houston house price valuations**



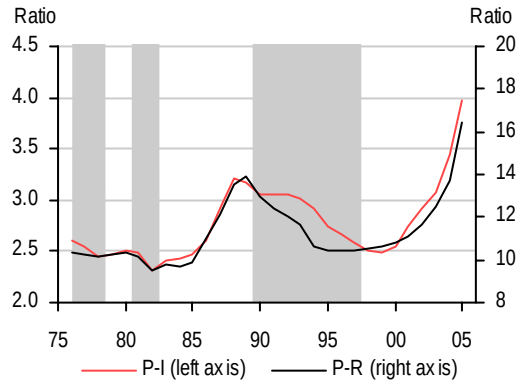

Source: HSBC

**Houston homeowner cost valuations**



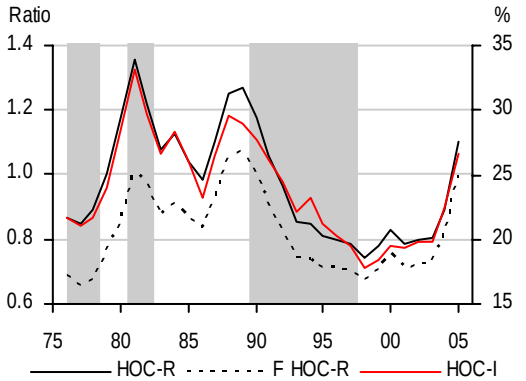

Source: HSBC

**Philadelphia house price valuations**




Source: HSBC

**Philadelphia homeowner cost valuations**




Source: HSBC

P-I = Price-to-income ratio
P-R = Price-to-rent ratio

HOC-R = Homeowner cost compared to renting (left axis)
FHOC-R = Homeowner cost versus expected rents over seven years (left axis)
HOC-I = Homeowner cost as a proportion of income (right axis)

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# 7. Housing risk premiums

- We use three approaches to estimate risk premiums
- A 'backward looking', a 'forward looking' and…
- …a price volatility-based set of risk premiums
- Comparing housing and equity risk premiums

## "History has not dealt kindly…"

"*… this vast increase in the market value of asset claims is in part the indirect result of investors accepting lower compensation for risk. Such an increase in market value is too often viewed by market participants as structural and permanent.*

*"To some extent, those higher values may be reflecting the increased flexibility and resilience of our economy. But what they perceive as newly abundant liquidity can readily disappear. Any onset of increased investor caution elevates risk premiums and, as a consequence, lowers asset values and promotes the liquidation of the debt that supported higher asset prices.*

*This is the reason that history has not dealt kindly with the aftermath of protracted periods of low risk premiums.*"

Alan Greenspan, 2005

## Risky measures

Greenspan's above comments acknowledges that risk premiums on assets generally may have structurally fallen for good fundamental reasons, thereby supporting higher prices, but that some portion of the decline in risk premiums may nevertheless be unjustified, thereby putting high prices at risk of an eventual decline. Does this idea apply to the housing market?

First, should there be a housing risk premium at all? Historically there has been (as we will show) and reasons for it include:

- Typically, a house is a highly leveraged investment.
- There's the possibility of delinquency and default due to unemployment risk.
- If that happens, you risk losing your home.
- If you default, your credit score gets hammered, severely restricting access to future borrowing.
- There's the risk of falling house prices, which could restrict your ability to move if your outstanding mortgage becomes larger than the value of your home (think Japan, UK and Scandinavia in the early 1990s).
- For adjustable rate mortgages, there's the risk of an uncertain rise in interest rates.
- There is a risk that government deficits will mean a tax rise at some future point, thereby reducing future disposable income and debt-servicing ability.

- Earthquakes, hurricanes and floods are among the natural disaster risks, not to mention a terrorist risk involving biological or chemical weapons that could require city-wide evacuation for an extended time.

Has the housing risk premium fallen permanently or is it under some risk of (at least partially) rising again?

To help answer this, we use the Gordon growth model and its rearrangements as a useful starting point, where financial theory states that the risk free rate (RFR) plus the housing risk premium (HRP) is equal to the net rental yield (NRY) plus the expected growth rate in rental income (G),

*RFR + HRP = NRY + G*

RFR + HRP is the cost of capital (COC) while RY + G is the return on capital (ROC). Financial theory states that COC = ROC for the marginal homebuyer assuming a competitive housing market.

*COC = ROC*

Note that the HRP component of the COC incorporates not just the excess return the homeowner requires, or the owner risk premium (O-RP), but also the excess return the lending institution requires, or the lenders' risk premium (L-RP) that is expressed in the form of the excess of the mortgage rate over the risk free rate. This way, an adjusted Gordon growth model for housing would read:

*RFR + L-RP + O-RP = NRY + G*

(where *RFR + L-RP* is equal to the after-tax mortgage rate). This is one reason why our calculations of housing risk premiums that we are about to present tend to be high relative to the equity risk premium (which we'll get to later).

Assuming a reasonably efficient housing market, homeowner costs and renting should be roughly the same for a similar quality house. This way, a decline in real interest rates, by pushing down homeowner costs below that of rent, makes homeownership more attractive. This pushes house prices up (if rents don't change) so that homeownership costs can rise to equalize with rents.

This justifies a higher price-rent ratio, but not a higher homeowner cost to rent ratio. So if real rates cannot explain why homeowner costs should deviate from rents, what can? At the end of the day, it's changes in two things: the risk premium (HRP) or expected housing returns (G).

- The risk premium acts to push homeowner costs down to below that of rents, to reflect the riskiness of owning versus renting. (This is the focus of this chapter.)
- Expected future housing returns, a function of expected future rental growth or expected future rent saved in the case of an owner-occupied home, acts to raise homeowner costs to above that of rent. Buying a house on a fixed mortgage rate can be a good hedge against unexpected increases in future rents, and it can make sense to pay a premium for that protection. Changes in capital gains tax rates can change the expected after-tax return on housing too. (Required capital gains are the subject of the next chapter.)

How these two factors balance out determines whether homeowner costs are higher or lower than rents (whether the ratio is higher or lower than 1.0).

In California, homeowner costs are higher than rents, meaning that expected housing returns more than offset the risk premium. In Texas, homeowner costs are lower than rent, suggesting the risk premium is higher than the expected housing returns.

As an example, let's take California, where homeowner costs to rent is 1.87 in 2005Q3, a ratio that is 48% above the 20-year average. The marginal homebuyer is apparently happy to pay, say, USD3740 per month versus USD2000 in rent, or put another way, happy to use 60% of income to be able to own rather than spend 33% on rent.

This higher "ownership" premium relative to the past must either be because the risk premium has declined or expected future housing returns have risen.

(Remember, it cannot be because of the decline in real rates, because that should only raise house prices by enough to equalize the long-run own-to-rent ratio, not push it up even higher.)

But beware that it is not observable which of these factors is changing. It could be one of them, it could be both, or the change in one variable (say the risk premium) may be more than offsetting a change in the opposite direction of the other variable (say the expected capital gain).

If we make an assumption about expected housing returns, we can observe what the risk premium is doing, and vice-versa, but we can't do both. With this in mind, we now focus on the risk premium (assuming expected rental income grows in line with expected future inflation) before moving on to required capital gains in the next chapter (given various assumptions for risk premiums).

## Changes in the risk premium

We use three approaches to estimate housing risk premiums so we can assess whether they might be too low.

- A forward looking (i.e. ex-ante) housing risk premium for any state or city can be backed out from a reconfigured version of the Gordon growth model. Only a small rearrangement is needed for the risk premium equation. We think this is a sensible approach.

  $RFR + RP = NRY + G$

  $RP = NRY + G - RFR$

- A second approach is to simply see what the excess return on housing has averaged in the past (house price growth plus net rental yield less 10-year Treasury yield). This backward looking or 'ex-post' risk premium could be a guide to where it might average in future. This probably gives too high an historical risk premium for the hot housing markets than is justified to use in the future, as past gains and hence excess returns have probably exceeded most people's expectations, and would not rationally expect such returns for the future.

- A third approach is to apply a reasonable estimate of the housing risk premium for the US average (based on the ex-ante method, say), and then calculate risk premiums for cities and states based on historical price volatility relative to the US average. This approach seems rational too, although for some markets, they spit out premiums that seem unreasonably high.

## The forward looking approach

Our first approach finds that the current implied ex-ante risk premium for the US average is 3.7%. This is 42% lower than the 30-year average of 6.4%, suggesting a nation-wide problem may be at hand. Even if some decline in the risk premium is justified, it could be too low as it is the lowest reading in our 30-year history. This is especially the case for the 'bubble zone', where the risk premium is 2.6%, 53% below its 30-year average of 5.6%.

California, Hawaii, DC, Oregon and Maryland top the list of bubbly markets here. California and Hawaii in particular stand out, as their risk

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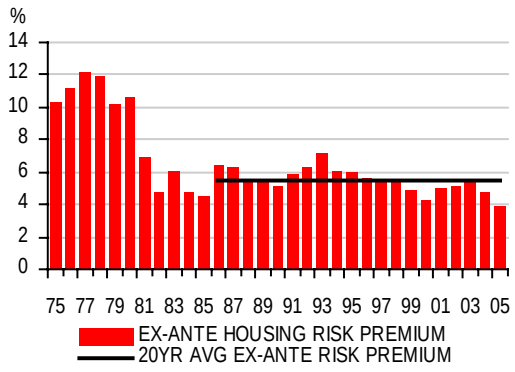
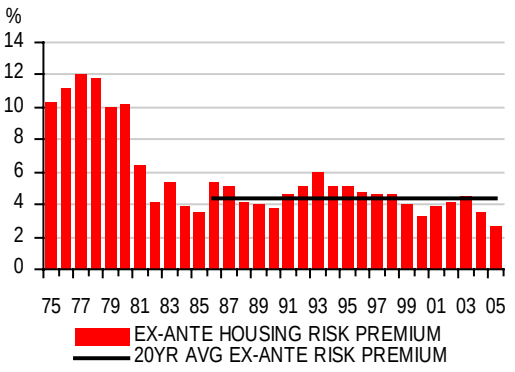
7A. Ex-ante US housing risk premium




Source: HSBC

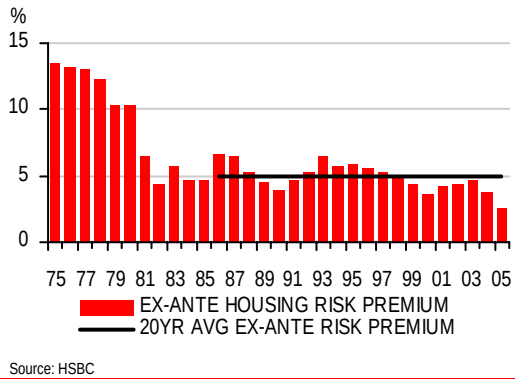
7B. Ex-ante 'bubble zone' housing risk premium




Source: HSBC

premiums are just 2.5% and 2.0%, respectively, whereas although low compared to history, all other states are higher than 3%.

7C. California 'forward looking' risk premium




Source: HSBC

There are a handful of cities that have risk premiums of less than 2%, including Santa Ana, CA, Oakland, San Diego, Honolulu and Bridgeport-Stamford CT. Those in the 2-2¾% range include New York City, Newark, Sacramento, San Francisco, Los Angeles, Riverside-San Bernardino, CA, Miami and Seattle.

The three cities that have the largest risk premiums (relative to their own historical averages) are all in Texas – Dallas, San Antonio and Houston – while Austin is also way up there in terms of a high risk premium.

For the US as a whole and for the bubble zone specifically, the risk premiums have come down a long way. There are a number of reasons the housing risk premium may have structurally and permanently declined, which acts to justify a higher homeowner costs to rent ratio (and a higher price-rent ratio than what can be justified by a lower real interest rate alone):

- The risk premium may be positively correlated with the decline in the risk-free real interest rate. Lower real interest rates reflect lower inflation expectations and lower expected inflation volatility (thanks to central bank credibility), thereby reducing uncertainty and therefore reducing the risk premium.
- Lower inflation expectations and lower inflation volatility allows a better deployment of the economy's resources, reducing the chances of potential imbalances and mistakes building, thereby reducing overall GDP volatility (and labour market volatility), and therefore reducing the risk premium.
- Increasing competition and innovation in the mortgage and housing markets has expanded credit supply and lowered the cost of capital (COC) by producing lower real mortgage rates relative to the risk-free rate, as mortgage

fees and points have been reduced, non-traditional mortgagees introduced, and computers more effectively used for assessing borrowers, all acting to reduce the excess required by lenders over the risk free rate (i.e. a lower L-RP).

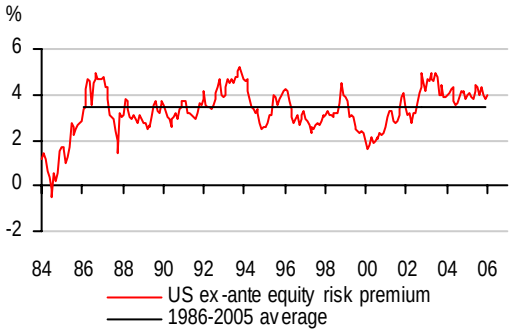
- Mortgage finance innovation allows homeowners greater access to the home equity that has been built up in the home, through cash-outs or home equity loans, thereby allowing homeowners access to liquidity should unforeseen circumstances emerge, thereby promoting macroeconomic stability.
- The improved functioning and liquidity of real estate brokers and mortgage markets makes it less of a hassle, and therefore less of a risk to buy or sell houses when required.
- Mortgage insurance lessens risks (but if anything, many borrowers have avoided having to pay mortgage insurance, which is required if the downpayment is low, by taking out second-lien loans).

## Comparing housing and equity ex-ante risk premiums

One of the weaknesses of the above arguments is that the lower risk premium argument was used for stocks in the late 1990s, only to end in tears when the bubble burst. It would be more convincing if the stock market also had a lower risk premium priced in today. This is not the case.

As chart 7D shows, the ex-ante equity risk premium has been at the high end of its 20-year range for the past few years. If the risk premium has declined for housing, why not for equities? One reason is that fashions do change. The bursting of the equity bubble led to a re-rating of housing values thanks to asset allocation shifts due to changing preferences.

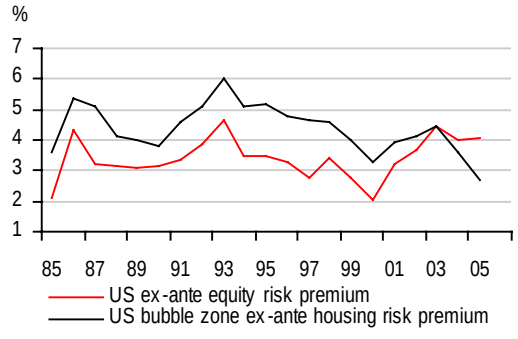
**7D. Ex-ante equity risk premium**




Source: HSBC Strategy

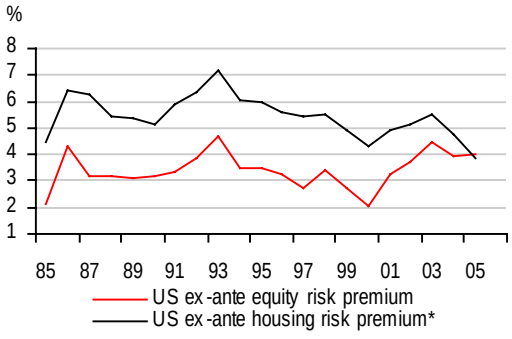
Chart 7E and 7F support this contention. For the first time in the past 20 years, the bubble zone housing market ex-ante risk premium is lower in 2005 than the equity risk premium. The gap between the US average HRP and ERP has

**7E. Comparison with bubble zone housing risk premium**




Source: HSBC

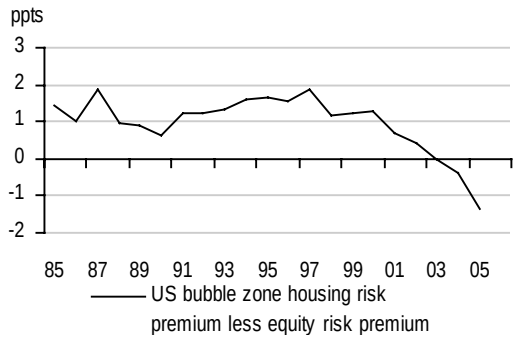
**7F. Comparison with US housing risk premium**




Source: HSBC

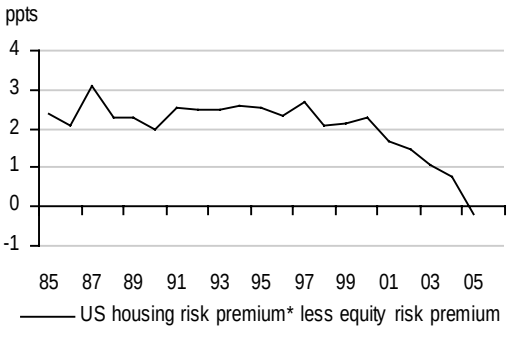
* Weighted average of 151 metropolitan median house prices

**7G. Bubble zone housing risk premium less equity risk premium**




Source: HSBC

**7H. US housing risk premium less equity risk premium**




Source: HSBC

* Weighted average of 151 metropolitan median house prices

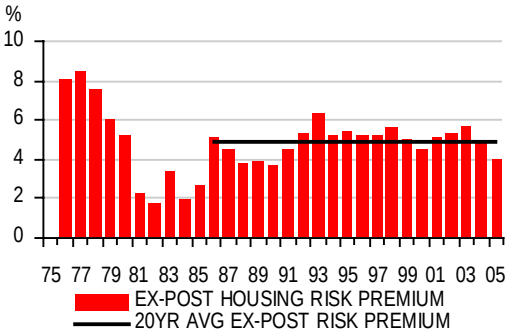
closed, again for the first time in the past twenty years. Charts 7G and 7H illustrate how those gaps have closed. This suggests a frothy housing market (and undemanding valuations for the stock market, according to HSBC strategists).

Presumably if people find equities more attractive, one risk is that housing risk premiums rise in response. Whatever the cause, there are cyclical shifts in housing risk premiums too, and the given the big move down in the bubble zone in the past few years, the key risk is that the next major move will be up, as there is simply little room left to fall.

## The backward looking approach

The 'ex-post' measure of risk premiums for states and cities are shown in tables 7.3 and 7.4. The average US housing risk premium is currently 3.9%, 20% lower than the 30-year average of 4.8%. For the bubble-zone, it is 3.9%, 24% below the 30-year average of 5.2%, while for the non-bubble zone, the risk premium is 4%, virtually right on its 30-year average.

**Ex-post housing risk premium**




Source: HSBC

On the basis of its deviation from its 30-year average, Miami, Palm Bay, Phoenix, Baltimore, Chicago and Tuscon make it into the top 10 'bubbliest' markets. By state, the usual suspects like DC, Florida and Arizona are among the highest, but so is Wyoming, while California and New York are somewhere further down the list.

## The price-volatility based approach

We assumed that a correct and reasonable estimate of the average US risk premium should be 3½% (close to the 3.7% ex-ante and 3.9% ex-post estimates).

Based on relative price volatility, tables 7.5 and 7.6 lists the risk premiums for the individual states and cities, ranked from highest to lowest. On this

basis, the 'bubble zone' should have a risk premium of about 5% (but the ex-ante is only pricing in 2.6%, suggesting an overheated market) while the 'non-bubble zone' should be half that at 2½% (but the ex-ante is pricing in twice that at 5.2%, suggesting a cheap market).

It is striking that those with the lowest risk premiums on an ex-ante basis such as Honolulu, Riverside, Los Angeles, Santa Ana, San Diego and Bridgeport-Stamford also have the highest historical price volatility, suggesting things could get particularly nasty in these areas if a general downswing emerges.

Meanwhile, Buffalo, St Louis, Cleveland, Pittsburgh, Atlanta, Omaha, Columbus, Charlotte and Cedar Rapids have unusually high ex-ante risk premiums, but very low price volatility.

## Table guides

Tables 7.1 and 7.2 show the ex-ante, or forward looking, housing risk premiums as of 2005Q3 that are being implicitly priced in by housing markets, and utilizes the rearranged Gordon growth model to solve for these risk premiums.

We also show the 20- and 30-year average risk premiums and how 2005Q3 deviates from those long-run averages. We rank the states and cities by how the 2005Q3 risk premiums are deviating from their 30-year average.

Tables 7.3 and 7.4 show the ex-post, or backward looking, housing risk premiums, derived from the excess returns on housing, calculated as house price growth plus net rental yield less 10-year Treasury yield. Again, the 20- and 30 year averages and deviations are shown.

Tables 7.5 and 7.6 show the volatility based housing risk premiums. We assume a 3.5% risk premium for the US. We rank the states and cities from highest to lowest based on this version of the risk premium. For ease of comparison, we once again show the ex-ante and ex-post risk premiums on these tables.

Some may wonder whether we should just throw out the whole concept of housing risk premiums, based on the assumption that owner-occupiers view housing as a place to live as opposed to an investment, and behave as if buying a house is risk-free, despite it being typically a highly leveraged investment. This section has shown that history does not support this notion.

HSBC

# 7.1 Ex-ante housing risk premium: states

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| | United States (median) | 4.9 | 6.7 | -27 | 7.6 | -36 |
| | United States (average)* | 3.7 | 5.5 | -32 | 6.4 | -42 |
| | | | | | | |
| | Total Bubble Zone | 2.6 | 4.4 | -41 | 5.6 | -53 |
| | Eastern Bubble Zone | 3.2 | 5.0 | -36 | 6.3 | -49 |
| | Western Bubble Zone | 2.0 | 3.8 | -47 | 4.8 | -59 |
| | Non-Bubble Zone | 5.2 | 6.4 | -18 | 7.1 | -26 |
| | | | | | | |
| **1** | California | 2.5 | 4.9 | -49 | 6.1 | **-59** |
| **2** | Hawaii | 2.0 | 3.2 | -39 | 4.3 | **-54** |
| **3** | District of Columbia | 3.8 | 7.4 | -48 | 8.1 | **-53** |
| **4** | Oregon | 3.5 | 6.0 | -43 | 6.9 | **-50** |
| **5** | Maryland | 3.4 | 5.6 | -39 | 6.8 | **-50** |
| **6** | Rhode Island | 3.7 | 6.1 | -39 | 7.4 | **-49** |
| **7** | Massachusetts | 4.3 | 6.3 | -32 | 8.3 | **-49** |
| **8** | Nevada | 3.5 | 6.4 | -45 | 6.8 | **-49** |
| **9** | Washington | 3.5 | 5.5 | -36 | 6.8 | **-49** |
| **10** | Florida | 4.5 | 7.9 | -43 | 8.6 | **-48** |
| **11** | Montana | 4.6 | 7.9 | -41 | 8.9 | **-47** |
| **12** | New Jersey | 3.9 | 6.1 | -36 | 7.4 | **-47** |
| **13** | Arizona | 4.2 | 7.1 | -41 | 7.8 | **-46** |
| **14** | Virginia | 3.7 | 5.6 | -33 | 6.9 | **-46** |
| **15** | Maine | 5.9 | 8.6 | -32 | 10.5 | **-44** |
| **16** | Delaware | 4.2 | 6.1 | -31 | 7.4 | **-43** |
| **17** | Vermont | 5.7 | 8.4 | -32 | 10.0 | **-43** |
| **18** | New York | 4.8 | 6.5 | -26 | 8.1 | **-41** |
| **19** | Wyoming | 5.3 | 8.7 | -39 | 8.9 | **-40** |
| **20** | Illinois | 5.5 | 7.7 | -28 | 9.0 | **-39** |
| **21** | New Hampshire | 5.4 | 7.4 | -28 | 8.7 | **-38** |
| **22** | Colorado | 4.5 | 6.3 | -28 | 7.3 | **-38** |
| **23** | Minnesota | 5.6 | 8.0 | -30 | 9.0 | **-37** |
| **24** | Connecticut | 4.2 | 5.6 | -25 | 6.6 | **-37** |
| **25** | Wisconsin | 5.3 | 7.3 | -27 | 8.2 | **-35** |
| **26** | Utah | 4.3 | 5.6 | -24 | 6.5 | **-35** |
| **27** | Michigan | 6.4 | 8.3 | -23 | 9.6 | **-33** |
| **28** | Pennsylvania | 6.3 | 8.2 | -22 | 9.3 | **-32** |
| **29** | Alaska | 5.3 | 6.9 | -23 | 7.7 | **-31** |
| **30** | Kentucky | 6.5 | 8.2 | -20 | 9.2 | **-29** |
| **31** | North Dakota | 6.9 | 9.5 | -27 | 9.7 | **-29** |
| **32** | Idaho | 5.2 | 6.7 | -23 | 7.3 | **-29** |
| **33** | South Dakota | 7.6 | 9.8 | -22 | 10.5 | **-28** |
| **34** | New Mexico | 5.5 | 7.0 | -22 | 7.4 | **-26** |
| **35** | West Virginia | 6.8 | 8.5 | -20 | 9.1 | **-25** |
| **36** | Iowa | 7.8 | 9.9 | -21 | 10.3 | **-24** |
| **37** | South Carolina | 6.3 | 7.4 | -16 | 8.2 | **-24** |
| **38** | Tennessee | 6.7 | 7.7 | -14 | 8.6 | **-23** |
| **39** | Georgia | 6.6 | 7.8 | -16 | 8.4 | **-22** |
| **40** | Missouri | 7.2 | 8.3 | -14 | 9.1 | **-21** |
| **41** | Kansas | 7.4 | 9.3 | -20 | 9.4 | **-21** |
| **42** | Alabama | 6.5 | 7.6 | -14 | 8.2 | **-21** |
| **43** | Ohio | 6.4 | 7.3 | -12 | 8.0 | **-20** |
| **44** | Oklahoma | 8.5 | 10.3 | -18 | 10.4 | **-19** |
| **45** | Louisiana | 7.0 | 8.6 | -18 | 8.6 | **-18** |
| **46** | Nebraska | 7.8 | 9.0 | -14 | 9.5 | **-18** |
| **47** | Arkansas | 7.6 | 9.0 | -15 | 9.2 | **-17** |
| **48** | North Carolina | 6.4 | 6.8 | -6 | 7.7 | **-17** |
| **49** | Indiana | 7.5 | 8.2 | -9 | 8.8 | **-15** |
| **50** | Mississippi | 9.1 | 10.0 | -8 | 10.5 | **-13** |
| **51** | Texas | 9.1 | 9.6 | -5 | 9.4 | **-3** |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices.

HSBC

# 7.2 Ex-ante housing risk premium: cities

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| 1 | Riverside-San Bernardino-Ontario, CA | 2.0 | 4.5 | -56 | 5.5 | -64 |
| 2 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 1.4 | 3.0 | -53 | 3.8 | -63 |
| 3 | Oakland-Fremont-Hayward, CA (MSAD) | 1.3 | 2.6 | -50 | 3.6 | -63 |
| 4 | San Diego-Carlsbad-San Marcos, CA | 1.5 | 3.0 | -48 | 4.0 | -61 |
| 5 | Miami-Miami Beach-Kendall, FL (MSAD) | 2.6 | 5.6 | -54 | 6.6 | -61 |
| 6 | Nassau-Suffolk, NY (MSAD) | 2.8 | 5.3 | -46 | 7.1 | -60 |
| 7 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 2.0 | 3.8 | -46 | 5.0 | -60 |
| 8 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 2.0 | 3.4 | -41 | 4.5 | -56 |
| 9 | Seattle-Bellevue-Everett, WA (MSAD) | 2.7 | 4.5 | -40 | 6.0 | -55 |
| 10 | Sacramento-Arden-Arcade-Roseville, CA | 2.4 | 4.4 | -45 | 5.4 | -55 |
| 11 | New York-Wayne-White Plains, NY-NJ (MSAD) | 2.2 | 3.4 | -33 | 4.8 | -54 |
| 12 | Newark-Union, NJ-PA (MSAD) | 2.3 | 3.7 | -38 | 4.8 | -53 |
| 13 | Providence-New Bedford-Fall River, RI-MA | 3.0 | 4.9 | -39 | 6.2 | -51 |
| 14 | Honolulu, HI | 1.8 | 2.7 | -34 | 3.6 | -50 |
| 15 | Palm Bay-Melbourne-Titusville, FL | 3.8 | 7.5 | -49 | 7.5 | -49 |
| 16 | Portland-Vancouver-Beaverton, OR-WA | 3.3 | 5.5 | -41 | 6.5 | -49 |
| 17 | Bridgeport-Stamford-Norwalk, CT | 1.8 | 2.6 | -32 | 3.4 | -48 |
| 18 | Baltimore-Towson, MD | 3.8 | 6.1 | -38 | 7.2 | -48 |
| 19 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 2.9 | 4.9 | -41 | 5.5 | -48 |
| 20 | Tucson, AZ | 3.4 | 5.8 | -41 | 6.5 | -47 |
| 21 | Boston-Quincy, MA (MSAD) | 3.5 | 5.3 | -34 | 6.5 | -47 |
| 22 | Phoenix-Mesa-Scottdale, AZ | 4.0 | 6.9 | -43 | 7.4 | -47 |
| 23 | Chicago-Naperville-Joliet, IL (MSAD) | 3.8 | 5.7 | -33 | 7.0 | -46 |
| 24 | Edison, NJ (MSAD) | 3.7 | 5.6 | -34 | 6.7 | -45 |
| 25 | Las Vegas-Paradise, NV | 2.9 | 5.2 | -44 | 5.3 | -45 |
| 26 | Virginia Beach-Norfolk-Newport News, VA-NC | 4.4 | 6.7 | -34 | 7.6 | -42 |
| 27 | Tampa-St. Petersburg-Clearwater, FL | 4.7 | 7.5 | -37 | 8.1 | -42 |
| 28 | Charleston-North Charleston, SC | 3.4 | 5.4 | -36 | 5.9 | -41 |
| 29 | Denver-Aurora, CO | 4.0 | 5.6 | -28 | 6.6 | -39 |
| 30 | Minneapolis-St. Paul-Bloomington, MN-WI | 4.5 | 6.6 | -31 | 7.4 | -39 |
| 31 | Philadelphia, PA (MSAD) | 5.0 | 7.1 | -29 | 8.2 | -39 |
| 32 | Milwaukee-Waukesha-West Allis, WI | 3.7 | 5.2 | -29 | 6.0 | -38 |
| 33 | Orlando, FL | 4.5 | 7.0 | -35 | 7.3 | -38 |
| 34 | New Haven-Milford, CT | 3.7 | 5.4 | -31 | 6.0 | -38 |
| 35 | Salt Lake City, UT | 4.5 | 6.2 | -27 | 7.1 | -37 |
| 36 | Detroit-Livonia-Dearborn, MI (MSAD) | 5.9 | 7.8 | -24 | 9.0 | -35 |
| 37 | Hartford-West Hartford-East Hartford, CT | 4.0 | 4.9 | -18 | 5.5 | -27 |
| 38 | Nashville-Davidson-Murfreesboro, TN | 5.2 | 6.5 | -20 | 6.9 | -25 |
| 39 | Albuquerque, NM | 4.9 | 6.0 | -17 | 6.5 | -24 |
| 40 | Kansas City, MO-KS | 5.2 | 6.1 | -16 | 6.7 | -23 |
| 41 | St. Louis, MO-IL | 6.5 | 7.5 | -13 | 8.4 | -22 |
| 42 | Columbus, OH | 5.3 | 6.1 | -12 | 6.8 | -21 |
| 43 | Atlanta-Sandy Springs-Marietta, GA | 6.1 | 7.2 | -15 | 7.8 | -21 |
| 44 | Pittsburgh, PA | 7.0 | 7.7 | -9 | 8.9 | -21 |
| 45 | Colorado Springs, CO | 4.4 | 5.4 | -17 | 5.5 | -19 |
| 46 | Cleveland-Elyria-Mentor, OH | 6.0 | 6.7 | -10 | 7.4 | -19 |
| 47 | New Orleans-Metairie-Kenner, LA | 5.8 | 7.0 | -17 | 7.0 | -18 |
| 48 | Buffalo-Niagara Falls, NY | 8.1 | 8.6 | -6 | 9.8 | -18 |
| 49 | Cincinnati-Middletown, OH-KY-IN | 5.4 | 6.0 | -9 | 6.6 | -17 |
| 50 | Cedar Rapids, IA | 5.6 | 6.6 | -16 | 6.6 | -16 |
| 51 | Omaha-Council Bluffs, NE-IA | 6.0 | 6.9 | -12 | 7.1 | -15 |
| 52 | Indianapolis, IN | 6.8 | 7.1 | -4 | 7.7 | -11 |
| 53 | Charlotte-Gastonia-Concord, NC-SC | 5.2 | 4.9 | 5 | 5.8 | -10 |
| 54 | Austin-Round Rock, TX | 6.9 | 7.4 | -6 | 7.7 | -10 |
| 55 | Memphis, TN-MS-AR | 5.6 | 5.5 | 1 | 6.0 | -7 |
| 56 | Greensboro-High Point, NC | 5.4 | 5.4 | 2 | 5.8 | -7 |
| 57 | Houston-Baytown-Sugar Land, TX | 6.3 | 6.9 | -8 | 6.8 | -7 |
| 58 | San Antonio, TX | 6.6 | 7.0 | -5 | 6.6 | 0 |
| 59 | Dallas-Plano-Irving, TX (MSAD) | 7.6 | 7.3 | 4 | 7.2 | 5 |

Source: HSBC

HSBC

# 7.3. Ex-post housing risk premium: states

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| | United States (median) | 4.6 | 5.7 | -19 | 5.6 | -17 |
| | United States (average)* | 3.9 | 4.9 | -21 | 4.8 | -20 |
| | | | | | | |
| | Total Bubble Zone | 3.9 | 5.0 | -22 | 5.2 | -24 |
| | Eastern Bubble Zone | 4.0 | 5.1 | -21 | 5.3 | -25 |
| | Western Bubble Zone | 4.1 | 5.1 | -20 | 5.2 | -21 |
| | Non-Bubble Zone | 4.0 | 4.4 | -9 | 4.1 | -3 |
| | | | | | | |
| **1** | Montana | 4.3 | 6.8 | -37 | 6.8 | **-36** |
| **2** | Florida | 4.3 | 6.9 | -38 | 6.6 | **-36** |
| **3** | Vermont | 5.4 | 7.3 | -27 | 7.9 | **-32** |
| **4** | Maine | 6.5 | 8.5 | -24 | 9.3 | **-31** |
| **5** | Arizona | 4.2 | 6.4 | -34 | 6.1 | **-30** |
| **6** | Wyoming | 4.4 | 7.0 | -38 | 6.3 | **-30** |
| **7** | Oregon | 4.1 | 5.9 | -31 | 5.8 | **-30** |
| **8** | District of Columbia | 6.1 | 8.9 | -32 | 8.7 | **-29** |
| **9** | Maryland | 4.0 | 5.5 | -27 | 5.6 | **-29** |
| **10** | Nevada | 4.1 | 6.2 | -34 | 5.7 | **-28** |
| **11** | Virginia | 3.8 | 4.9 | -23 | 5.2 | **-28** |
| **12** | Massachusetts | 6.3 | 7.5 | -17 | 8.6 | **-27** |
| **13** | Rhode Island | 5.2 | 6.8 | -24 | 7.0 | **-27** |
| **14** | Illinois | 4.9 | 6.4 | -23 | 6.7 | **-26** |
| **15** | Delaware | 4.1 | 5.3 | -22 | 5.5 | **-26** |
| **16** | California | 5.3 | 7.0 | -23 | 7.2 | **-26** |
| **17** | Washington | 4.7 | 5.9 | -21 | 6.3 | **-25** |
| **18** | New Jersey | 5.2 | 6.6 | -22 | 6.9 | **-25** |
| **19** | Minnesota | 5.5 | 7.2 | -23 | 7.1 | **-23** |
| **20** | New York | 5.7 | 6.6 | -15 | 7.3 | **-22** |
| **21** | Wisconsin | 4.4 | 5.7 | -22 | 5.6 | **-21** |
| **22** | New Hampshire | 6.2 | 7.5 | -18 | 7.8 | **-20** |
| **23** | Michigan | 5.8 | 7.0 | -17 | 7.2 | **-20** |
| **24** | Pennsylvania | 5.6 | 6.7 | -16 | 6.9 | **-18** |
| **25** | North Dakota | 5.1 | 6.9 | -27 | 6.2 | **-18** |
| **26** | Colorado | 4.7 | 5.7 | -17 | 5.7 | **-17** |
| **27** | Kentucky | 5.0 | 5.9 | -16 | 5.9 | **-16** |
| **28** | South Dakota | 6.1 | 7.5 | -19 | 7.3 | **-16** |
| **29** | Alaska | 3.7 | 4.6 | -19 | 4.4 | **-15** |
| **30** | Hawaii | 3.4 | 3.9 | -13 | 4.0 | **-14** |
| **31** | Connecticut | 4.8 | 5.5 | -12 | 5.6 | **-13** |
| **32** | Utah | 3.7 | 4.3 | -14 | 4.2 | **-12** |
| **33** | Iowa | 6.1 | 7.5 | -18 | 6.9 | **-11** |
| **34** | West Virginia | 4.5 | 5.5 | -17 | 5.1 | **-11** |
| **35** | Idaho | 4.0 | 4.8 | -16 | 4.4 | **-8** |
| **36** | South Carolina | 4.9 | 5.3 | -8 | 5.2 | **-5** |
| **37** | Tennessee | 5.1 | 5.4 | -6 | 5.3 | **-4** |
| **38** | Kansas | 5.5 | 6.7 | -17 | 5.7 | **-4** |
| **39** | New Mexico | 4.6 | 5.4 | -15 | 4.8 | **-4** |
| **40** | Missouri | 5.8 | 6.2 | -6 | 6.0 | **-3** |
| **41** | Oklahoma | 6.4 | 7.5 | -14 | 6.6 | **-3** |
| **42** | Georgia | 5.1 | 5.6 | -9 | 5.2 | **-2** |
| **43** | Alabama | 4.7 | 5.0 | -6 | 4.6 | **0** |
| **44** | Nebraska | 6.1 | 6.6 | -7 | 6.0 | **1** |
| **45** | Ohio | 5.0 | 5.1 | -3 | 4.9 | **2** |
| **46** | Arkansas | 5.9 | 6.5 | -10 | 5.7 | **3** |
| **47** | Louisiana | 5.4 | 6.2 | -13 | 5.2 | **3** |
| **48** | Mississippi | 6.7 | 6.8 | -1 | 6.3 | **6** |
| **49** | Indiana | 5.9 | 5.8 | 1 | 5.5 | **7** |
| **50** | North Carolina | 5.1 | 4.7 | 8 | 4.7 | **9** |
| **51** | Texas | 7.0 | 6.8 | 4 | 5.6 | **26** |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices.

HSBC

# 7.4. Ex-post housing risk premium: cities

| Rank | Area | Q3 2005 | 20yr average | Deviation from 20yr average (%) | 30yr average | Deviation from 30yr average (%) |
|---|---|---|---|---|---|---|
| 1 | Miami-Miami Beach-Kendall, FL (MSAD) | 3.5 | 5.8 | -39 | 5.8 | -39 |
| 2 | Palm Bay-Melbourne-Titusville, FL | 3.8 | 6.7 | -44 | 6.1 | -38 |
| 3 | Nassau-Suffolk, NY (MSAD) | 5.0 | 6.7 | -25 | 7.6 | -34 |
| 4 | Riverside-San Bernardino-Ontario, CA | 3.8 | 5.5 | -32 | 5.5 | -32 |
| 5 | Phoenix-Mesa-Scottdale, AZ | 4.3 | 6.5 | -34 | 6.1 | -29 |
| 6 | Baltimore-Towson, MD | 4.2 | 5.8 | -27 | 5.9 | -29 |
| 7 | Chicago-Naperville-Joliet, IL (MSAD) | 3.7 | 4.9 | -24 | 5.2 | -29 |
| 8 | Tucson, AZ | 3.6 | 5.3 | -32 | 4.9 | -27 |
| 9 | Portland-Vancouver-Beaverton, OR-WA | 3.8 | 5.3 | -28 | 5.3 | -27 |
| 10 | Tampa-St. Petersburg-Clearwater, FL | 4.8 | 6.8 | -30 | 6.5 | -26 |
| 11 | Virginia Beach-Norfolk-Newport News, VA-NC | 4.4 | 6.0 | -25 | 6.0 | -26 |
| 12 | Seattle-Bellevue-Everett, WA (MSAD) | 4.6 | 5.7 | -19 | 6.2 | -25 |
| 13 | Providence-New Bedford-Fall River, RI-MA | 4.6 | 5.8 | -21 | 6.1 | -24 |
| 14 | Sacramento-Arden-Arcade-Roseville, CA | 4.4 | 5.6 | -22 | 5.6 | -22 |
| 15 | Philadelphia, PA (MSAD) | 5.2 | 6.5 | -20 | 6.6 | -22 |
| 16 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 4.9 | 5.9 | -17 | 6.1 | -21 |
| 17 | Las Vegas-Paradise, NV | 2.8 | 4.4 | -35 | 3.6 | -21 |
| 18 | Charleston-North Charleston, SC | 3.7 | 4.9 | -25 | 4.6 | -20 |
| 19 | Minneapolis-St. Paul-Bloomington, MN-WI | 4.6 | 5.9 | -22 | 5.8 | -20 |
| 20 | Orlando, FL | 4.7 | 6.4 | -27 | 5.8 | -20 |
| 21 | Detroit-Livonia-Dearborn, MI (MSAD) | 5.7 | 6.8 | -16 | 7.1 | -20 |
| 22 | Edison, NJ (MSAD) | 5.3 | 6.5 | -18 | 6.6 | -19 |
| 23 | Salt Lake City, UT | 3.8 | 4.8 | -20 | 4.7 | -19 |
| 24 | Boston-Quincy, MA (MSAD) | 6.3 | 7.3 | -14 | 7.7 | -19 |
| 25 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 3.9 | 5.1 | -24 | 4.7 | -18 |
| 26 | Milwaukee-Waukesha-West Allis, WI | 2.7 | 3.5 | -23 | 3.2 | -18 |
| 27 | Denver-Aurora, CO | 4.3 | 5.1 | -16 | 5.2 | -17 |
| 28 | Newark-Union, NJ-PA (MSAD) | 4.0 | 4.7 | -15 | 4.8 | -16 |
| 29 | New York-Wayne-White Plains, NY-NJ (MSAD) | 4.5 | 4.9 | -8 | 5.4 | -16 |
| 30 | San Diego-Carlsbad-San Marcos, CA | 4.1 | 4.8 | -15 | 4.7 | -14 |
| 31 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 4.0 | 4.8 | -17 | 4.7 | -14 |
| 32 | New Haven-Milford, CT | 4.3 | 5.2 | -17 | 5.0 | -13 |
| 33 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 5.1 | 5.8 | -11 | 5.9 | -13 |
| 34 | Oakland-Fremont-Hayward, CA (MSAD) | 4.3 | 4.8 | -12 | 4.8 | -11 |
| 35 | Nashville-Davidson-Murfreesboro, TN | 3.8 | 4.3 | -13 | 4.0 | -5 |
| 36 | Honolulu, HI | 3.5 | 3.7 | -5 | 3.7 | -4 |
| 37 | Buffalo-Niagara Falls, NY | 6.7 | 6.5 | 3 | 6.9 | -2 |
| 38 | St. Louis, MO-IL | 5.7 | 5.9 | -4 | 5.8 | -2 |
| 39 | Cedar Rapids, IA | 4.5 | 4.8 | -6 | 4.5 | -2 |
| 40 | Pittsburgh, PA | 5.5 | 5.4 | 1 | 5.5 | -1 |
| 41 | Bridgeport-Stamford-Norwalk, CT | 3.2 | 3.2 | -2 | 3.1 | 1 |
| 42 | Atlanta-Sandy Springs-Marietta, GA | 4.8 | 5.1 | -6 | 4.7 | 2 |
| 43 | Hartford-West Hartford-East Hartford, CT | 3.9 | 4.0 | -3 | 3.8 | 4 |
| 44 | Albuquerque, NM | 3.8 | 4.1 | -7 | 3.7 | 4 |
| 45 | Kansas City, MO-KS | 3.7 | 3.9 | -6 | 3.5 | 6 |
| 46 | Columbus, OH | 4.0 | 4.0 | 0 | 3.7 | 8 |
| 47 | Cleveland-Elyria-Mentor, OH | 4.7 | 4.7 | 1 | 4.4 | 8 |
| 48 | New Orleans-Metairie-Kenner, LA | 4.2 | 4.6 | -10 | 3.8 | 11 |
| 49 | Omaha-Council Bluffs, NE-IA | 4.3 | 4.4 | -3 | 3.8 | 13 |
| 50 | Colorado Springs, CO | 3.5 | 3.7 | -5 | 3.0 | 15 |
| 51 | Cincinnati-Middletown, OH-KY-IN | 4.0 | 3.8 | 5 | 3.4 | 18 |
| 52 | Austin-Round Rock, TX | 5.9 | 5.6 | 5 | 5.0 | 18 |
| 53 | Indianapolis, IN | 5.3 | 4.9 | 9 | 4.5 | 19 |
| 54 | Charlotte-Gastonia-Concord, NC-SC | 4.0 | 3.0 | 34 | 2.9 | 38 |
| 55 | Memphis, TN-MS-AR | 3.7 | 2.9 | 27 | 2.5 | 50 |
| 56 | Greensboro-High Point, NC | 3.6 | 2.7 | 31 | 2.3 | 52 |
| 57 | Houston-Baytown-Sugar Land, TX | 3.8 | 3.6 | 5 | 2.5 | 53 |
| 58 | Dallas-Plano-Irving, TX (MSAD) | 5.9 | 4.8 | 22 | 3.8 | 57 |
| 59 | San Antonio, TX | 3.9 | 3.5 | 11 | 2.4 | 61 |

Source: HSBC

HSBC

# 7.5. Volatility-based housing risk premiums: states

| Rank | Area | Volatility-based housing risk premium | Ex-ante housing risk premium | Ex-post housing risk premium |
|---|---|---|---|---|
| | United States (average)* | 3.5 | 3.7 | 3.9 |
| | | | | |
| | Total Bubble Zone | 4.9 | 2.6 | 3.9 |
| | Eastern Bubble Zone | 5.0 | 3.2 | 4.0 |
| | Western Bubble Zone | 6.3 | 2.0 | 4.1 |
| | Non-Bubble Zone | 2.4 | 5.2 | 4.0 |
| | | | | |
| **1** | Hawaii | **8.9** | 2.0 | 3.4 |
| **2** | Rhode Island | **7.6** | 3.7 | 5.2 |
| **3** | California | **7.2** | 2.5 | 5.3 |
| **4** | Connecticut | **7.0** | 4.2 | 4.8 |
| **5** | District of Columbia | **6.9** | 3.8 | 6.1 |
| **6** | Massachusetts | **6.9** | 4.3 | 6.3 |
| **7** | New Hampshire | **6.8** | 5.4 | 6.2 |
| **8** | Alaska | **6.7** | 5.3 | 3.7 |
| **9** | New Jersey | **6.4** | 3.9 | 5.2 |
| **10** | Nevada | **6.4** | 3.5 | 4.1 |
| **11** | North Dakota | **6.3** | 6.9 | 5.1 |
| **12** | Wyoming | **6.1** | 5.3 | 4.4 |
| **13** | New York | **5.9** | 4.8 | 5.7 |
| **14** | Oregon | **5.6** | 3.5 | 4.1 |
| **15** | Arizona | **5.4** | 4.2 | 4.2 |
| **16** | Maine | **5.4** | 5.9 | 6.5 |
| **17** | Washington | **5.3** | 3.5 | 4.7 |
| **18** | Vermont | **5.0** | 5.7 | 5.4 |
| **19** | Montana | **5.0** | 4.6 | 4.3 |
| **20** | Florida | **4.9** | 4.5 | 4.3 |
| **21** | Maryland | **4.8** | 3.4 | 4.0 |
| **22** | Utah | **4.8** | 4.3 | 3.7 |
| **23** | Colorado | **4.6** | 4.5 | 4.7 |
| **24** | Louisiana | **4.5** | 7.0 | 5.4 |
| **25** | Delaware | **4.4** | 4.2 | 4.1 |
| **26** | Oklahoma | **4.4** | 8.5 | 6.4 |
| **27** | Michigan | **4.4** | 6.4 | 5.8 |
| **28** | South Dakota | **4.3** | 7.6 | 6.1 |
| **29** | Virginia | **4.3** | 3.7 | 3.8 |
| **30** | West Virginia | **4.2** | 6.8 | 4.5 |
| **31** | Iowa | **4.0** | 7.8 | 6.1 |
| **32** | Wisconsin | **3.9** | 5.3 | 4.4 |
| **33** | Minnesota | **3.8** | 5.6 | 5.5 |
| **34** | Pennsylvania | **3.8** | 6.3 | 5.6 |
| **35** | Idaho | **3.7** | 5.2 | 4.0 |
| **36** | Texas | **3.7** | 9.1 | 7.0 |
| **37** | New Mexico | **3.7** | 5.5 | 4.6 |
| **38** | Illinois | **3.6** | 5.5 | 4.9 |
| **39** | Missouri | **3.3** | 7.2 | 5.8 |
| **40** | Mississippi | **3.1** | 9.1 | 6.7 |
| **41** | Arkansas | **3.1** | 7.6 | 5.9 |
| **42** | Kansas | **3.1** | 7.4 | 5.5 |
| **43** | Ohio | **2.9** | 6.4 | 5.0 |
| **44** | Nebraska | **2.8** | 7.8 | 6.1 |
| **45** | Indiana | **2.8** | 7.5 | 5.9 |
| **46** | Kentucky | **2.6** | 6.5 | 5.0 |
| **47** | Georgia | **2.4** | 6.6 | 5.1 |
| **48** | Tennessee | **2.4** | 6.7 | 5.1 |
| **49** | Alabama | **2.4** | 6.5 | 4.7 |
| **50** | South Carolina | **2.2** | 6.3 | 4.9 |
| **51** | North Carolina | **2.0** | 6.4 | 5.1 |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices.

HSBC

# 7.6. Volatility-based housing risk premiums: cities

| Rank | Area | Volatility-based housing risk premium | Ex-ante housing risk premium | Ex-post housing risk premium |
|---|---|---|---|---|
| 1 | Honolulu, HI | 9.2 | 1.8 | 3.5 |
| 2 | Riverside-San Bernardino-Ontario, CA | 8.1 | 2.0 | 3.8 |
| 3 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 8.1 | 2.0 | 4.9 |
| 4 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 7.8 | 1.4 | 4.0 |
| 5 | New Haven-Milford, CT | 7.8 | 3.7 | 4.3 |
| 6 | San Diego-Carlsbad-San Marcos, CA | 7.6 | 1.5 | 4.1 |
| 7 | Bridgeport-Stamford-Norwalk, CT | 7.6 | 1.8 | 3.2 |
| 8 | Providence-New Bedford-Fall River, RI-MA | 7.5 | 3.0 | 4.6 |
| 9 | Nassau-Suffolk, NY (MSAD) | 7.4 | 2.8 | 5.0 |
| 10 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 7.4 | 2.0 | 5.1 |
| 11 | Sacramento-Arden-Arcade-Roseville, CA | 7.3 | 2.4 | 4.4 |
| 12 | Boston-Quincy, MA (MSAD) | 7.2 | 3.5 | 6.3 |
| 13 | Edison, NJ (MSAD) | 7.2 | 3.7 | 5.3 |
| 14 | Las Vegas-Paradise, NV | 7.0 | 2.9 | 2.8 |
| 15 | Hartford-West Hartford-East Hartford, CT | 7.0 | 4.0 | 3.9 |
| 16 | Palm Bay-Melbourne-Titusville, FL | 6.9 | 3.8 | 3.8 |
| 17 | Oakland-Fremont-Hayward, CA (MSAD) | 6.9 | 1.3 | 4.3 |
| 18 | New York-Wayne-White Plains, NY-NJ (MSAD) | 6.7 | 2.2 | 4.5 |
| 19 | Newark-Union, NJ-PA (MSAD) | 6.6 | 2.3 | 4.0 |
| 20 | Seattle-Bellevue-Everett, WA (MSAD) | 6.4 | 2.7 | 4.6 |
| 21 | Charleston-North Charleston, SC | 6.0 | 3.4 | 3.7 |
| 22 | Phoenix-Mesa-Scottdale, AZ | 5.9 | 4.0 | 4.3 |
| 23 | Miami-Miami Beach-Kendall, FL (MSAD) | 5.8 | 2.6 | 3.5 |
| 24 | Austin-Round Rock, TX | 5.7 | 6.9 | 5.9 |
| 25 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 5.6 | 2.9 | 3.9 |
| 26 | Tucson, AZ | 5.6 | 3.4 | 3.6 |
| 27 | Portland-Vancouver-Beaverton, OR-WA | 5.5 | 3.3 | 3.8 |
| 28 | Detroit-Livonia-Dearborn, MI (MSAD) | 5.4 | 5.9 | 5.7 |
| 29 | Denver-Aurora, CO | 5.2 | 4.0 | 4.3 |
| 30 | Salt Lake City, UT | 4.9 | 4.5 | 3.8 |
| 31 | Philadelphia, PA (MSAD) | 4.9 | 5.0 | 5.2 |
| 32 | Orlando, FL | 4.8 | 4.5 | 4.7 |
| 33 | Tampa-St. Petersburg-Clearwater, FL | 4.7 | 4.7 | 4.8 |
| 34 | Virginia Beach-Norfolk-Newport News, VA-NC | 4.7 | 4.4 | 4.4 |
| 35 | Baltimore-Towson, MD | 4.6 | 3.8 | 4.2 |
| 36 | Houston-Baytown-Sugar Land, TX | 4.5 | 6.3 | 3.8 |
| 37 | New Orleans-Metairie-Kenner, LA | 4.5 | 5.8 | 4.2 |
| 38 | San Antonio, TX | 4.2 | 6.6 | 3.9 |
| 39 | Dallas-Plano-Irving, TX (MSAD) | 4.2 | 7.6 | 5.9 |
| 40 | Minneapolis-St. Paul-Bloomington, MN-WI | 4.1 | 4.5 | 4.6 |
| 41 | Chicago-Naperville-Joliet, IL (MSAD) | 4.0 | 3.8 | 3.7 |
| 42 | Colorado Springs, CO | 3.9 | 4.4 | 3.5 |
| 43 | Milwaukee-Waukesha-West Allis, WI | 3.7 | 3.7 | 2.7 |
| 44 | Buffalo-Niagara Falls, NY | 3.7 | 8.1 | 6.7 |
| 45 | St. Louis, MO-IL | 3.7 | 6.5 | 5.7 |
| 46 | Cleveland-Elyria-Mentor, OH | 3.4 | 6.0 | 4.7 |
| 47 | Kansas City, MO-KS | 3.4 | 5.2 | 3.7 |
| 48 | Pittsburgh, PA | 3.3 | 7.0 | 5.5 |
| 49 | Albuquerque, NM | 3.3 | 4.9 | 3.8 |
| 50 | Nashville-Davidson-Murfreesboro, TN | 3.2 | 5.2 | 3.8 |
| 51 | Cincinnati-Middletown, OH-KY-IN | 2.9 | 5.4 | 4.0 |
| 52 | Memphis, TN-MS-AR | 2.7 | 5.6 | 3.7 |
| 53 | Atlanta-Sandy Springs-Marietta, GA | 2.6 | 6.1 | 4.8 |
| 54 | Indianapolis, IN | 2.5 | 6.8 | 5.3 |
| 55 | Omaha-Council Bluffs, NE-IA | 2.5 | 6.0 | 4.3 |
| 56 | Columbus, OH | 2.4 | 5.3 | 4.0 |
| 57 | Greensboro-High Point, NC | 2.2 | 5.4 | 3.6 |
| 58 | Charlotte-Gastonia-Concord, NC-SC | 2.2 | 5.2 | 4.0 |
| 59 | Cedar Rapids, IA | 2.0 | 5.6 | 4.5 |

Source: HSBC

HSBC

# 8. Required capital gains

- If you know what the expected cost of owning versus renting is for an assumed holding period…
- …and you know what housing risk premium you want to use…
- …you can back out what home price appreciation is required to financially justify buying versus renting

## What's priced in?

*The previous section made assumptions about future rental income growth so we could observe how risk premiums might be changing. This section investigates the other side of the coin, making assumptions about risk premiums so we can observe how expected housing capital gains, linked to future rental income growth, might have changed.*

By utilizing both the information we gathered on the expected cost of homeownership versus the expected cost of renting over an assumed holding period (F-HOC-R in section 5), together with the housing risk premium (section 7), we can calculate estimates of the required future growth rate in house prices that is needed to financially justify buying versus renting. For our purposes here, we assume a seven year holding period, but *Home*Pulse users can change this assumption.

These calculations take into account closing costs at the time of purchase (we assume 5% of the house value) and selling costs at the time of sale (4%). *Home*Pulse users can change these to their own preferred assumptions, but note that US closing and selling costs do tend to be high relative to many other countries, although costs do vary across the US too. (One could argue that selling costs in a few years will be reduced as the Internet forces broker commissions down.)

When considering the "right" required price appreciation to financially justify buying, we need to know what housing risk premium is appropriate, and we use four methods here to give a range of outcomes:

- The forward looking (ex-ante) housing risk premium (20-year average). We think this is probably the most sensible approach for most housing markets.
- The backward looking (ex-post) housing risk premium, based on past excess returns on housing (20-year average). This probably gives too high a risk premium for most "hot" housing markets than is justified, and hence makes today's housing market look more expensive than it really is.
- A price volatility-based risk premium, which seems to rationally make a lot of sense to us.
- A zero-risk premium, based on the assumption that people view housing as a place to live and not as an investment. The assumption is that people behave as if buying

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a house is risk-free despite it being a typically highly leveraged purchase (this is the least useful approach and historical returns suggest homeowners do not act this way).

## Using an ex-ante risk premium

Using the ex-ante housing risk premium (we use the 20-year average), the required real house price growth per annum in the US is 5¾% (8¼% nominal). This compares with a 30-year average of 3.3%.

For the bubble zone, the required real price gain per year is 6% (8½% nominal), the highest in its history too, and well beyond any reasonable estimate of trend GDP and income growth. On this basis, Wyoming, Montana and Minnesota make it into the top 10 priciest markets, even though they are not official members of our bubble zone. North Carolina, Mississippi and Texas have the lowest price growth required to financially justify buying. See tables 8.1 and 8.2 for states and cities listed and ranked by highest to lowest required price appreciation rates.

(We wouldn't put too much emphasis on the precise required growth being spat out by *Home*Pulse, given we acknowledge some of our estimates of house prices and rents may not be perfectly comparable, although we have made efforts to do so. One can have more confidence, however, in looking at today's reading relative to the past as an indication of current valuation.)

## Using an ex-post risk premium

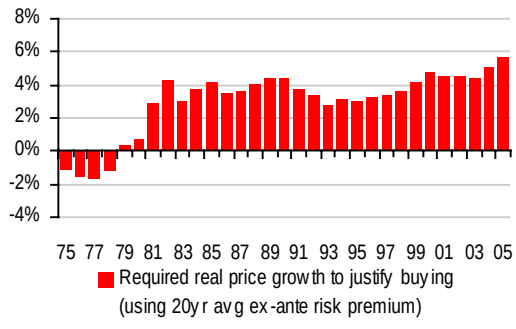
Using an ex-post, or backward looking risk premium, the US average real required capital gain per annum is 5.2%, well above the 30-year average of 2.8%. DC, California and Massachusetts top the league here, with required real price growth rates of 9%, 8.4% and 7.3%, respectively. Texas is cheapest at 0.9%, while Michigan is in the middle of the pack at 4.6% (but far ahead of its long-run average of 1.2%).

Among cities, Boston, San Francisco and Los Angeles are towards the highest, but those that have high price gains required relative to their 20-year averages include Nassau-Suffolk, Riverside, Miami, Palm Bay, Phoenix, Tampa, Baltimore, Tucson, Orlando, Las Vegas, and surprisingly, Detroit. Should the auto industry's troubles deteriorate further, house prices in this city could be under pressure. See tables 8.3 and 8.4 for more.

## Using a volatility-based risk premium

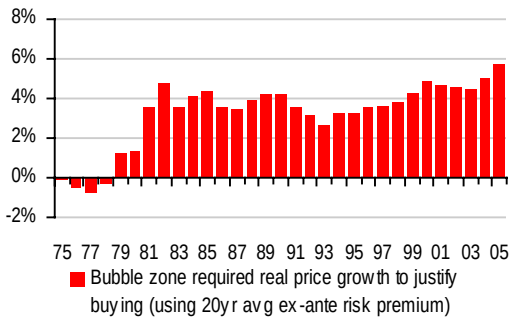
Tables 8.5 and 8.6 show the state and city rankings respectively for required capital gains based on price-volatility based risk premiums. For the US, the required price gain is 3.7% compared with a 30-year average of 2.5%, a 47% deviation, suggesting that expected price gains may be unrealistic.

**8A. Required capital gains for the US**




Source: HSBC

**8B. Required capital gains for the bubble zone**

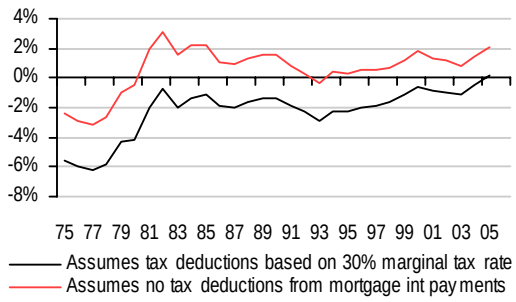



Source: HSBC

## Using a zero-risk premium

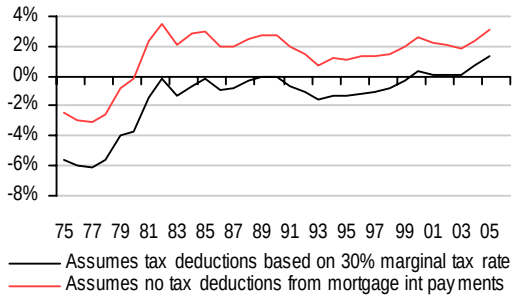
Our fourth and final approach assumes a zero-risk premium.

**8C. Required real price growth to justify buying (using zero-risk premium)**




Source: HSBC

**8D. Bubble zone required real price growth to justify buying (using zero-risk premium)**




Source: HSBC

Initially, the results appear crazy. Median US house prices apparently only need to rise in real terms by ½% per annum (for a planned holding period of seven years) to justify buying versus renting, or by 3% per year in nominal terms. And as chart 8C shows, the required real returns before this year were negative for all of the past thirty years, if one assumes tax relief at a marginal tax rate of 30%.

More reasonable results are attained when assuming no tax relief on interest payments, a more useful guide for the US median given that two-thirds of tax filers just take the standard deduction and do not itemize deductions to take advantage of the tax relief.

For the bubble zone, the required real price gain is only 1½%, or 4% in nominal terms (again assuming tax relief at a 30% rate). And much of the history has also required negative price growth. What's going on?

Could it be that house prices in the past 30 years that we have data for have always been ridiculously cheap and that it is only now that house prices are moving towards (but have not yet reached) fair values?

Not likely. These calculations assume *a zero housing risk premium*. But who cares about a risk premium? After all, this is a home, not an investment.

Unfortunately, this is the equivalent of saying that if you hold stocks for a long enough time period (a few decades), and you are sufficiently diversified, then history (well, US history anyway) shows that stocks have proven to be no riskier than bonds, and therefore one should apply a zero-risk premium to stocks.

On this basis, today's Dow Jones Industrials Index should be north of 50,000 instead of 11,000, taking the PE ratio from 19 times to about 100 times or more. Of course, many did start to think that way in the late 1990s, with the publication of *Dow 36,000*, one of the more notable book titles of the tech-bubble era.

The same applies to housing. With a zero-risk premium, one could argue that house prices are still too cheap. But as we showed in section 7, a housing risk premium must exist, in line with sensible thinking and the empirical evidence across all of our 150 metro areas and 50 states in *Home*Pulse.

## Are higher growth expectations justified?

The required capital gains to justify buying versus renting should also broadly reflect expectations of future rental income growth, or the growth in future rent saved in the case of an owner-occupier (the G in the Gordon growth equation *RFR + RP = NRY + G*).

Strong productivity growth might result in higher real wage growth to help support stronger rental income growth. We're not sure this argument stacks up. Rents account for 30% of the CPI, and interest rates have declined because of lower expected inflation, of which rents are a big component. If anything, rent inflation expectations have declined too. It is worth noting that many of the hottest markets have had little rent inflation in recent years. If rent inflation were to accelerate in future years, it would completely obliterate the Fed's ability to keep inflation at 1-2%, given the high weight of rents in the CPI. This would presumably raise rates and hurt housing values.

Another popular reason that at first glance supports strong future rent growth is a lack of housing supply on the coasts, due to physical constraints and tougher zoning regulations. But this "restricted supply" argument should have pushed up rents too in affected areas, reflecting that lack of supply. So prices may have overshot supply fundamentals anyway.

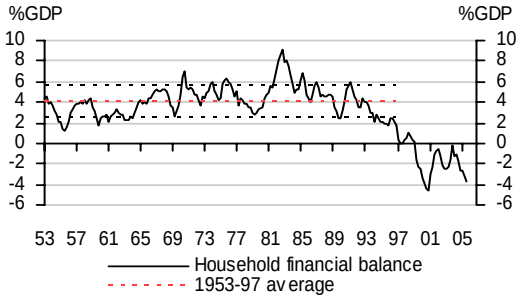
Immigration and demographics are also popular reasons that should push up house prices. Again, this should push up rents too, so it is not obvious the price-rent ratio should rise. Immigration and population growth are good structural factors supporting housing, but you can still have periods of overvaluation. A strong acceleration in immigration growth in the early 1990s could not stop the Pacific and Northeast housing markets from going bust for a few years, for instance.

Lower capital gains taxes would push up the after-tax return on housing. Much has been made of the 1997 tax reform act that allows for the first USD250,000 in capital gains on a primary residence to be tax-free (USD500,000 for a married couple).

But as Appendix B makes clear, this was not a substantial development because "rollover" laws that existed before 1997 meant that little capital gains taxes were paid on owner-occupied homes before 1997 anyway. Indeed, the 1997 reform was partially a tax-simplification initiative and enacted partly because the previous policy was complicated and did not generate much tax revenue.

At the end of the day, if one assumes a high enough growth rate or low enough risk premium, any price can be justified. This was the case in the late 1990s with stocks. With the benefit of hindsight, the corporate borrowing binge associated with a large corporate financing gap was a sign of overinvestment. In recent years, mortgage borrowing has boomed and the US household financial balance has been in deficit, signs of possible real estate overinvestment. If so, elevated expected future capital gains (and/or lower risk premiums) likely will prove unsustainable.

**8E. Household financial balance is in deficit**




Source: HSBC, Datastream, Federal Reserve, Bureau of Economic Analysis

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# 8.1. Required real capital gains using ex-ante HRP**: states

| Rank | Area | Required real price growth per annum | 20yr average | Deviation from 20yr average (ppt) | 30yr average | Deviation from 30yr average (ppt) |
|---|---|---|---|---|---|---|
| | United States (median) | 5.8 | 3.9 | 1.9 | 3.3 | 2.5 |
| | United States (average)* | 5.8 | 4.0 | 1.8 | 3.4 | 2.4 |
| | | | | | | |
| | Total Bubble Zone | 5.7 | 4.0 | 1.8 | 3.2 | 2.6 |
| | Eastern Bubble Zone | 5.8 | 4.0 | 1.8 | 3.0 | 2.8 |
| | Western Bubble Zone | 5.6 | 4.0 | 1.7 | 3.2 | 2.4 |
| | Non-Bubble Zone | 5.2 | 3.9 | 1.3 | 3.6 | 1.6 |
| | | | | | | |
| **1** | District of Columbia | **7.5** | 3.7 | 3.7 | 3.3 | 4.1 |
| **2** | Wyoming | **7.3** | 3.3 | 4.0 | 3.6 | 3.7 |
| **3** | Montana | **7.3** | 3.5 | 3.7 | 3.0 | 4.3 |
| **4** | Florida | **7.2** | 3.7 | 3.5 | 3.3 | 3.9 |
| **5** | Nevada | **6.9** | 3.9 | 2.9 | 3.8 | 3.0 |
| **6** | Maine | **6.7** | 3.4 | 3.3 | 1.4 | 5.3 |
| **7** | Arizona | **6.6** | 3.8 | 2.8 | 3.4 | 3.2 |
| **8** | Vermont | **6.6** | 3.5 | 3.0 | 2.0 | 4.5 |
| **9** | Oregon | **6.5** | 3.9 | 2.6 | 3.4 | 3.1 |
| **10** | Minnesota | **6.5** | 3.6 | 2.8 | 3.0 | 3.4 |
| **11** | Rhode Island | **6.4** | 3.9 | 2.5 | 2.9 | 3.5 |
| **12** | North Dakota | **6.4** | 3.2 | 3.2 | 3.5 | 2.9 |
| **13** | California | **6.3** | 4.0 | 2.3 | 3.1 | 3.2 |
| **14** | Illinois | **6.2** | 3.7 | 2.5 | 2.7 | 3.6 |
| **15** | New Jersey | **6.2** | 3.9 | 2.3 | 2.9 | 3.3 |
| **16** | Maryland | **6.1** | 4.0 | 2.2 | 3.1 | 3.0 |
| **17** | Massachusetts | **6.1** | 3.9 | 2.2 | 1.7 | 4.4 |
| **18** | New Hampshire | **6.1** | 3.7 | 2.4 | 2.7 | 3.4 |
| **19** | Wisconsin | **6.0** | 3.8 | 2.2 | 3.2 | 2.8 |
| **20** | Michigan | **6.0** | 3.5 | 2.4 | 2.5 | 3.5 |
| **21** | Washington | **6.0** | 4.0 | 2.0 | 2.9 | 3.0 |
| **22** | South Dakota | **5.9** | 3.1 | 2.8 | 2.7 | 3.2 |
| **23** | Delaware | **5.8** | 3.9 | 1.9 | 2.9 | 2.9 |
| **24** | Colorado | **5.8** | 3.9 | 1.9 | 3.2 | 2.6 |
| **25** | Virginia | **5.8** | 4.0 | 1.8 | 2.9 | 2.9 |
| **26** | Iowa | **5.8** | 3.0 | 2.8 | 3.1 | 2.7 |
| **27** | New York | **5.7** | 3.9 | 1.8 | 2.4 | 3.4 |
| **28** | Kansas | **5.7** | 3.2 | 2.5 | 3.7 | 2.0 |
| **29** | Pennsylvania | **5.7** | 3.6 | 2.0 | 2.7 | 3.0 |
| **30** | Kentucky | **5.6** | 3.6 | 2.0 | 2.9 | 2.7 |
| **31** | Alaska | **5.6** | 3.9 | 1.7 | 3.4 | 2.2 |
| **32** | West Virginia | **5.5** | 3.5 | 1.9 | 3.4 | 2.1 |
| **33** | New Mexico | **5.5** | 3.8 | 1.6 | 3.9 | 1.6 |
| **34** | Connecticut | **5.4** | 3.9 | 1.5 | 3.2 | 2.3 |
| **35** | Louisiana | **5.4** | 3.5 | 1.9 | 3.9 | 1.5 |
| **36** | Idaho | **5.4** | 3.9 | 1.5 | 3.7 | 1.7 |
| **37** | Utah | **5.3** | 4.0 | 1.4 | 3.4 | 2.0 |
| **38** | Oklahoma | **5.3** | 2.8 | 2.5 | 3.3 | 2.0 |
| **39** | Georgia | **5.2** | 3.7 | 1.4 | 3.4 | 1.7 |
| **40** | South Carolina | **5.1** | 3.8 | 1.3 | 3.3 | 1.8 |
| **41** | Hawaii | **5.1** | 3.9 | 1.2 | 3.2 | 1.9 |
| **42** | Arkansas | **5.0** | 3.4 | 1.7 | 3.7 | 1.4 |
| **43** | Missouri | **5.0** | 3.6 | 1.4 | 3.2 | 1.8 |
| **44** | Tennessee | **5.0** | 3.7 | 1.2 | 3.2 | 1.8 |
| **45** | Alabama | **4.9** | 3.8 | 1.2 | 3.5 | 1.5 |
| **46** | Nebraska | **4.9** | 3.4 | 1.5 | 3.3 | 1.6 |
| **47** | Ohio | **4.9** | 3.8 | 1.1 | 3.4 | 1.5 |
| **48** | Indiana | **4.5** | 3.6 | 0.9 | 3.4 | 1.1 |
| **49** | North Carolina | **4.3** | 3.9 | 0.4 | 3.3 | 1.1 |
| **50** | Mississippi | **4.1** | 3.0 | 1.1 | 3.0 | 1.2 |
| **51** | Texas | **3.7** | 3.1 | 0.6 | 3.9 | -0.2 |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices. **HRP = housing risk premium.

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# 8.2. Required real capital gains using ex-ante HRP: cities

| Rank | Area | Required real price growth | 20yr average | Deviation from 20yr average (ppt) | 30yr average | Deviation from 30yr average (ppt) |
|---|---|---|---|---|---|---|
| 1 | Palm Bay-Melbourne-Titusville, FL | 7.5 | 3.7 | 3.8 | 3.9 | 3.7 |
| 2 | Miami-Miami Beach-Kendall, FL (MSAD) | 6.8 | 4.0 | 2.9 | 3.3 | 3.6 |
| 3 | Phoenix-Mesa-Scottdale, AZ | 6.6 | 3.8 | 2.8 | 3.6 | 3.0 |
| 4 | Tampa-St. Petersburg-Clearwater, FL | 6.6 | 3.7 | 2.9 | 3.5 | 3.2 |
| 5 | Nassau-Suffolk, NY (MSAD) | 6.4 | 3.9 | 2.5 | 2.2 | 4.2 |
| 6 | Riverside-San Bernardino-Ontario, CA | 6.3 | 4.0 | 2.4 | 3.3 | 3.0 |
| 7 | Baltimore-Towson, MD | 6.3 | 3.9 | 2.3 | 3.1 | 3.2 |
| 8 | Las Vegas-Paradise, NV | 6.3 | 4.0 | 2.3 | 4.1 | 2.1 |
| 9 | Tucson, AZ | 6.2 | 4.0 | 2.3 | 3.6 | 2.6 |
| 10 | Orlando, FL | 6.2 | 3.8 | 2.4 | 3.8 | 2.4 |
| 11 | Portland-Vancouver-Beaverton, OR-WA | 6.2 | 3.9 | 2.2 | 3.3 | 2.8 |
| 12 | Virginia Beach-Norfolk-Newport News, VA-NC | 6.1 | 3.9 | 2.2 | 3.2 | 2.9 |
| 13 | Minneapolis-St. Paul-Bloomington, MN-WI | 6.1 | 3.9 | 2.2 | 3.3 | 2.8 |
| 14 | Philadelphia, PA (MSAD) | 6.0 | 3.8 | 2.2 | 3.0 | 3.0 |
| 15 | Detroit-Livonia-Dearborn, MI (MSAD) | 6.0 | 3.7 | 2.3 | 2.6 | 3.4 |
| 16 | Chicago-Naperville-Joliet, IL (MSAD) | 5.9 | 4.0 | 2.0 | 2.9 | 3.0 |
| 17 | Providence-New Bedford-Fall River, RI-MA | 5.9 | 4.0 | 2.0 | 3.1 | 2.9 |
| 18 | Charleston-North Charleston, SC | 5.9 | 4.0 | 2.0 | 3.7 | 2.3 |
| 19 | Edison, NJ (MSAD) | 5.9 | 3.9 | 2.0 | 3.1 | 2.8 |
| 20 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 5.9 | 4.0 | 1.9 | 3.7 | 2.2 |
| 21 | Boston-Quincy, MA (MSAD) | 5.9 | 4.0 | 1.9 | 2.8 | 3.0 |
| 22 | Sacramento-Arden-Arcade-Roseville, CA | 5.9 | 4.0 | 1.9 | 3.3 | 2.6 |
| 23 | Seattle-Bellevue-Everett, WA (MSAD) | 5.7 | 4.0 | 1.8 | 2.8 | 3.0 |
| 24 | Salt Lake City, UT | 5.7 | 3.9 | 1.8 | 3.3 | 2.4 |
| 25 | Denver-Aurora, CO | 5.7 | 4.0 | 1.7 | 3.2 | 2.5 |
| 26 | New Haven-Milford, CT | 5.7 | 3.9 | 1.7 | 3.6 | 2.1 |
| 27 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 5.6 | 3.9 | 1.7 | 3.0 | 2.6 |
| 28 | Milwaukee-Waukesha-West Allis, WI | 5.6 | 4.0 | 1.6 | 3.6 | 2.0 |
| 29 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 5.4 | 3.9 | 1.5 | 3.4 | 2.0 |
| 30 | Newark-Union, NJ-PA (MSAD) | 5.4 | 3.9 | 1.4 | 3.2 | 2.2 |
| 31 | Nashville-Davidson-Murfreesboro, TN | 5.3 | 3.9 | 1.4 | 3.7 | 1.7 |
| 32 | San Diego-Carlsbad-San Marcos, CA | 5.3 | 3.9 | 1.4 | 3.3 | 2.0 |
| 33 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 5.3 | 3.9 | 1.4 | 3.2 | 2.1 |
| 34 | New Orleans-Metairie-Kenner, LA | 5.2 | 3.9 | 1.3 | 4.1 | 1.1 |
| 35 | Cedar Rapids, IA | 5.2 | 3.9 | 1.3 | 3.8 | 1.3 |
| 36 | Oakland-Fremont-Hayward, CA (MSAD) | 5.1 | 3.9 | 1.2 | 3.3 | 1.8 |
| 37 | Atlanta-Sandy Springs-Marietta, GA | 5.1 | 3.8 | 1.3 | 3.6 | 1.5 |
| 38 | Kansas City, MO-KS | 5.0 | 4.0 | 1.1 | 3.7 | 1.3 |
| 39 | New York-Wayne-White Plains, NY-NJ (MSAD) | 5.0 | 3.9 | 1.1 | 2.8 | 2.2 |
| 40 | Colorado Springs, CO | 5.0 | 4.0 | 1.0 | 4.0 | 1.0 |
| 41 | Albuquerque, NM | 4.9 | 4.0 | 1.0 | 3.7 | 1.2 |
| 42 | St. Louis, MO-IL | 4.9 | 3.8 | 1.1 | 3.2 | 1.7 |
| 43 | Hartford-West Hartford-East Hartford, CT | 4.9 | 4.0 | 0.9 | 3.6 | 1.3 |
| 44 | Omaha-Council Bluffs, NE-IA | 4.9 | 3.9 | 1.0 | 3.9 | 1.0 |
| 45 | Columbus, OH | 4.8 | 4.0 | 0.9 | 3.6 | 1.2 |
| 46 | Cleveland-Elyria-Mentor, OH | 4.7 | 3.9 | 0.8 | 3.6 | 1.2 |
| 47 | Honolulu, HI | 4.7 | 3.9 | 0.9 | 3.3 | 1.4 |
| 48 | Bridgeport-Stamford-Norwalk, CT | 4.7 | 3.9 | 0.9 | 3.3 | 1.4 |
| 49 | Cincinnati-Middletown, OH-KY-IN | 4.6 | 4.0 | 0.7 | 3.7 | 0.9 |
| 50 | Houston-Baytown-Sugar Land, TX | 4.6 | 3.9 | 0.8 | 4.4 | 0.2 |
| 51 | Pittsburgh, PA | 4.6 | 3.7 | 0.9 | 2.9 | 1.7 |
| 52 | Austin-Round Rock, TX | 4.3 | 3.8 | 0.5 | 3.8 | 0.5 |
| 53 | Indianapolis, IN | 4.2 | 3.8 | 0.4 | 3.6 | 0.6 |
| 54 | San Antonio, TX | 4.2 | 3.8 | 0.4 | 4.4 | -0.1 |
| 55 | Buffalo-Niagara Falls, NY | 4.1 | 3.5 | 0.6 | 2.3 | 1.8 |
| 56 | Greensboro-High Point, NC | 4.0 | 4.0 | 0.0 | 3.7 | 0.2 |
| 57 | Memphis, TN-MS-AR | 4.0 | 4.0 | 0.0 | 3.8 | 0.2 |
| 58 | Charlotte-Gastonia-Concord, NC-SC | 3.8 | 4.0 | -0.2 | 3.4 | 0.4 |
| 59 | Dallas-Plano-Irving, TX (MSAD) | 3.5 | 3.8 | -0.3 | 4.2 | -0.7 |

Source: HSBC

HSBC

# 8.3. Required real capital gains using ex-post HRP: states

| Rank | Area | Required real price growth | 20yr average | Deviation from 20yr average (ppt) | 30yr average | Deviation from 30yr average (ppt) |
|---|---|---|---|---|---|---|
| | United States (median) | 4.9 | 2.9 | 1.9 | 2.4 | 2.5 |
| | United States (average)* | 5.2 | 3.4 | 1.8 | 2.8 | 2.4 |
| | | | | | | |
| | Total Bubble Zone | 6.3 | 4.6 | 1.8 | 3.7 | 2.6 |
| | Eastern Bubble Zone | 5.8 | 4.0 | 1.8 | 3.1 | 2.8 |
| | Western Bubble Zone | 7.0 | 5.3 | 1.7 | 4.6 | 2.4 |
| | Non-Bubble Zone | 3.2 | 1.9 | 1.3 | 1.6 | 1.6 |
| | | | | | | |
| **1** | District of Columbia | **9.0** | 5.3 | 3.7 | 4.9 | 4.1 |
| **2** | California | **8.4** | 6.1 | 2.3 | 5.2 | 3.2 |
| **3** | Massachusetts | **7.3** | 5.2 | 2.2 | 2.9 | 4.4 |
| **4** | Rhode Island | **7.1** | 4.6 | 2.5 | 3.6 | 3.5 |
| **5** | Nevada | **6.7** | 3.7 | 2.9 | 3.6 | 3.0 |
| **6** | New Jersey | **6.6** | 4.4 | 2.3 | 3.4 | 3.3 |
| **7** | Maine | **6.6** | 3.3 | 3.3 | 1.3 | 5.3 |
| **8** | Oregon | **6.4** | 3.8 | 2.6 | 3.3 | 3.1 |
| **9** | Washington | **6.4** | 4.4 | 2.0 | 3.4 | 3.0 |
| **10** | Florida | **6.2** | 2.7 | 3.5 | 2.3 | 3.9 |
| **11** | New Hampshire | **6.2** | 3.8 | 2.4 | 2.8 | 3.4 |
| **12** | Montana | **6.2** | 2.5 | 3.7 | 1.9 | 4.3 |
| **13** | Maryland | **6.0** | 3.8 | 2.2 | 3.0 | 3.0 |
| **14** | Arizona | **6.0** | 3.2 | 2.8 | 2.8 | 3.2 |
| **15** | New York | **5.9** | 4.0 | 1.8 | 2.5 | 3.4 |
| **16** | Hawaii | **5.8** | 4.6 | 1.2 | 3.9 | 1.9 |
| **17** | Minnesota | **5.6** | 2.8 | 2.8 | 2.2 | 3.4 |
| **18** | Wyoming | **5.6** | 1.7 | 4.0 | 1.9 | 3.7 |
| **19** | Vermont | **5.5** | 2.5 | 3.0 | 1.0 | 4.5 |
| **20** | Connecticut | **5.4** | 3.9 | 1.5 | 3.1 | 2.3 |
| **21** | Colorado | **5.2** | 3.3 | 1.9 | 2.6 | 2.6 |
| **22** | Virginia | **5.1** | 3.3 | 1.8 | 2.2 | 2.9 |
| **23** | Delaware | **5.0** | 3.1 | 1.9 | 2.1 | 2.9 |
| **24** | Illinois | **4.9** | 2.4 | 2.5 | 1.3 | 3.6 |
| **25** | Michigan | **4.6** | 2.2 | 2.4 | 1.2 | 3.5 |
| **26** | Wisconsin | **4.4** | 2.1 | 2.2 | 1.6 | 2.8 |
| **27** | Pennsylvania | **4.2** | 2.1 | 2.0 | 1.2 | 3.0 |
| **28** | Utah | **4.0** | 2.6 | 1.4 | 2.1 | 2.0 |
| **29** | New Mexico | **3.8** | 2.2 | 1.6 | 2.2 | 1.6 |
| **30** | North Dakota | **3.8** | 0.6 | 3.2 | 0.9 | 2.9 |
| **31** | South Dakota | **3.6** | 0.8 | 2.8 | 0.4 | 3.2 |
| **32** | Idaho | **3.5** | 2.0 | 1.5 | 1.8 | 1.7 |
| **33** | Iowa | **3.4** | 0.6 | 2.8 | 0.7 | 2.7 |
| **34** | Kentucky | **3.3** | 1.3 | 2.0 | 0.6 | 2.7 |
| **35** | Alaska | **3.2** | 1.5 | 1.7 | 1.1 | 2.2 |
| **36** | Kansas | **3.1** | 0.6 | 2.5 | 1.1 | 2.0 |
| **37** | Louisiana | **3.1** | 1.1 | 1.9 | 1.6 | 1.5 |
| **38** | South Carolina | **3.0** | 1.7 | 1.3 | 1.2 | 1.8 |
| **39** | Georgia | **3.0** | 1.5 | 1.4 | 1.3 | 1.7 |
| **40** | Missouri | **2.8** | 1.5 | 1.4 | 1.0 | 1.8 |
| **41** | Ohio | **2.8** | 1.7 | 1.1 | 1.3 | 1.5 |
| **42** | Tennessee | **2.6** | 1.4 | 1.2 | 0.9 | 1.8 |
| **43** | Arkansas | **2.6** | 0.9 | 1.7 | 1.2 | 1.4 |
| **44** | West Virginia | **2.5** | 0.5 | 1.9 | 0.4 | 2.1 |
| **45** | Nebraska | **2.5** | 1.0 | 1.5 | 0.9 | 1.6 |
| **46** | Oklahoma | **2.5** | 0.0 | 2.5 | 0.5 | 2.0 |
| **47** | Alabama | **2.3** | 1.2 | 1.2 | 0.9 | 1.5 |
| **48** | North Carolina | **2.3** | 1.8 | 0.4 | 1.2 | 1.1 |
| **49** | Indiana | **2.2** | 1.3 | 0.9 | 1.0 | 1.1 |
| **50** | Mississippi | **1.0** | -0.1 | 1.1 | -0.2 | 1.2 |
| **51** | Texas | **0.9** | 0.3 | 0.6 | 1.1 | -0.2 |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices.

HSBC

# 8.4. Required real capital gains using ex-post risk HRP: cities

| Rank | Area | Required real price growth | 20yr average | Deviation from 20yr average (ppt) | 30yr average | Deviation from 30yr average (ppt) |
|---|---|---|---|---|---|---|
| 1 | Boston-Quincy, MA (MSAD) | 7.9 | 6.0 | 1.9 | 4.9 | 3.0 |
| 2 | Nassau-Suffolk, NY (MSAD) | 7.8 | 5.4 | 2.5 | 3.6 | 4.2 |
| 3 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 7.7 | 6.4 | 1.4 | 5.6 | 2.1 |
| 4 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 7.7 | 6.0 | 1.7 | 5.1 | 2.6 |
| 5 | Riverside-San Bernardino-Ontario, CA | 7.4 | 5.0 | 2.4 | 4.3 | 3.0 |
| 6 | Oakland-Fremont-Hayward, CA (MSAD) | 7.3 | 6.1 | 1.2 | 5.5 | 1.8 |
| 7 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 7.3 | 5.8 | 1.5 | 5.3 | 2.0 |
| 8 | San Diego-Carlsbad-San Marcos, CA | 7.1 | 5.7 | 1.4 | 5.0 | 2.0 |
| 9 | Sacramento-Arden-Arcade-Roseville, CA | 7.1 | 5.2 | 1.9 | 4.5 | 2.6 |
| 10 | Miami-Miami Beach-Kendall, FL (MSAD) | 7.1 | 4.2 | 2.9 | 3.5 | 3.6 |
| 11 | Seattle-Bellevue-Everett, WA (MSAD) | 6.9 | 5.2 | 1.8 | 3.9 | 3.0 |
| 12 | Providence-New Bedford-Fall River, RI-MA | 6.8 | 4.9 | 2.0 | 4.0 | 2.9 |
| 13 | Palm Bay-Melbourne-Titusville, FL | 6.8 | 3.0 | 3.8 | 3.2 | 3.7 |
| 14 | Edison, NJ (MSAD) | 6.7 | 4.8 | 2.0 | 4.0 | 2.8 |
| 15 | New York-Wayne-White Plains, NY-NJ (MSAD) | 6.6 | 5.5 | 1.1 | 4.3 | 2.2 |
| 16 | Newark-Union, NJ-PA (MSAD) | 6.4 | 4.9 | 1.4 | 4.2 | 2.2 |
| 17 | Phoenix-Mesa-Scottdale, AZ | 6.3 | 3.5 | 2.8 | 3.3 | 3.0 |
| 18 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 6.1 | 4.2 | 1.9 | 3.9 | 2.2 |
| 19 | Tampa-St. Petersburg-Clearwater, FL | 6.0 | 3.1 | 2.9 | 2.8 | 3.2 |
| 20 | Baltimore-Towson, MD | 6.0 | 3.6 | 2.3 | 2.8 | 3.2 |
| 21 | Portland-Vancouver-Beaverton, OR-WA | 6.0 | 3.7 | 2.2 | 3.2 | 2.8 |
| 22 | Honolulu, HI | 5.7 | 4.9 | 0.9 | 4.3 | 1.4 |
| 23 | Tucson, AZ | 5.7 | 3.4 | 2.3 | 3.1 | 2.6 |
| 24 | Orlando, FL | 5.6 | 3.2 | 2.4 | 3.2 | 2.4 |
| 25 | New Haven-Milford, CT | 5.5 | 3.8 | 1.7 | 3.4 | 2.1 |
| 26 | Minneapolis-St. Paul-Bloomington, MN-WI | 5.5 | 3.3 | 2.2 | 2.7 | 2.8 |
| 27 | Las Vegas-Paradise, NV | 5.5 | 3.2 | 2.3 | 3.3 | 2.1 |
| 28 | Philadelphia, PA (MSAD) | 5.4 | 3.2 | 2.2 | 2.4 | 3.0 |
| 29 | Virginia Beach-Norfolk-Newport News, VA-NC | 5.4 | 3.2 | 2.2 | 2.5 | 2.9 |
| 30 | Charleston-North Charleston, SC | 5.4 | 3.5 | 2.0 | 3.2 | 2.3 |
| 31 | Bridgeport-Stamford-Norwalk, CT | 5.4 | 4.5 | 0.9 | 4.0 | 1.4 |
| 32 | Denver-Aurora, CO | 5.2 | 3.5 | 1.7 | 2.8 | 2.5 |
| 33 | Chicago-Naperville-Joliet, IL (MSAD) | 5.1 | 3.2 | 2.0 | 2.1 | 3.0 |
| 34 | Detroit-Livonia-Dearborn, MI (MSAD) | 5.0 | 2.7 | 2.3 | 1.7 | 3.4 |
| 35 | Salt Lake City, UT | 4.3 | 2.5 | 1.8 | 1.9 | 2.4 |
| 36 | Hartford-West Hartford-East Hartford, CT | 4.1 | 3.1 | 0.9 | 2.8 | 1.3 |
| 37 | Milwaukee-Waukesha-West Allis, WI | 3.8 | 2.2 | 1.6 | 1.8 | 2.0 |
| 38 | Colorado Springs, CO | 3.3 | 2.3 | 1.0 | 2.4 | 1.0 |
| 39 | Cedar Rapids, IA | 3.3 | 2.0 | 1.3 | 2.0 | 1.3 |
| 40 | St. Louis, MO-IL | 3.3 | 2.2 | 1.1 | 1.6 | 1.7 |
| 41 | Nashville-Davidson-Murfreesboro, TN | 3.2 | 1.8 | 1.4 | 1.5 | 1.7 |
| 42 | Albuquerque, NM | 3.1 | 2.1 | 1.0 | 1.9 | 1.2 |
| 43 | Atlanta-Sandy Springs-Marietta, GA | 3.0 | 1.7 | 1.3 | 1.5 | 1.5 |
| 44 | New Orleans-Metairie-Kenner, LA | 2.8 | 1.5 | 1.3 | 1.8 | 1.1 |
| 45 | Kansas City, MO-KS | 2.8 | 1.7 | 1.1 | 1.5 | 1.3 |
| 46 | Columbus, OH | 2.8 | 1.9 | 0.9 | 1.5 | 1.2 |
| 47 | Cleveland-Elyria-Mentor, OH | 2.7 | 1.9 | 0.8 | 1.5 | 1.2 |
| 48 | Austin-Round Rock, TX | 2.6 | 2.1 | 0.5 | 2.1 | 0.5 |
| 49 | Cincinnati-Middletown, OH-KY-IN | 2.4 | 1.7 | 0.7 | 1.5 | 0.9 |
| 50 | Omaha-Council Bluffs, NE-IA | 2.4 | 1.4 | 1.0 | 1.4 | 1.0 |
| 51 | Pittsburgh, PA | 2.3 | 1.4 | 0.9 | 0.6 | 1.7 |
| 52 | Buffalo-Niagara Falls, NY | 2.0 | 1.4 | 0.6 | 0.2 | 1.8 |
| 53 | Indianapolis, IN | 2.0 | 1.6 | 0.4 | 1.4 | 0.6 |
| 54 | Charlotte-Gastonia-Concord, NC-SC | 1.8 | 2.0 | -0.2 | 1.4 | 0.4 |
| 55 | Greensboro-High Point, NC | 1.4 | 1.4 | 0.0 | 1.1 | 0.2 |
| 56 | Memphis, TN-MS-AR | 1.4 | 1.4 | 0.0 | 1.2 | 0.2 |
| 57 | Houston-Baytown-Sugar Land, TX | 1.3 | 0.6 | 0.8 | 1.1 | 0.2 |
| 58 | Dallas-Plano-Irving, TX (MSAD) | 1.0 | 1.3 | -0.3 | 1.8 | -0.7 |
| 59 | San Antonio, TX | 0.8 | 0.4 | 0.4 | 0.9 | -0.1 |

Source: HSBC

HSBC

# 8.5. Required real capital gains using vol-based HRP: states

| Rank | Area | Required real price growth | 20y average real price growth* | Deviation from 20yr average (ppt) | 30y average real price growth* | Deviation from 30yr average (ppt) |
|---|---|---|---|---|---|---|
| | United States (median house price) | | | | | |
| | United States (average)* | 3.8 | 3.1 | 0.7 | 2.5 | 1.2 |
| | | | | | | |
| | Total Bubble Zone | 6.2 | 4.2 | 2.0 | 3.7 | 2.5 |
| | Eastern Bubble Zone | 5.8 | 3.7 | 2.1 | 3.1 | 2.6 |
| | Western Bubble Zone | 8.2 | 4.8 | 3.4 | 4.4 | 3.7 |
| | Non-Bubble Zone | 1.2 | 1.7 | -0.5 | 1.2 | 0.0 |
| | | | | | | |
| **1** | Hawaii | 10.8 | 4.6 | 6.2 | 3.7 | 7.1 |
| **2** | California | 8.6 | 5.3 | 3.3 | 5.1 | 3.5 |
| **3** | Rhode Island | 7.9 | 5.0 | 2.9 | 3.8 | 4.0 |
| **4** | District of Columbia | 7.0 | 5.5 | 1.5 | 4.6 | 2.4 |
| **5** | Connecticut | 6.9 | 2.9 | 4.0 | 3.1 | 3.8 |
| **6** | Nevada | 6.8 | 3.4 | 3.4 | 2.9 | 3.9 |
| **7** | Massachusetts | 6.7 | 3.8 | 2.9 | 4.4 | 2.3 |
| **8** | New Jersey | 6.5 | 3.9 | 2.6 | 3.6 | 2.9 |
| **9** | Oregon | 6.1 | 4.2 | 1.9 | 2.9 | 3.2 |
| **10** | Washington | 5.8 | 3.9 | 1.9 | 3.5 | 2.3 |
| **11** | New Hampshire | 5.5 | 3.1 | 2.4 | 3.3 | 2.2 |
| **12** | Alaska | 5.4 | 0.3 | 5.0 | 0.8 | 4.6 |
| **13** | Maryland | 5.4 | 3.9 | 1.5 | 2.9 | 2.4 |
| **14** | New York | 5.2 | 3.4 | 1.7 | 3.3 | 1.9 |
| **15** | Arizona | 5.0 | 2.5 | 2.5 | 2.2 | 2.8 |
| **16** | Wyoming | 4.7 | 1.8 | 2.9 | 1.4 | 3.3 |
| **17** | Utah | 4.5 | 2.1 | 2.4 | 1.8 | 2.7 |
| **18** | Virginia | 4.5 | 3.3 | 1.1 | 2.3 | 2.1 |
| **19** | Montana | 4.3 | 2.5 | 1.8 | 2.0 | 2.3 |
| **20** | Florida | 4.2 | 3.2 | 1.1 | 2.0 | 2.2 |
| **21** | Colorado | 4.2 | 2.6 | 1.5 | 2.6 | 1.6 |
| **22** | Delaware | 4.1 | 3.3 | 0.8 | 2.2 | 1.9 |
| **23** | Maine | 3.5 | 3.3 | 0.1 | 3.0 | 0.5 |
| **24** | North Dakota | 3.2 | 0.9 | 2.3 | 0.6 | 2.6 |
| **25** | Vermont | 3.2 | 3.2 | -0.1 | 2.0 | 1.1 |
| **26** | Wisconsin | 2.6 | 2.7 | -0.2 | 1.5 | 1.0 |
| **27** | Idaho | 2.4 | 2.0 | 0.4 | 1.2 | 1.2 |
| **28** | Minnesota | 2.2 | 3.1 | -0.9 | 2.4 | -0.1 |
| **29** | New Mexico | 2.1 | 1.3 | 0.8 | 1.5 | 0.6 |
| **30** | Illinois | 2.1 | 3.0 | -0.9 | 1.8 | 0.3 |
| **31** | Michigan | 2.0 | 3.3 | -1.3 | 1.9 | 0.1 |
| **32** | Louisiana | 1.3 | 0.6 | 0.7 | 0.8 | 0.5 |
| **33** | Pennsylvania | 1.2 | 2.8 | -1.6 | 1.7 | -0.4 |
| **34** | West Virginia | 1.2 | 1.3 | -0.1 | 0.1 | 1.1 |
| **35** | Ohio | 0.5 | 2.0 | -1.4 | 1.1 | -0.5 |
| **36** | South Dakota | 0.4 | 1.8 | -1.4 | 0.9 | -0.5 |
| **37** | Kentucky | 0.1 | 1.8 | -1.7 | 0.9 | -0.8 |
| **38** | Missouri | 0.0 | 1.6 | -1.6 | 1.0 | -1.1 |
| **39** | Iowa | -0.1 | 1.7 | -1.8 | 0.8 | -0.9 |
| **40** | South Carolina | -0.2 | 1.7 | -1.8 | 1.1 | -1.2 |
| **41** | Georgia | -0.2 | 1.6 | -1.8 | 1.0 | -1.2 |
| **42** | Alabama | -0.3 | 1.3 | -1.5 | 0.6 | -0.8 |
| **43** | Tennessee | -0.4 | 1.4 | -1.8 | 0.9 | -1.3 |
| **44** | Kansas | -0.5 | 1.1 | -1.6 | 0.6 | -1.1 |
| **45** | North Carolina | -0.5 | 1.5 | -2.1 | 1.1 | -1.7 |
| **46** | Oklahoma | -0.6 | -0.2 | -0.4 | 0.4 | -0.9 |
| **47** | Arkansas | -0.9 | 0.8 | -1.6 | 0.7 | -1.5 |
| **48** | Indiana | -0.9 | 1.5 | -2.4 | 0.9 | -1.7 |
| **49** | Nebraska | -1.2 | 1.4 | -2.6 | 0.8 | -2.0 |
| **50** | Texas | -2.2 | -0.3 | -1.9 | 0.3 | -2.5 |
| **51** | Mississippi | -2.7 | 0.5 | -3.3 | 0.0 | -2.8 |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices. **Average actual real price growth.

HSBC

# 8.6 Required real capital gains using vol-based HRP: cities

| Rank | Area | Required real price growth | 20y average real price growth* | Deviation from 20yr average (ppt) | 30y avg real price growth* | Deviation from 30yr average (ppt) |
|---|---|---|---|---|---|---|
| 1 | Honolulu, HI | 11.2 | 4.4 | 6.8 | 4.0 | 7.2 |
| 2 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 10.3 | 5.2 | 5.0 | 5.0 | 5.3 |
| 3 | Riverside-San Bernardino-Ontario, CA | 10.0 | 4.4 | 5.6 | 4.1 | 5.9 |
| 4 | San Diego-Carlsbad-San Marcos, CA | 10.0 | 5.6 | 4.3 | 4.9 | 5.0 |
| 5 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 9.9 | 5.1 | 4.8 | 5.1 | 4.8 |
| 6 | Bridgeport-Stamford-Norwalk, CT | 9.7 | 3.3 | 6.4 | 3.8 | 5.9 |
| 7 | Oakland-Fremont-Hayward, CA (MSAD) | 9.3 | 5.5 | 3.8 | 5.3 | 4.1 |
| 8 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 9.3 | 5.8 | 3.4 | 5.5 | 3.7 |
| 9 | Sacramento-Arden-Arcade-Roseville, CA | 8.8 | 5.1 | 3.7 | 4.3 | 4.5 |
| 10 | Nassau-Suffolk, NY (MSAD) | 8.6 | 4.4 | 4.1 | 4.6 | 4.0 |
| 11 | Providence-New Bedford-Fall River, RI-MA | 8.5 | 4.8 | 3.7 | 4.0 | 4.5 |
| 12 | New York-Wayne-White Plains, NY-NJ (MSAD) | 8.4 | 4.2 | 4.2 | 4.6 | 3.7 |
| 13 | Newark-Union, NJ-PA (MSAD) | 8.3 | 3.8 | 4.5 | 4.1 | 4.2 |
| 14 | Las Vegas-Paradise, NV | 8.1 | 3.4 | 4.7 | 2.3 | 5.8 |
| 15 | New Haven-Milford, CT | 8.1 | 3.0 | 5.0 | 3.0 | 5.1 |
| 16 | Boston-Quincy, MA (MSAD) | 7.8 | 4.2 | 3.7 | 5.3 | 2.6 |
| 17 | Seattle-Bellevue-Everett, WA (MSAD) | 7.6 | 4.5 | 3.1 | 4.3 | 3.4 |
| 18 | Edison, NJ (MSAD) | 7.5 | 4.3 | 3.2 | 4.0 | 3.5 |
| 19 | Miami-Miami Beach-Kendall, FL (MSAD) | 7.1 | 4.3 | 2.8 | 3.2 | 3.9 |
| 20 | Palm Bay-Melbourne-Titusville, FL | 7.0 | 2.9 | 4.1 | 2.2 | 4.8 |
| 21 | Hartford-West Hartford-East Hartford, CT | 7.0 | 2.5 | 4.5 | 2.3 | 4.7 |
| 22 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 6.6 | 4.4 | 2.2 | 3.3 | 3.3 |
| 23 | Charleston-North Charleston, SC | 6.5 | 3.1 | 3.4 | 2.6 | 3.9 |
| 24 | Portland-Vancouver-Beaverton, OR-WA | 6.1 | 4.1 | 2.0 | 2.8 | 3.3 |
| 25 | Tucson, AZ | 6.0 | 2.6 | 3.4 | 2.4 | 3.6 |
| 26 | Phoenix-Mesa-Scottdale, AZ | 5.6 | 2.5 | 3.1 | 2.5 | 3.2 |
| 27 | Denver-Aurora, CO | 5.3 | 2.5 | 2.8 | 2.8 | 2.5 |
| 28 | Baltimore-Towson, MD | 4.8 | 3.8 | 1.0 | 2.8 | 2.0 |
| 29 | Salt Lake City, UT | 4.4 | 2.4 | 2.0 | 1.7 | 2.7 |
| 30 | Chicago-Naperville-Joliet, IL (MSAD) | 4.2 | 3.5 | 0.8 | 2.4 | 1.9 |
| 31 | Virginia Beach-Norfolk-Newport News, VA-NC | 4.1 | 2.6 | 1.5 | 2.3 | 1.8 |
| 32 | Milwaukee-Waukesha-West Allis, WI | 4.1 | 3.0 | 1.1 | 1.3 | 2.7 |
| 33 | Orlando, FL | 4.0 | 2.5 | 1.6 | 2.3 | 1.7 |
| 34 | Philadelphia, PA (MSAD) | 3.9 | 3.5 | 0.3 | 2.5 | 1.3 |
| 35 | Tampa-St. Petersburg-Clearwater, FL | 3.8 | 2.9 | 1.0 | 2.4 | 1.5 |
| 36 | Minneapolis-St. Paul-Bloomington, MN-WI | 3.6 | 3.2 | 0.4 | 2.5 | 1.1 |
| 37 | Detroit-Livonia-Dearborn, MI (MSAD) | 3.6 | 3.8 | -0.2 | 2.3 | 1.3 |
| 38 | Colorado Springs, CO | 3.5 | 1.9 | 1.6 | 1.5 | 2.0 |
| 39 | New Orleans-Metairie-Kenner, LA | 2.7 | 1.1 | 1.6 | 0.8 | 1.8 |
| 40 | Austin-Round Rock, TX | 2.6 | 0.3 | 2.3 | 1.4 | 1.2 |
| 41 | Kansas City, MO-KS | 2.3 | 1.5 | 0.8 | 0.9 | 1.3 |
| 42 | Albuquerque, NM | 2.2 | 1.2 | 1.1 | 1.2 | 1.0 |
| 43 | Houston-Baytown-Sugar Land, TX | 2.2 | 0.2 | 2.0 | -0.1 | 2.3 |
| 44 | Nashville-Davidson-Murfreesboro, TN | 2.0 | 1.7 | 0.4 | 1.0 | 1.0 |
| 45 | Cincinnati-Middletown, OH-KY-IN | 1.5 | 1.9 | -0.4 | 1.0 | 0.5 |
| 46 | San Antonio, TX | 1.5 | -0.4 | 1.9 | -0.3 | 1.8 |
| 47 | Cleveland-Elyria-Mentor, OH | 1.4 | 2.0 | -0.6 | 1.2 | 0.3 |
| 48 | Columbus, OH | 1.2 | 2.0 | -0.8 | 1.1 | 0.0 |
| 49 | Memphis, TN-MS-AR | 1.1 | 0.8 | 0.3 | 0.6 | 0.6 |
| 50 | St. Louis, MO-IL | 1.1 | 1.8 | -0.7 | 1.6 | -0.5 |
| 51 | Charlotte-Gastonia-Concord, NC-SC | 1.1 | 1.5 | -0.4 | 1.2 | -0.1 |
| 52 | Greensboro-High Point, NC | 0.9 | 1.0 | -0.1 | 0.6 | 0.3 |
| 53 | Cedar Rapids, IA | 0.5 | 1.7 | -1.2 | 1.4 | -0.9 |
| 54 | Omaha-Council Bluffs, NE-IA | 0.5 | 1.4 | -0.9 | 0.7 | -0.2 |
| 55 | Atlanta-Sandy Springs-Marietta, GA | 0.5 | 1.6 | -1.1 | 1.1 | -0.6 |
| 56 | Dallas-Plano-Irving, TX (MSAD) | 0.4 | -0.6 | 0.9 | 0.8 | -0.4 |
| 57 | Pittsburgh, PA | 0.1 | 1.9 | -1.7 | 0.9 | -0.8 |
| 58 | Indianapolis, IN | -0.4 | 1.4 | -1.8 | 1.0 | -1.3 |
| 59 | Buffalo-Niagara Falls, NY | -0.8 | 1.7 | -2.5 | 1.1 | -1.9 |

Source: HSBC. *Average actual real price growth.

HSBC

# 8.7 Required real capital gains using zero HRP: states

| Rank | Area | Required real price growth based on zero HRP | 20yr average | Deviation from 20yr average (ppt) | 30yr average | Deviation from 30yr average (ppt) |
|---|---|---|---|---|---|---|
| | United States (median) | -0.9 | -2.8 | 1.9 | -3.4 | 2.5 |
| | United States (average)* | 0.3 | -1.5 | 1.8 | -2.1 | 2.4 |
| | | | | | | |
| | Total Bubble Zone | 1.3 | -0.4 | 1.8 | -1.3 | 2.6 |
| | Eastern Bubble Zone | 0.8 | -1.0 | 1.8 | -2.0 | 2.8 |
| | Western Bubble Zone | 1.9 | 0.2 | 1.7 | -0.5 | 2.4 |
| | Non-Bubble Zone | -1.2 | -2.4 | 1.3 | -2.8 | 1.6 |
| | | | | | | |
| **1** | Hawaii | **1.9** | 0.7 | 1.2 | 0.0 | 1.9 |
| **2** | California | **1.4** | -0.9 | 2.3 | -1.8 | 3.2 |
| **3** | Maryland | **0.5** | -1.6 | 2.2 | -2.5 | 3.0 |
| **4** | Nevada | **0.5** | -2.5 | 2.9 | -2.6 | 3.0 |
| **5** | Oregon | **0.5** | -2.2 | 2.6 | -2.7 | 3.1 |
| **6** | Washington | **0.4** | -1.6 | 2.0 | -2.6 | 3.0 |
| **7** | Rhode Island | **0.3** | -2.2 | 2.5 | -3.2 | 3.5 |
| **8** | Virginia | **0.2** | -1.6 | 1.8 | -2.7 | 2.9 |
| **9** | District of Columbia | **0.1** | -3.6 | 3.7 | -4.0 | 4.1 |
| **10** | New Jersey | **0.0** | -2.2 | 2.3 | -3.2 | 3.3 |
| **11** | Connecticut | **-0.1** | -1.6 | 1.5 | -2.4 | 2.3 |
| **12** | Massachusetts | **-0.2** | -2.4 | 2.2 | -4.6 | 4.4 |
| **13** | Utah | **-0.3** | -1.7 | 1.4 | -2.2 | 2.0 |
| **14** | Delaware | **-0.3** | -2.2 | 1.9 | -3.2 | 2.9 |
| **15** | Arizona | **-0.4** | -3.2 | 2.8 | -3.6 | 3.2 |
| **16** | Colorado | **-0.5** | -2.4 | 1.9 | -3.1 | 2.6 |
| **17** | Montana | **-0.6** | -4.4 | 3.7 | -4.9 | 4.3 |
| **18** | Florida | **-0.7** | -4.2 | 3.5 | -4.6 | 3.9 |
| **19** | New York | **-0.8** | -2.6 | 1.8 | -4.1 | 3.4 |
| **20** | Wisconsin | **-1.3** | -3.5 | 2.2 | -4.1 | 2.8 |
| **21** | Idaho | **-1.3** | -2.8 | 1.5 | -3.0 | 1.7 |
| **22** | New Hampshire | **-1.3** | -3.7 | 2.4 | -4.8 | 3.4 |
| **23** | Alaska | **-1.3** | -3.0 | 1.7 | -3.5 | 2.2 |
| **24** | Wyoming | **-1.4** | -5.4 | 4.0 | -5.1 | 3.7 |
| **25** | Illinois | **-1.5** | -4.0 | 2.5 | -5.1 | 3.6 |
| **26** | New Mexico | **-1.6** | -3.2 | 1.6 | -3.2 | 1.6 |
| **27** | Minnesota | **-1.6** | -4.4 | 2.8 | -5.0 | 3.4 |
| **28** | Vermont | **-1.8** | -4.9 | 3.0 | -6.4 | 4.5 |
| **29** | Maine | **-1.9** | -5.2 | 3.3 | -7.2 | 5.3 |
| **30** | South Carolina | **-2.3** | -3.6 | 1.3 | -4.1 | 1.8 |
| **31** | Michigan | **-2.3** | -4.8 | 2.4 | -5.8 | 3.5 |
| **32** | Ohio | **-2.4** | -3.5 | 1.1 | -3.8 | 1.5 |
| **33** | North Carolina | **-2.5** | -2.9 | 0.4 | -3.5 | 1.1 |
| **34** | Pennsylvania | **-2.5** | -4.5 | 2.0 | -5.5 | 3.0 |
| **35** | Kentucky | **-2.6** | -4.5 | 2.0 | -5.3 | 2.7 |
| **36** | Georgia | **-2.6** | -4.1 | 1.4 | -4.3 | 1.7 |
| **37** | Alabama | **-2.6** | -3.8 | 1.2 | -4.1 | 1.5 |
| **38** | Tennessee | **-2.8** | -4.0 | 1.2 | -4.6 | 1.8 |
| **39** | West Virginia | **-3.0** | -4.9 | 1.9 | -5.1 | 2.1 |
| **40** | North Dakota | **-3.1** | -6.3 | 3.2 | -6.0 | 2.9 |
| **41** | Louisiana | **-3.2** | -5.1 | 1.9 | -4.6 | 1.5 |
| **42** | Missouri | **-3.3** | -4.7 | 1.4 | -5.1 | 1.8 |
| **43** | Kansas | **-3.6** | -6.0 | 2.5 | -5.6 | 2.0 |
| **44** | Indiana | **-3.7** | -4.5 | 0.9 | -4.8 | 1.1 |
| **45** | South Dakota | **-3.9** | -6.7 | 2.8 | -7.1 | 3.2 |
| **46** | Arkansas | **-4.0** | -5.6 | 1.7 | -5.4 | 1.4 |
| **47** | Nebraska | **-4.1** | -5.6 | 1.5 | -5.7 | 1.6 |
| **48** | Iowa | **-4.1** | -6.9 | 2.8 | -6.8 | 2.7 |
| **49** | Oklahoma | **-5.0** | -7.5 | 2.5 | -7.0 | 2.0 |
| **50** | Mississippi | **-5.8** | -6.9 | 1.1 | -7.0 | 1.2 |
| **51** | Texas | **-5.9** | -6.5 | 0.6 | -5.7 | -0.2 |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices.

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# 8.8 Required real capital gains using zero HRP: cities

| Rank | Area | Required real price growth | 20yr average | Deviation from 20yr average (ppt) | 30yr average | Deviation from 30yr average (ppt) |
|---|---|---|---|---|---|---|
| 1 | Oakland-Fremont-Hayward, CA (MSAD) | 2.5 | 1.2 | 1.2 | 0.6 | 1.8 |
| 2 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 2.4 | 0.9 | 1.5 | 0.4 | 2.0 |
| 3 | San Diego-Carlsbad-San Marcos, CA | 2.3 | 0.9 | 1.4 | 0.3 | 2.0 |
| 4 | Bridgeport-Stamford-Norwalk, CT | 2.1 | 1.3 | 0.9 | 0.7 | 1.4 |
| 5 | Honolulu, HI | 2.0 | 1.1 | 0.9 | 0.6 | 1.4 |
| 6 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 1.9 | 0.6 | 1.4 | -0.2 | 2.1 |
| 7 | Riverside-San Bernardino-Ontario, CA | 1.9 | -0.5 | 2.4 | -1.2 | 3.0 |
| 8 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 1.8 | 0.2 | 1.7 | -0.8 | 2.6 |
| 9 | New York-Wayne-White Plains, NY-NJ (MSAD) | 1.7 | 0.6 | 1.1 | -0.6 | 2.2 |
| 10 | Newark-Union, NJ-PA (MSAD) | 1.7 | 0.2 | 1.4 | -0.5 | 2.2 |
| 11 | Sacramento-Arden-Arcade-Roseville, CA | 1.5 | -0.4 | 1.9 | -1.1 | 2.6 |
| 12 | Miami-Miami Beach-Kendall, FL (MSAD) | 1.3 | -1.6 | 2.9 | -2.3 | 3.6 |
| 13 | Seattle-Bellevue-Everett, WA (MSAD) | 1.2 | -0.5 | 1.8 | -1.7 | 3.0 |
| 14 | Nassau-Suffolk, NY (MSAD) | 1.1 | -1.3 | 2.5 | -3.1 | 4.2 |
| 15 | Las Vegas-Paradise, NV | 1.1 | -1.2 | 2.3 | -1.0 | 2.1 |
| 16 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 1.0 | -0.9 | 1.9 | -1.2 | 2.2 |
| 17 | Providence-New Bedford-Fall River, RI-MA | 1.0 | -1.0 | 2.0 | -1.9 | 2.9 |
| 18 | Portland-Vancouver-Beaverton, OR-WA | 0.6 | -1.6 | 2.2 | -2.2 | 2.8 |
| 19 | Boston-Quincy, MA (MSAD) | 0.6 | -1.3 | 1.9 | -2.4 | 3.0 |
| 20 | Charleston-North Charleston, SC | 0.5 | -1.4 | 2.0 | -1.7 | 2.3 |
| 21 | Tucson, AZ | 0.4 | -1.9 | 2.3 | -2.2 | 2.6 |
| 22 | Milwaukee-Waukesha-West Allis, WI | 0.3 | -1.3 | 1.6 | -1.7 | 2.0 |
| 23 | Edison, NJ (MSAD) | 0.3 | -1.7 | 2.0 | -2.5 | 2.8 |
| 24 | New Haven-Milford, CT | 0.3 | -1.4 | 1.7 | -1.8 | 2.1 |
| 25 | Chicago-Naperville-Joliet, IL (MSAD) | 0.3 | -1.7 | 2.0 | -2.8 | 3.0 |
| 26 | Baltimore-Towson, MD | 0.1 | -2.2 | 2.3 | -3.0 | 3.2 |
| 27 | Denver-Aurora, CO | 0.1 | -1.6 | 1.7 | -2.4 | 2.5 |
| 28 | Palm Bay-Melbourne-Titusville, FL | 0.1 | -3.7 | 3.8 | -3.6 | 3.7 |
| 29 | Hartford-West Hartford-East Hartford, CT | 0.0 | -0.9 | 0.9 | -1.3 | 1.3 |
| 30 | Phoenix-Mesa-Scottdale, AZ | -0.2 | -3.1 | 2.8 | -3.3 | 3.0 |
| 31 | Colorado Springs, CO | -0.4 | -1.4 | 1.0 | -1.3 | 1.0 |
| 32 | Minneapolis-St. Paul-Bloomington, MN-WI | -0.5 | -2.7 | 2.2 | -3.2 | 2.8 |
| 33 | Salt Lake City, UT | -0.5 | -2.3 | 1.8 | -2.9 | 2.4 |
| 34 | Virginia Beach-Norfolk-Newport News, VA-NC | -0.5 | -2.8 | 2.2 | -3.5 | 2.9 |
| 35 | Orlando, FL | -0.8 | -3.2 | 2.4 | -3.2 | 2.4 |
| 36 | Tampa-St. Petersburg-Clearwater, FL | -0.9 | -3.7 | 2.9 | -4.0 | 3.2 |
| 37 | Albuquerque, NM | -1.0 | -2.0 | 1.0 | -2.2 | 1.2 |
| 38 | Philadelphia, PA (MSAD) | -1.0 | -3.2 | 2.2 | -4.1 | 3.0 |
| 39 | Kansas City, MO-KS | -1.1 | -2.2 | 1.1 | -2.4 | 1.3 |
| 40 | Charlotte-Gastonia-Concord, NC-SC | -1.1 | -0.9 | -0.2 | -1.5 | 0.4 |
| 41 | Nashville-Davidson-Murfreesboro, TN | -1.1 | -2.5 | 1.4 | -2.8 | 1.7 |
| 42 | Columbus, OH | -1.2 | -2.1 | 0.9 | -2.5 | 1.2 |
| 43 | Greensboro-High Point, NC | -1.4 | -1.4 | 0.0 | -1.6 | 0.2 |
| 44 | Cincinnati-Middletown, OH-KY-IN | -1.4 | -2.0 | 0.7 | -2.3 | 0.9 |
| 45 | Cedar Rapids, IA | -1.4 | -2.7 | 1.3 | -2.8 | 1.3 |
| 46 | Memphis, TN-MS-AR | -1.6 | -1.6 | 0.0 | -1.8 | 0.2 |
| 47 | Detroit-Livonia-Dearborn, MI (MSAD) | -1.8 | -4.1 | 2.3 | -5.2 | 3.4 |
| 48 | New Orleans-Metairie-Kenner, LA | -1.8 | -3.1 | 1.3 | -2.9 | 1.1 |
| 49 | Cleveland-Elyria-Mentor, OH | -2.0 | -2.8 | 0.8 | -3.1 | 1.2 |
| 50 | Omaha-Council Bluffs, NE-IA | -2.0 | -3.0 | 1.0 | -3.0 | 1.0 |
| 51 | Atlanta-Sandy Springs-Marietta, GA | -2.1 | -3.4 | 1.3 | -3.6 | 1.5 |
| 52 | Houston-Baytown-Sugar Land, TX | -2.3 | -3.0 | 0.8 | -2.5 | 0.2 |
| 53 | St. Louis, MO-IL | -2.6 | -3.7 | 1.1 | -4.3 | 1.7 |
| 54 | San Antonio, TX | -2.8 | -3.1 | 0.4 | -2.6 | -0.1 |
| 55 | Indianapolis, IN | -2.9 | -3.3 | 0.4 | -3.5 | 0.6 |
| 56 | Austin-Round Rock, TX | -3.1 | -3.6 | 0.5 | -3.6 | 0.5 |
| 57 | Pittsburgh, PA | -3.2 | -4.0 | 0.9 | -4.8 | 1.7 |
| 58 | Dallas-Plano-Irving, TX (MSAD) | -3.8 | -3.5 | -0.3 | -3.0 | -0.7 |
| 59 | Buffalo-Niagara Falls, NY | -4.5 | -5.1 | 0.6 | -6.3 | 1.8 |

Source: HSBC

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# 9. Triggers and tipping points

- Higher mortgage rates, tighter standards on exotic mortgages…
- …or a shift down in expectations of future home price gains…
- …are the possible triggers to hose down the froth

## Three potential triggers

We think we have seen some evidence suggesting that nearly half the country in terms of housing units could be frothy, and that proportion goes to over half when considered in terms of the value of housing. If so, it implies an unsustainable trend that will at some point reverse. If so, some sort of trigger may be pulled to bring forth the inevitable turning point. What could those triggers be?

We suggest three:

- The most obvious is a sufficiently large increase in mortgage rates. Even if 10-year Treasury note yields remain low, an inverted yield curve, if sufficiently significant and persistent, could cause the spread between long-term government and mortgage interest rates to widen, as banks' cost of funding rises with the Fed funds rate. The incentive to lend will be reduced. Even so, given the current overcapacity and competition in the mortgage industry, firms may go ahead and make uneconomic decisions for a while yet.
- A second possibility is a tightening of mortgage standards that acts to constrain the supply of mortgages, thereby depriving the bubble of the air it needs to keep inflating. The most obvious of these are the so-called 'exotic' or non-traditional mortgage products that have boomed in popularity in recent years, such as option-ARMS, interest-only loans, miss-a-payment loans, 40-year loans and negative amortization loans. The entire "A-Team" of banking regulators (FRB, FDIC, OCC, OTS and NCUA), has flexed its muscles and proposed new guidance, which it will introduce (and enforce) sometime before mid-2006. This could be a key macro development.
- The third potential trigger is a decline in expectations of future house price gains, as expected price gains are a crucial determinant of the present value of a house. "Jaw-boning" by Fed officials has intensified in recent months with the intention, we think, to act as a warning and to cool people's overheated expectations where they exist. Greenspan went as far as to warn of 'speculative fervour' in some local real estate markets in his July 2005 Testimony, while his oft-repeated "housing froth" phrase has practically become a global trademark. The word "froth", by the way, is defined as "an aggregation of bubbles" according to the Oxford Economic

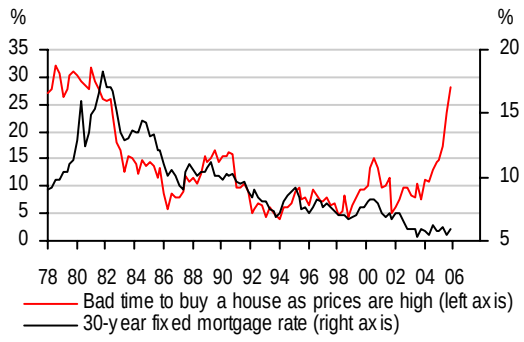
Dictionary. Given how careful Greenspan is with words, we think it is likely he looked it up before letting the word out.

## It's about psychology

All or any combination of these three triggers could be the proximate cause or causes of the puncturing mechanism. Although we do not rule it out entirely, our own sense is that rising mortgage rates will not play such a major role. Instead, a shift down in house price expectations, itself partially caused by the imminent tightening of standards on exotic mortgages, will probably end up being the key driver of the downturn.

This means that homebuyer and home seller psychology will be playing a large part in future price developments. Supporting this idea, the University of Michigan consumer sentiment report shows that the proportion of consumers who say that it is a bad time to buy a house 'because prices are high' is at its highest since the late 1970s and early 1980s, despite mortgage rates being about 10 percentage points lower today.

**9A. Bad time to buy?**

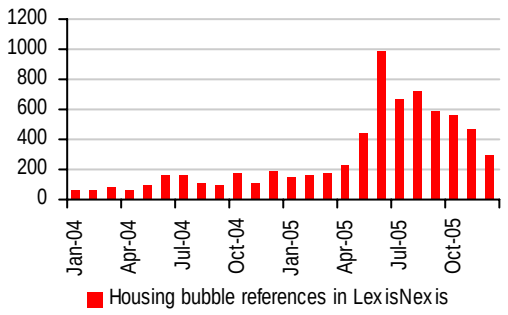



Source: University of Michigan, Datastream

Rather than simply waiting for a spike in mortgage rates to signal the puncturing of the bubble, then, tracking housing price psychology may prove to be just as important.

In that vein, counting how many times the words "housing bubble" is referenced in US newspapers and magazines is useful for tracking some of that psychology. Chart 9B was taken from our search for the terms "US housing bubble" in the press from the LexisNexis database. It clearly looks like what a bubble should look like, with an exponential increase that peaked in June 2005, then "bursting" by around 70% from the peak over the following months.

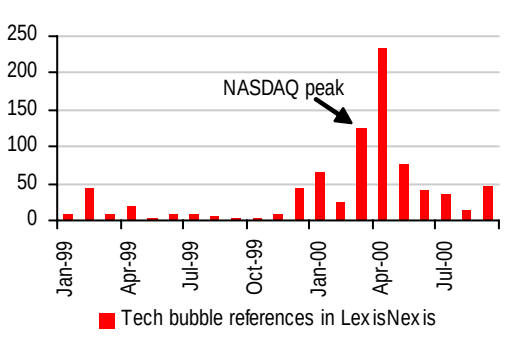
**9B. "Housing bubble" references peaked in June 2005**




Source: LexisNexis, HSBC

The same basic pattern emerged in press references to the "technology bubble" in the lead up to the peak of the NASDAQ stock market in 2000, which was then of course followed by the NASDAQ's collapse.

**9C. "Tech bubble" references leading up to the NASDAQ peak**




Source: LexisNexis, HSBC

Given this, one might infer that housing 'exuberance' may have already passed its psychological peak. By this time next year, it may be clear that the second half of 2005 was indeed the point when the housing bubble began to leak.

We don't know this in 'real time' because unlike the stock market, the data are not instant and are open to significant revision. The best data are only available quarterly and are only out with a two-month lag (OFHEO and NAR, for instance). Moreover, once housing bubbles puncture, they don't collapse like stocks can. Instead, they deflate slowly over a long period of time. In the early 1990s (early 1980s for Miami), the following table shows that "busts" in these city home prices lasted for a typical length of seven years.

**9D. Metropolitan area real house price declines (using core CPI)**

| | Cumulative decline | Peak to trough |
|---|---|---|
| US | -11% | Q3 89 - Q1 95 |
| US | -13% | Q2 79 – Q4 83 |
| Boston | -32% | Q2 88 - Q1 95 |
| Los Angeles | -38% | Q4 89 - Q2 97 |
| Miami | -25% | Q4 80 - Q4 86 |
| New York | -30% | Q2 88 - Q1 95 |
| San Diego | -28% | Q4 89 - Q2 96 |
| San Francisco | -28% | Q4 89 - Q2 96 |

Source: HSBC, Office of Federal Housing Enterprise Oversight, Bureau of Labor Statistics

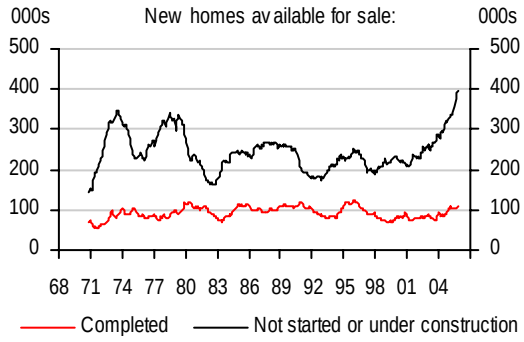
## Early and tentative

There is not much hard evidence of this yet in the price data, mind you, so our 'topping out' thesis is only an early and tentative suggestion. However, the Fed's Beige Book and Federal Reserve officials are all citing anecdotal evidence of some notable cooling beginning to take hold.

Homebuilder stocks have started to roll over, despite the stimulus that will occur from Gulf coast rebuilding, suggesting other areas' weakness will offset this strength. Longer sale times are generally being reported and the rising number of houses for sale has certainly climbed.

Prudential Douglas Elliman, a Manhattan real estate broker, reported that the average price per square foot in Manhattan stopped rising in Q3, while the average sale price dropped 13% due to a lack of luxury activity, the biggest quarterly drop in the broker's time series since 1989, which was then the start of a six-year slide.

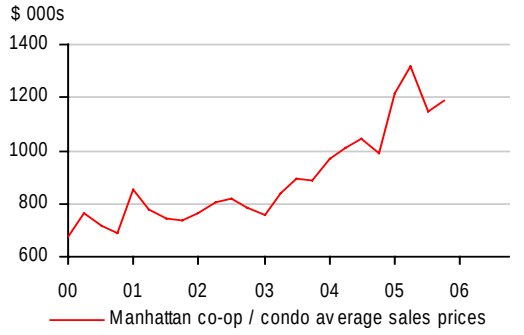
**9E. Inventory of uncompleted homes for sale has risen**




Source: Census Bureau, Datastream

There was a partial improvement in Q4, but if prices are flat in Q1 and Q2, the Q2/Q2 yearly rate will be -10%, and this is the number the media tend to focus on.

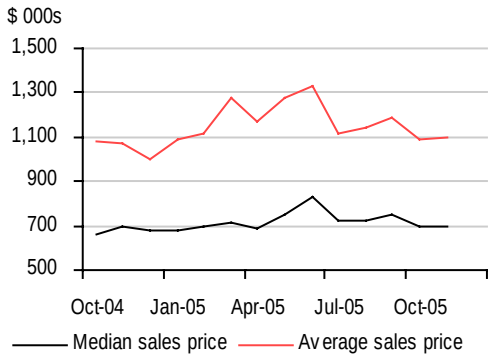
**9F. Average Manhattan sales price down from peak in Q2**




Source: Miller Samuel, Prudential Douglas Elliman

This 'topping out' signal is confirmed by another Manhattan real estate broker's time series, Halstead Property, which is showing average and median Manhattan apartment prices declining in July through November, after peaking in June. To be sure, this is just one city, but we might start soon hearing similar stories elsewhere.

**9G. Manhattan sales price peaked in June**




Source: Halstead Property

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# 10. The impact on home turnover

- Even a ‘soft landing’ in the form of flat nationwide house prices…
- …would be associated with imploding home sales
- A very tight link between a modified real mortgage rate and home turnover allows for some useful scenario analysis

## Watch the turn

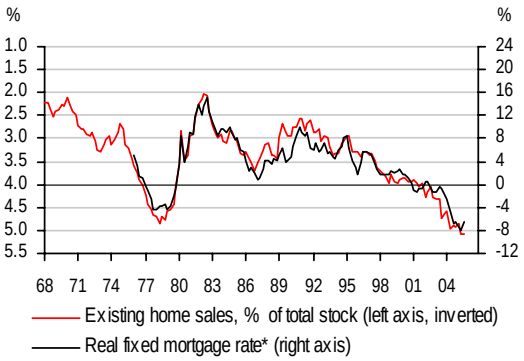
During his July 2005 Testimony, Greenspan in Q&A reassuringly noted that after a long house price boom, nationwide average nominal house prices tend to flatten out rather than experience outright price declines. What he did not say is that when house prices flatten out, existing home sales tend to collapse at the same time, often sending the economy into recession.

The last time national home prices ‘merely’ flattened was in the early 1990s (in real terms nationwide prices fell 11% over five years). That period was linked with bursting bubbles in the Northeast and Pacific real estate markets, and was associated with the savings and loans crisis, which required a fiscal bailout.

We have very strong evidence that flat nationwide home prices, should it occur, will cause a collapse in home sales again this time around.

Chart 10A shows the very strong correlation between existing home turnover (existing single-family home sales as a proportion of the stock of single family houses) and our modified measure of the real mortgage rate, defined as the nominal 30-year fixed mortgage rate less annual house price inflation.

**10A. A close link between housing turnover and our measure of real mortgage rates**




Source: HSBC

* Nominal 30-year fixed mortgage rate less y-o-y change in OFHEO house price index

What explains this tight link? Cause and effect is difficult to disentangle. But, as a first approximation, a drop in mortgage rates (which pushes down our measure of the real mortgage rate too) pushes up the demand for housing, which is then reflected in a rise in home turnover.

Given that the supply of homes only meets rising demand with a lag given long lead times in construction, this in turn pushes up house price inflation (which reduces our real mortgage rate

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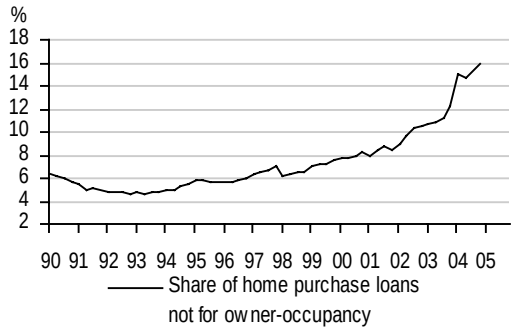
further). Sometimes, feedback loops can emerge, where the observation of higher prices results in higher demand for housing for speculative purposes, pushing home turnover higher in the process (thereby boosting house prices again and so reducing the modified real mortgage rate again…and so on).

And the evidence suggests that some speculation may have played a part in this virtuous cycle in recent years, with the purchase of existing homes not for owner-occupancy at a record high 16%, according to Greenspan's research, compared with 6% in the early 1990s.

**10B. Purchases that are not owner-occupied homes have soared**




Source: Federal Reserve

The relationship between our real mortgage rate and home turnover has held through an assortment of different growth, inflation and interest rate environments, including the high inflation 1970s, high real mortgage rates in the 1980s, the low inflation 1990s, the deflation scare of 2002-2003 and the conundrum of 2004-2005. It has been a robust relationship through time and through different environments.

If this relationship continues to hold (and we can see no reason why it should suddenly not), a seemingly benign flattening of home prices would be consistent with a severe plunge in home turnover.

Currently, our measure of the real mortgage rate is -6%, comprised of a (roughly) 6% mortgage rate and 12% annual home price appreciation (6 minus 12).

Say mortgage rates stay at 6%, but house prices flatten out to zero growth. The real mortgage rate would rise 12 percentage points to +6% (6 minus 0). As chart 10A highlights (left-hand axis), that would be consistent with a dive in home turnover from 5% to 3¼%, a decline of 35%.

Matrix 10C shows the impact on existing home sales from various combinations of nominal mortgage rates and house price inflation, based on the relationship on chart 10A.

**10C. Percentage change in single-family existing home sales**

| | Nominal 30-year fixed mortgage rate (%) | | | | |
|---|---|---|---|---|---|
| | 4 | 5 | 6 | 7 | 8 |
| **House prices (% yr)** | | | | | |
| -6 | -46 | -48 | -51 | -53 | -56 |
| -4 | -41 | -44 | -46 | -48 | -51 |
| -2 | -36 | -39 | -41 | -44 | -46 |
| 0 | -31 | -34 | -36 | -39 | -41 |
| 2 | -26 | -29 | -31 | -34 | -36 |
| 4 | -21 | -24 | -26 | -29 | -31 |
| 6 | -16 | -19 | -21 | -24 | -26 |
| 8 | -12 | -14 | -16 | -19 | -21 |
| 10 | -7 | -9 | -12 | -14 | -16 |
| 12 | -2 | -4 | -7 | -9 | -12 |

Source: HSBC

A bear on bonds might suggest that mortgage rates will rise to 7% (consistent with a 5.5% 10-year Treasury note yield) while house prices cool to a more reasonable 4%. This seems like a fair and uncontroversial opinion. But if our analysis is right, it would still be consistent with a 29% decline in existing home sales, from 7m a year to about 4.9m. That's quite a move.

Zero growth in house prices and a 7% mortgage rate, for instance, would be consistent with a 39% decline in existing home sales from 7m to about 4.2m.

Many observers argue that a housing bust is unlikely unless mortgage rates rise significantly.

However, matrix 10C shows that if house prices soften by enough, there are plenty of scenarios where 30-year mortgage rates drop to 5% or lower and existing home sales drop a lot anyway.

## The upside risk

In contrast, if existing home sales were to remain at 7m through 2006, then our analysis implies that annual national house price growth would remain incredibly strong at roughly 14-15%, based on unchanged mortgage rates. This would be consistent with 20% house price growth on the West and East coasts given their role as high beta markets, and perhaps around 10% in the country's middle.

In other words, it would be wholly inconsistent to expect existing home sales to remain flat at about a 7m annualized rate and at the same time expect to see house prices cool. And even a decline to 6m sales would still be consistent with around 10% price appreciation, if mortgage rates remain steady.

This suggests that one way or another, we are going to see fireworks. One of two things are likely (or both in sequential order): (1) existing home sales stay at current high levels, further feeding the bubble, and/or (2) house prices cool, triggering a collapse in home sales. Our own view, based on the earlier valuation work and the tentative evidence of prices 'topping out', is that the latter is, on balance, more likely (perhaps sometime in 2006). Once sales start trending down, it will be a steep decline.

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# 11. Houses as a liquid asset

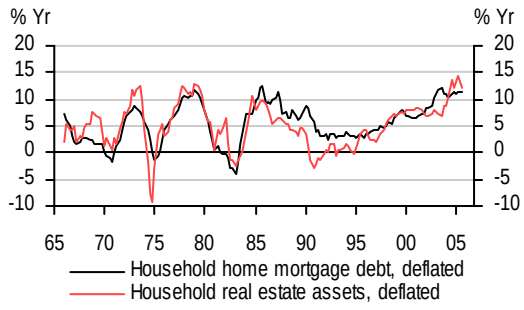
- There are three ways to extract home equity wealth…
- …and two of them have spluttered
- The inevitable downturn in MEW will hurt consumption

## Facing the MEWsic

Assume that house prices will be cooling by enough in the next few quarters so that sometime down the track existing home sales will be down substantially, as suggested in section 10.

Would this stop the gush of liquidity from mortgage equity withdrawal (MEW) that has augmented household purchasing power in the past few years? And if it does, would it impact spending, both in consumption (70% of GDP) and residential investment (6% of GDP)?

**11A. Inflation-adjusted home mortgage debt and real estate wealth**




Source: HSBC, Federal Reserve, Bureau of Labor Statistics

To begin to understand the impact, note that flattish home prices mean a significant slowing in mortgage debt growth (chart 11A). Meanwhile, some of that growth is in the form of MEW, which are funds secured on real estate that can be spent on things other than the expansion of the stock of residential homes. So flattish home prices may mean a downturn in MEW too that hurts consumer spending. But by how much? To gauge such possible downside risks, an understanding of how MEW works is useful. MEW occurs in three ways:

- **Cash-outs from mortgage refinancing** (where the volume of refinancing is already 85% lower than the mid-2003 peak according to the Mortgage Bankers Association.)
- **Home equity loans,** which have now stopped growing after up to 50% annualized growth in 2004. This flattening of loans was due to both rising Fed funds (home equity lines of credit tend to get charged the prime rate, which is 300bp over Fed funds), while banking and financial regulators released stricter guidance to lenders on such loans.
- **Home equity wealth liquefied after a home sale transaction,** where the buyer takes out a mortgage to buy the house, and part of the proceeds the seller receives becomes capital gains which can be spent. This is often still sizable even after the seller's outstanding debt has been cancelled, and this part of MEW is still

strong given high existing home sales and rapidly rising home prices.

Unfortunately, there is not one agreed approach to measuring MEW, and we note that different economists have different measures. We'll cover three here, from the smallest to the largest estimate; ultimately, they come to the same conclusion for growth.

**MEW method 1**

One simple methodology to measure MEW is the change in mortgage debt outstanding (as reported in *Flow of Funds*) less gross residential investment (as reported in GDP).

$$\Delta MD - GRI = MEW$$

$$955 \; - \; 733 \; = \; 222 \qquad (Yr \text{ to } 2005Q3, \$bn)$$

On this definition, MEW has been running at about USD200bn annualized in recent years, which is currently 1.7% of GDP.

**MEW method 2**

The drawback with method 1 is that home improvement expenditures and real estate broker commissions are already counted as part of gross residential investment (these two components have risen from USD163bn in 2000 to USD243bn in 2004). This understates the true size of MEW. If we adjust for this, then MEW has been higher at USD350-500bn per annum in the past five years, or 2.9-4.2% of GDP.

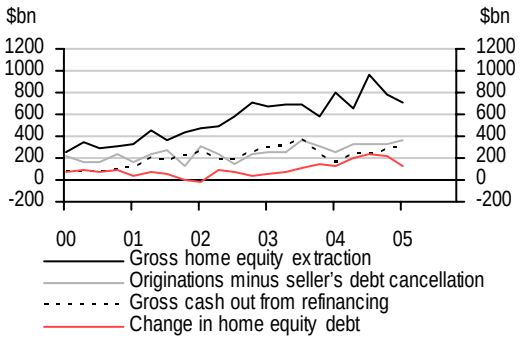
$$\Delta MD - adj.\ GRI = MEW$$

$$955 \; - \; 490 \; = \; 465 \qquad (Yr \text{ to } 2005Q3, \$bn)$$

**MEW method 3 – Greenspan's HEE**

Greenspan's estimate of what he calls home equity extraction (HEE), which is essentially the same concept as MEW, is even larger at USD733bn in 2004 (no estimate for 2005), and his HEE time series can apparently explain the entire drop in the personal saving ratio between 1995 and 2004.

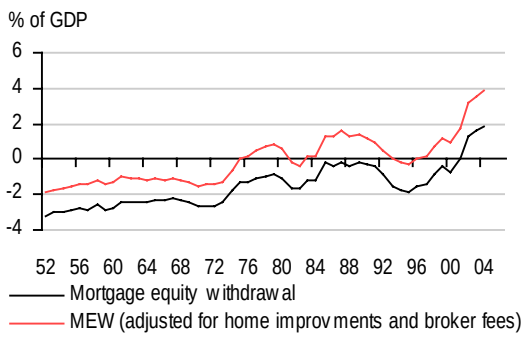
**11C. Breaking down home equity extraction**




Source: Federal Reserve, estimates by Alan Greenspan and James Kennedy

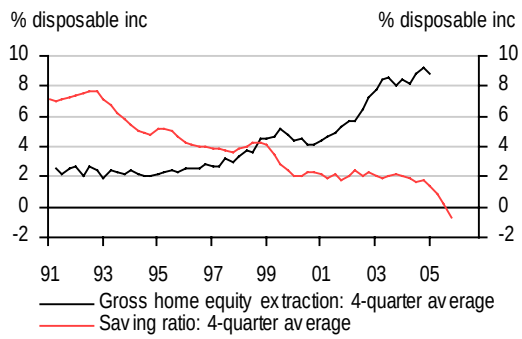
We have not yet been able to reconcile his estimate with ours, but in a nutshell his admittedly more complex and rigorous approach calculates HEE as the difference between *gross* mortgage debt origination less the value of existing homes purchased (whereas our MEW uses a *net* concept, i.e. gross mortgage debt origination less gross mortgage repayments less gross residential investment).

**11B. Mortgage equity withdrawal (MEW) estimates**




Source: HSBC, Bureau of Economic Analysis, Federal Reserve

**11D. Home equity extraction and the saving ratio**




Source: Federal Reserve

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### MEW impact on GDP

Whatever MEW estimate we use, it is clearly a very large number. Of course, not all of this is a stimulus for GDP. Some of it gets used to pay down more expensive debt (although MEW plus consumer credit in total has kept growing so in aggregate this has not happened) or used to purchase financial assets (although one person's stock purchase is another person's cash receipt which can then be used for spending, so again the aggregate effect is uncertain).

Fed surveys have suggested that about half of MEW feeds into GDP, suggesting that the economy might have received a direct boost to GDP somewhere between USD100-350bn per year over the last few years, depending on which method of MEW one uses.

### Forecasting future MEW

Given our earlier equation, we can forecast MEW (method 1) if we have forecasts for the change in mortgage debt and gross residential investment:

$$MEW = \Delta MD - GRI$$

So how do we go about (roughly) forecasting the change in mortgage debt outstanding and gross residential investment, on the assumption that house prices flatten? Based on chart 11E, flat house prices (and an associated 30-40% drop in home turnover) would be consistent with a slowdown in nominal mortgage debt growth, from 12% now towards, let's say, 5% (we think it could be lower but let's be conservative), which translates to an increase of USD410bn.

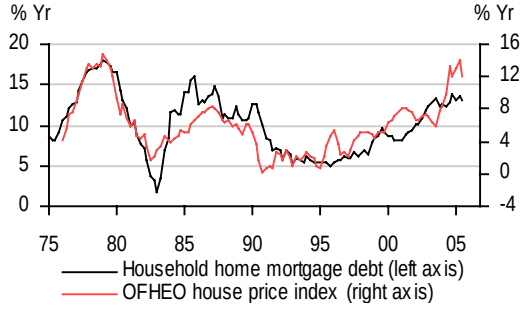
Chart 11F, meanwhile, suggests flattish home prices will result in the residential investment share of GDP dropping 1½ percentage points from 6% towards 4½%, translating into a 25% plunge from USD768bn in 2005Q3 to USD576bn (including spending on home improvements and broker commissions).

As a result, MEW (method 1) implodes from USD222bn currently to *negative USD166bn* (i.e. net MEW becomes net mortgage equity injection, MEI). This translates into a USD388bn drag that equates to 3.2% of GDP.

We suggest MEW (method 2), would drop from USD 465bn currently to about USD50-100bn, based on the relationship between MEW method 1 and 2 (chart 11B).

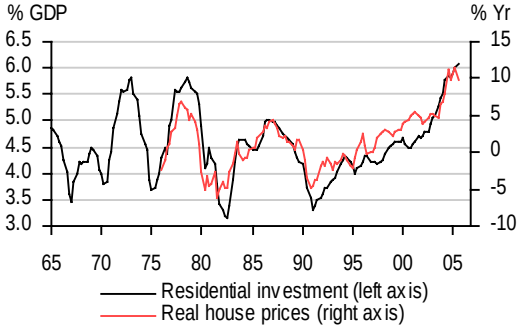
Presumably Greenspan's gross HEE estimate could halve from 9% of disposable income to 4½%, which according to chart 11D, would be consistent with a rise in the saving ratio of 2-4 percentage points. The upper end of that range would presumably cause a consumer recession if the adjustment occurred within a relatively short timeframe.

**11E. House prices and mortgage debt trends go together**




Source: Federal Reserve

**11F. If house prices flatten, residential investment could plunge**




Source: Bureau of Economic Analysis, Federal Reserve

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# 12. Life after froth

- Soft or hard landing?
- Policy could be extreme if it looks like a hard landing and the money supply started to decline too
- Bernanke believes that it was mainly money supply that affected output, rather than the other way around, during the 1930s

## It's late in the cycle

Our "froth-finding mission" across the US is reaching its end. We've come a long way, and what have we learned?

We've used a broad and varied range of valuation guides that suggest the US is indeed seeing quite a lot of froth in the housing market, mostly on the coasts but spreading inland a bit. Our research suggests that the areas infected by the housing market's version of irrational exuberance are big – bigger than 50% of the housing market in value terms. This area accounts for 50% of US GDP, or over USD 6 trillion. That is nearly the size of the German, French and UK economies put together.

The tables on the following two pages are a summary "froth-finder scoreboard" that averages most of our valuation measures into six key categories, those being: (1) price momentum, (2) price valuations, (3) rental yields, (4) homeowner costs, (5) risk premiums, and (6) required capital gains.

We ranked each state and city against each other on each of these key measures, and came up with an average rating for every state and city. The lower the score, the higher the likelihood of a bubble, and the larger the score, the less likelihood there is of a bubble. Those towards the top of the tables are the most likely bubbles, and those towards the bottom are the most attractively priced markets.

If the housing bubble is punctured, housing values don't tend to burst like stocks. Instead, they tend to gradually deflate in real terms (in national terms) or nominal terms (for local areas) over a long time period.

The 35-40% overvaluation of the bubble zone implies a 26-29% real price correction is required (a rise from 100 to 140 and back down to 100 is a rise of 40% and then a decline of 29%). That can happen over five to seven years, and some of the real price decline can occur through inflation over the medium term (say a 10% rise in inflation over five years coupled with a 16-19% decline in nominal prices). Even if nominal prices don't fall on a nationwide average basis, the impact on home turnover and mortgage equity withdrawal will be big enough to slow the economy materially.

Of course, there is no guarantee that valuations don't undershoot on the downside the way they did in the early 1990s in the aftermath of the savings and loans crisis. An unexpected sharp

tightening of standards on non-traditional mortgage standards could play the spoiler this time around.

Whether that is enough to cause a recession will be determined by whether capital spending can take up the slack and generate reasonable increases in labour income. (The prognosis is not good: when consumption growth is trending at 2-2.5%, GDP tends to average just 1.5% as investment is a 'high-beta' component of growth. Still, it's theoretically possible.)

At the very least, we think soft growth is likely, with GDP running at perhaps 2%. Under those circumstances, a recession will be avoided, but the Fed would probably institute three or four 25bp rate cuts, similar to 1995. If so, a soft landing and rate cuts could provide a bullish backdrop for equities, providing a positive wealth effect to partially offset the negative housing wealth effect.

The darker scenario is that capital spending does not come to the rescue, housing wealth effects hurt, the personal saving ratio jumps and consumption declines. The decline in aggregate demand leads to employment losses, thereby creating a downward spiral. Although the consumer recession may only last a few quarters, the recovery proves difficult and mainly jobless for a few years, very much like the early 1990s and 2002-2003.

This time, however, with core inflation already so low, the loss of aggregate demand is likely to drive the core PCE inflation rate below the preferred 1-2% range, possibly with a greater risk of deflation than the 2003 scare (as growth was strong in 2003 but would be weak in this scenario).

How would Ben Bernanke act under such circumstances? Applying the continuity of Fed policy from Greenspan, the real Fed funds rate would be cut to below zero if possible – standard operating procedure in a recession. But with core PCE inflation falling or expected to fall below 1%, this would then have to involve the nominal Fed funds rate being cut to zero.

Then the whole debate of unconventional policy options, of which Bernanke himself was the protagonist with his famous 2002 deflation speech, will come back to the fore.

What we do know about Bernanke is that he is a self-confessed Great Depression buff, and his own work has concluded (in very strong terms) that it was mainly the steep decline in the money supply that led to the steep decline in GDP in the 1930s, and not the other way around. This supports the monetarist position of Milton Friedman, and goes against those who saw money supply declining as a passive response to the decline in output.

He came to this conclusion through a very large cross-country analysis of countries in the 1930s, and noted that those countries that abandoned the gold standard earlier tended to see output recover earlier, and those who hung on tended to suffer longer.

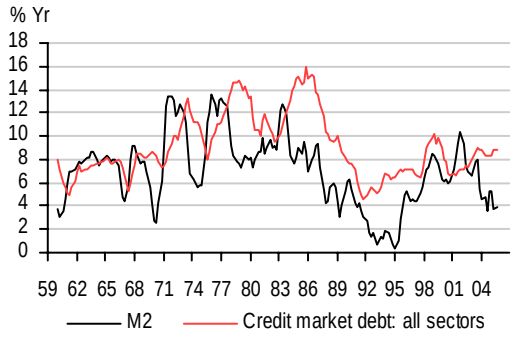
Charts 12A and 12B highlight the positive correlation between M2 and debt (total debt for the economy as well as household debt, of which most is mortgages). If anything, M2 tends to lead debt (real M2 is one of ten components in the US leading economic indicator), and is suggesting an imminent downturn in debt growth. Nominal M2 growth has fallen to below 4% and in real terms is down to 2% using core inflation. That's not a big concern for the Fed now, as money supply has long lost its allure to an interest rate target.

However, if the housing bubble is punctured, concerns about a consumer slump appear *and the level of nominal M2 money supply then declines*, then the odds of Bernanke slashing Fed funds to zero and aggressively resurrecting and updating

his unconventional policy options would increase sharply.

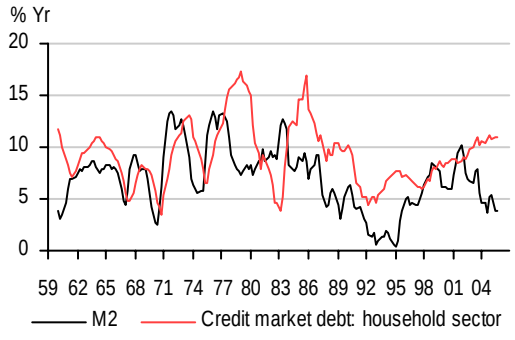
Presumably that could take 10-year Treasury note yields down to 2-3% in such an extreme environment. Would that then reflate housing and get the economy going again? Maybe, but it's no guarantee as zero rates didn't work in Japan. The odds are better that the Fed and Treasury would coordinate and act more aggressively and therefore more successfully than the sometimes difficult partnership between the Bank of Japan and Ministry of Finance, but the jury would be out for quite a while in this particular US scenario.

**12A. Money supply and total credit market debt growth**



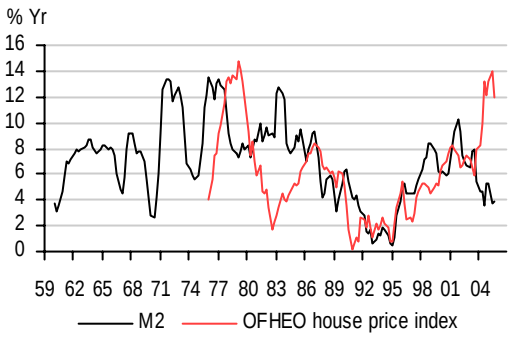

Source: Datastream, Federal Reserve

**12B. Money supply and household debt growth**




Source: Datastream, Federal Reserve

**12C. Money supply and house price growth**




Source: Datastream, Federal Reserve, Office of Federal Housing Enterprise Oversight

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# 12.1. Froth-finder scoreboard: states

**Average rank by category**

| Rank | Area | Price momentum | Price valuations | Rental yields | Homeowner costs | Risk premiums | Required capital gains | Average |
|---|---|---|---|---|---|---|---|---|
| **1** | District of Columbia | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| **2** | California | 1 | 1 | 2 | 1 | 6 | 2 | 2 |
| **3** | Rhode Island | 8 | 4 | 3 | 3 | 9 | 4 | 5 |
| **4** | Florida | 4 | 3 | 5 | 4 | 3 | 12 | 5 |
| **5** | Oregon | 13 | 4 | 8 | 4 | 1 | 5 | 6 |
| **6** | Nevada | 1 | 6 | 13 | 8 | 7 | 3 | 6 |
| **7** | Maryland | 7 | 6 | 9 | 4 | 5 | 8 | 7 |
| **8** | Massachusetts | 19 | 6 | 3 | 7 | 9 | 6 | 8 |
| **9** | Arizona | 6 | 11 | 11 | 13 | 7 | 10 | 10 |
| **10** | Montana | 21 | 11 | 5 | 9 | 3 | 10 | 10 |
| **11** | New Jersey | 10 | 9 | 12 | 10 | 16 | 6 | 11 |
| **12** | Hawaii | 5 | 10 | 17 | 10 | 18 | 13 | 12 |
| **13** | Maine | 15 | 17 | 7 | 16 | 9 | 16 | 13 |
| **14** | Washington | 17 | 13 | 15 | 12 | 15 | 9 | 14 |
| **15** | Virginia | 9 | 14 | 19 | 14 | 13 | 18 | 15 |
| **16** | Vermont | 14 | 18 | 10 | 18 | 12 | 20 | 15 |
| **17** | New York | 11 | 14 | 17 | 15 | 20 | 19 | 16 |
| **18** | Delaware | 11 | 16 | 20 | 17 | 17 | 21 | 17 |
| **19** | Wyoming | 23 | 23 | 14 | 21 | 13 | 14 | 18 |
| **20** | New Hampshire | 17 | 20 | 20 | 20 | 22 | 15 | 19 |
| **21** | Illinois | 27 | 18 | 16 | 19 | 19 | 25 | 21 |
| **22** | Connecticut | 16 | 21 | 27 | 23 | 27 | 17 | 22 |
| **23** | Minnesota | 25 | 24 | 20 | 21 | 21 | 21 | 22 |
| **24** | Wisconsin | 29 | 24 | 25 | 26 | 23 | 24 | 25 |
| **25** | Colorado | 38 | 24 | 24 | 24 | 24 | 21 | 26 |
| **26** | Pennsylvania | 19 | 27 | 26 | 27 | 26 | 32 | 26 |
| **27** | Alaska | 24 | 28 | 31 | 28 | 30 | 27 | 28 |
| **28** | Michigan | 47 | 22 | 23 | 24 | 25 | 29 | 28 |
| **29** | Idaho | 22 | 32 | 34 | 32 | 33 | 30 | 31 |
| **30** | North Dakota | 29 | 36 | 28 | 35 | 28 | 28 | 31 |
| **31** | Utah | 39 | 30 | 31 | 30 | 30 | 26 | 31 |
| **32** | South Dakota | 31 | 32 | 28 | 31 | 32 | 33 | 31 |
| **33** | Kentucky | 40 | 29 | 30 | 29 | 29 | 34 | 32 |
| **34** | New Mexico | 25 | 36 | 37 | 37 | 36 | 31 | 34 |
| **35** | South Carolina | 33 | 32 | 36 | 33 | 36 | 37 | 35 |
| **36** | West Virginia | 28 | 41 | 35 | 39 | 34 | 38 | 36 |
| **37** | Iowa | 43 | 39 | 33 | 36 | 34 | 36 | 37 |
| **38** | Georgia | 37 | 30 | 41 | 34 | 41 | 40 | 37 |
| **39** | Missouri | 31 | 35 | 40 | 37 | 40 | 42 | 38 |
| **40** | Tennessee | 40 | 43 | 37 | 41 | 38 | 43 | 40 |
| **41** | Kansas | 45 | 39 | 39 | 42 | 39 | 39 | 41 |
| **42** | Alabama | 35 | 43 | 43 | 43 | 42 | 44 | 42 |
| **43** | Ohio | 50 | 38 | 44 | 40 | 44 | 40 | 43 |
| **44** | Louisiana | 35 | 47 | 46 | 49 | 46 | 35 | 43 |
| **45** | Oklahoma | 43 | 48 | 42 | 47 | 42 | 47 | 45 |
| **46** | Arkansas | 33 | 48 | 47 | 48 | 47 | 46 | 45 |
| **47** | North Carolina | 42 | 42 | 49 | 44 | 48 | 45 | 45 |
| **48** | Nebraska | 47 | 45 | 45 | 45 | 45 | 48 | 46 |
| **49** | Indiana | 51 | 46 | 48 | 46 | 48 | 49 | 48 |
| **50** | Mississippi | 46 | 51 | 50 | 50 | 48 | 50 | 49 |
| **51** | Texas | 47 | 50 | 51 | 50 | 51 | 51 | 50 |

Source: HSBC. Categories include: Price momentum = 5-year real price growth; 1-year real price growth. Price valuations = price-to-income ratio; price to rent ratio. Rental yields = net rental yield; net rental yield less real 10-year note yield. Home owner costs = home owner costs to income; homeowner costs to rent; future homeowner costs to expected future rent. Risk premiums = ex-ante housing risk premium; ex-post housing risk premium. Required capital gains = required real capital gains using ex-ante housing risk premium (HRP); required real capital gains using ex-post HRP; required real capital gains using volatility-based HRP; required real capital gains using zero HRP

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# 12.2. Froth-finder scoreboard: cities

**Average rank by category**

| Rank | Area | Price momentum | Price valuations | Rental yields | Homeowner costs | Risk premiums | Required capital gains | Average |
|---|---|---|---|---|---|---|---|---|
| 1 | Riverside-San Bernardino-Ontario, CA | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | Miami-Miami Beach-Kendall, FL (MSAD) | 4 | 2 | 3 | 2 | 2 | 4 | 3 |
| 3 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 6 | 3 | 6 | 3 | 6 | 5 | 5 |
| 4 | Nassau-Suffolk, NY (MSAD) | 18 | 5 | 1 | 4 | 3 | 2 | 6 |
| 5 | Palm Bay-Melbourne-Titusville, FL | 2 | 9 | 4 | 9 | 4 | 12 | 7 |
| 6 | Sacramento-Arden-Arcade-Roseville, CA | 3 | 6 | 8 | 8 | 7 | 9 | 7 |
| 7 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 8 | 4 | 13 | 5 | 14 | 3 | 8 |
| 8 | San Diego-Carlsbad-San Marcos, CA | 8 | 8 | 14 | 7 | 15 | 6 | 10 |
| 9 | Oakland-Fremont-Hayward, CA (MSAD) | 13 | 6 | 16 | 6 | 16 | 7 | 11 |
| 10 | Providence-New Bedford-Fall River, RI-MA | 19 | 11 | 10 | 11 | 10 | 10 | 12 |
| 11 | Phoenix-Mesa-Scottdale, AZ | 12 | 13 | 7 | 15 | 11 | 20 | 13 |
| 12 | Seattle-Bellevue-Everett, WA (MSAD) | 30 | 15 | 5 | 12 | 5 | 13 | 13 |
| 13 | Baltimore-Towson, MD | 15 | 17 | 8 | 16 | 7 | 23 | 14 |
| 14 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 22 | 10 | 20 | 10 | 21 | 7 | 15 |
| 15 | Portland-Vancouver-Beaverton, OR-WA | 27 | 16 | 10 | 14 | 9 | 16 | 15 |
| 16 | New York-Wayne-White Plains, NY-NJ (MSAD) | 20 | 12 | 20 | 12 | 19 | 18 | 17 |
| 17 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 4 | 14 | 24 | 19 | 23 | 20 | 17 |
| 18 | Tucson, AZ | 20 | 17 | 16 | 20 | 12 | 22 | 18 |
| 19 | Las Vegas-Paradise, NV | 7 | 17 | 27 | 24 | 22 | 13 | 18 |
| 20 | Boston-Quincy, MA (MSAD) | 29 | 21 | 10 | 17 | 24 | 10 | 19 |
| 21 | Newark-Union, NJ-PA (MSAD) | 22 | 17 | 22 | 18 | 19 | 15 | 19 |
| 22 | Edison, NJ (MSAD) | 17 | 23 | 23 | 21 | 25 | 16 | 21 |
| 23 | Tampa-St. Petersburg-Clearwater, FL | 15 | 24 | 16 | 27 | 16 | 27 | 21 |
| 24 | Honolulu, HI | 11 | 21 | 28 | 22 | 29 | 18 | 22 |
| 25 | Virginia Beach-Norfolk-Newport News, VA-NC | 13 | 27 | 19 | 25 | 16 | 30 | 22 |
| 26 | Chicago-Naperville-Joliet, IL (MSAD) | 32 | 25 | 14 | 23 | 13 | 29 | 23 |
| 27 | Orlando, FL | 10 | 26 | 28 | 28 | 30 | 28 | 25 |
| 28 | Charleston-North Charleston, SC | 25 | 28 | 25 | 26 | 25 | 26 | 26 |
| 29 | Philadelphia, PA (MSAD) | 24 | 30 | 25 | 29 | 25 | 33 | 28 |
| 30 | Bridgeport-Stamford-Norwalk, CT | 27 | 31 | 33 | 30 | 33 | 24 | 30 |
| 31 | Minneapolis-St. Paul-Bloomington, MN-WI | 33 | 29 | 31 | 31 | 28 | 31 | 31 |
| 32 | New Haven-Milford, CT | 26 | 32 | 35 | 32 | 36 | 25 | 31 |
| 33 | Milwaukee-Waukesha-West Allis, WI | 34 | 34 | 36 | 34 | 33 | 34 | 34 |
| 34 | Denver-Aurora, CO | 50 | 34 | 32 | 32 | 31 | 32 | 35 |
| 35 | Detroit-Livonia-Dearborn, MI (MSAD) | 51 | 33 | 28 | 35 | 32 | 37 | 36 |
| 36 | Salt Lake City, UT | 43 | 36 | 34 | 36 | 33 | 35 | 36 |
| 37 | Hartford-West Hartford-East Hartford, CT | 31 | 37 | 38 | 37 | 39 | 36 | 36 |
| 38 | Albuquerque, NM | 34 | 39 | 42 | 41 | 40 | 40 | 39 |
| 39 | St. Louis, MO-IL | 36 | 39 | 38 | 40 | 38 | 45 | 39 |
| 40 | Nashville-Davidson-Murfreesboro, TN | 43 | 42 | 37 | 42 | 37 | 39 | 40 |
| 41 | Colorado Springs, CO | 38 | 38 | 46 | 39 | 48 | 38 | 41 |
| 42 | Kansas City, MO-KS | 42 | 43 | 44 | 43 | 42 | 41 | 43 |
| 43 | Cedar Rapids, IA | 51 | 45 | 38 | 38 | 46 | 43 | 44 |
| 44 | Atlanta-Sandy Springs-Marietta, GA | 45 | 41 | 44 | 44 | 42 | 46 | 44 |
| 45 | Columbus, OH | 46 | 44 | 47 | 46 | 45 | 44 | 45 |
| 46 | New Orleans-Metairie-Kenner, LA | 37 | 48 | 48 | 49 | 48 | 42 | 45 |
| 47 | Pittsburgh, PA | 40 | 47 | 43 | 45 | 41 | 56 | 45 |
| 48 | Buffalo-Niagara Falls, NY | 41 | 50 | 41 | 48 | 42 | 58 | 47 |
| 49 | Cleveland-Elyria-Mentor, OH | 56 | 45 | 49 | 47 | 47 | 48 | 49 |
| 50 | Cincinnati-Middletown, OH-KY-IN | 46 | 53 | 51 | 51 | 50 | 47 | 50 |
| 51 | Omaha-Council Bluffs, NE-IA | 49 | 49 | 50 | 50 | 50 | 50 | 50 |
| 52 | Austin-Round Rock, TX | 51 | 52 | 53 | 55 | 53 | 49 | 52 |
| 53 | Indianapolis, IN | 51 | 54 | 52 | 53 | 52 | 57 | 53 |
| 54 | San Antonio, TX | 39 | 57 | 57 | 57 | 58 | 55 | 54 |
| 55 | Greensboro-High Point, NC | 59 | 51 | 55 | 52 | 56 | 53 | 54 |
| 56 | Charlotte-Gastonia-Concord, NC-SC | 58 | 55 | 54 | 54 | 54 | 52 | 55 |
| 57 | Houston-Baytown-Sugar Land, TX | 46 | 59 | 57 | 58 | 57 | 51 | 55 |
| 58 | Memphis, TN-MS-AR | 51 | 56 | 56 | 56 | 55 | 54 | 55 |
| 59 | Dallas-Plano-Irving, TX (MSAD) | 57 | 57 | 59 | 59 | 58 | 59 | 58 |

Source: HSBC. Categories include: Price momentum = 5-year real price growth; 1-year real price growth. Price valuations = price-to-income ratio; price to rent ratio. Rental yields = net rental yield; net rental yield less real 10-year note yield. Home owner costs = home owner costs to income; homeowner costs to rent; future homeowner costs to expected future rent. Risk premiums = ex-ante housing risk premium; ex-post housing risk premium. Required capital gains = required real capital gains using ex-ante housing risk premium (HRP); required real capital gains using ex-post HRP; required real capital gains using volatility-based HRP; required real capital gains using zero HRP

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# Appendix A: Comparing US and UK valuations

- US bubble zone affordability as stretched as London
- Looking at US and UK price income ratios…
- …as well as comparable homeowner costs to income

## London valuations in the US

It appears the US 'bubble zone' may be even more overvalued than London.

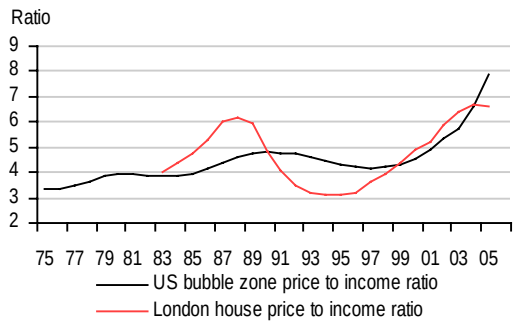
Chart A1 shows that the price-income ratio in the US 'bubble zone', at nearly 8 times, is higher than London at 6.6 times. London's PI ratio has historically been more volatile, but in the last couple of years, the US bubble zone PI has surged above and beyond that of London.

Chart A2 compares the US bubble zone's and London's homeowner-costs-to-income ratio. To make it comparable, we assume a 20% down payment, a 30-year loan and 1.5% of the home value for annual running costs.

The US bubble zone's ratio has moved sharply higher and the ratio is now higher than the late 1980s. In contrast, London's affordability is lower than the late 1980s, although still very high. Despite this, London house prices have flattened over the past couple of years, probably because the Bank of England has "jaw-boned" house price expectations down, suggesting that psychology, in addition to fundamentals, can play a major role in prices.

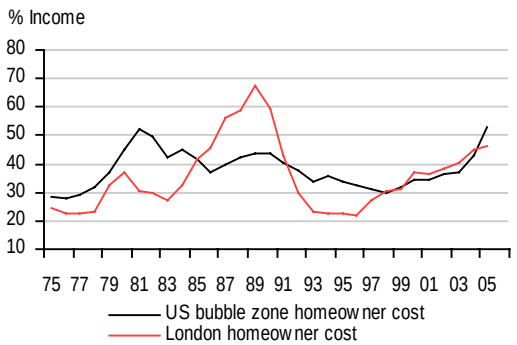
There is also an interesting regional gap story between the UK and US. For the past decade London outstripped the rest of the UK, but in recent years London prices have slowed while the rest of the UK has played catch-up. The valuation

**A1. Price-to-income in London and the US bubble zone**




Source: HSBC, UK Nationwide Building Society and the Office for National Statistics

**A2. Homeowner costs in London and the US bubble zone**




Source: HSBC, UK Nationwide Building Society and the Office for National Statistics

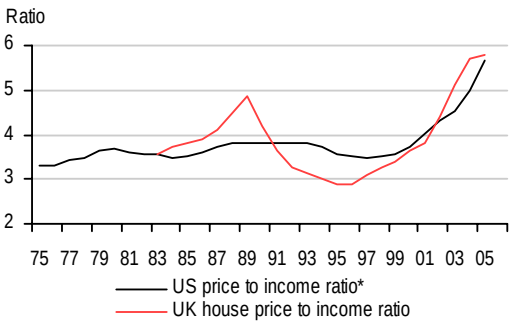
gap between London and the rest of the UK has closed dramatically, with the London PI at 6.6 times and UK PI ratio at 6 times currently. In contrast, the valuation gap between the US 'bubble' and 'non-bubble' zones is large.

If the US were to follow the UK example, this is good news for the US housing market: the US 'non-bubble zone' will in future years catch up with the 'bubble zone', while like London, the US 'bubble zone' might just see prices flatten out for a few years.

However, there are a number of risks to this view:

- the supply elasticity of homes in the US 'non-bubble' zone is greater than that in the UK, given relatively lots of land in the US centre
- the US 'housing bubble zone' affordability ratio looks stretched compared to London, suggesting hopes for a London-style soft landing for the US 'bubble-zone' could be misplaced
- the UK PI of 6 times is based on average prices while the US nationwide PI of 4.5 times is based on a median. Using our overall US weighted average of median metro prices (closer to a true average), the total US PI is over 5½ times, already quite close to the UK PI of 6 times. So perhaps the scope for catch-up might not be there after all.

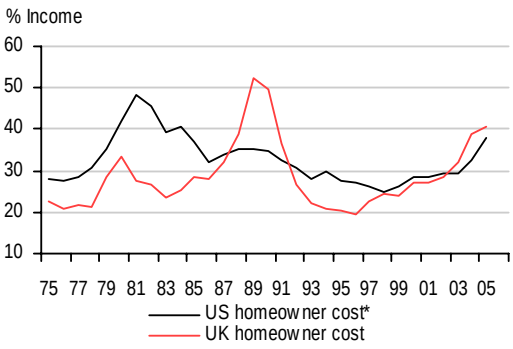
**A3. Price-to-income in the UK and the US**




Source: HSBC, UK Nationwide Building Society and the Office for National Statistics

* Weighted average of 151 metropolitan median house prices

**A4. Homeowner costs in the UK and the US**




Source: HSBC, UK Nationwide Building Society and the Office for National Statistics

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# Appendix B: Taxpayer Relief Act of 1997

- 1997 legislation created exclusion for gains on primary residences
- But pre-existing rules already allowed many home sellers to avoid capital gains
- Realized gains on primary residences are small relative to other asset types

## Taxpayer Relief Act of 1997

As long as home sellers have lived in their homes for two of the five years prior to the sale, the Taxpayer Relief Act of 1997 allows taxpayers who sold their homes after May 6, 1997, to exclude up to USD250,000 of capital gains on their primary residences, or up to USD500,000 for married taxpayers filing jointly.

However, the new exclusions replaced pre-existing rules which allowed sellers to avoid capital gains tax by rolling the gains into the purchase of a new residence, as well as a one-time exclusion of up to USD125,000 of capital gains on residences for taxpayers age 55 and over. Because of these available options prior to 1997, the majority of home sales already did not involve taxable capital gains.

Because of these pre-1997 options, the amount of realized taxable gains from primary residence sales has historically been very small. As table B1 shows, only USD3.6bn of taxable long-term capital gains in 1985 came from primary residence sales, out of a total of USD166.7bn. Taxable gains on residences are dwarfed by gains on other asset types such as corporate stock or residential rental property (which is not eligible for the post-1997 exclusion).

**B1. Net long-term capital gains from individual tax returns (USDbn)**

| | 1985 | 1997 | 1998 | 1999 |
|---|---|---|---|---|
| Total* | 166.7 | 331.6 | 437.7 | 490.6 |
| Corporate stock | 59.9 | 121.8 | 171.0 | 197.9 |
| Residential rental property | 17.6 | 14.3 | 17.6 | 24.3 |
| Residences | 3.6 | 5.1 | 2.2 | 3.7 |

Source: Internal Revenue Service. * Total includes other asset types not shown.

Gains on residences did decline from USD5.1bn in 1997 to USD2.2bn in 1998 (the first full year after the new exclusion) before rising up to USD3.7bn in 1999. Given that total capital gains were booming at the same time, the share of gains attributable to residences did decline after the 1997 law. But the impact of the USD2-3bn drop in gains on residences is tiny in the grand scheme of things, considering that total capital gains rose USD106bn in 1998 and USD53bn in 1999.

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# Appendix C: House prices, rents, and income

- Estimates for median house prices, rents, and incomes…
- …from 1975 to 2005Q3
- Includes 151 metro areas, 50 states, 9 regions, the US and customizable 'bubble' and 'non-bubble' zones

## House price estimates

### Dollar price benchmarks

To construct annual histories of house prices, we first needed a dollar price benchmark for each desired geographic area. For the US as a whole, we started with the National Association of Realtors' (NAR) median US existing home sales price of USD182,800 in 2004. We also took the NAR's 2004 median home price estimates for 151 metropolitan areas to use as benchmarks for those cities. For the 50 states and DC, we used median home values from the 2000 Census as our benchmarks.

### Constructing time series

Next, to calculate a time series history for each geography, we have used data from the Office of Federal Housing Enterprise Oversight (OFHEO) House Price Index. This quarterly data go back as far as 1975. We have averaged the quarterly index values for each year to get annual data. Combined with our dollar benchmarks, these allow us to calculate annual historical house prices.

The state house prices that are benchmarked to the 2000 Census are used to calculate the nine regional aggregates, weighted by housing units. In addition, we have also constructed an alternative set of state house price estimates based on the weighted average (by population) of MSA prices, and this is the version we use to calculate aggregates such as the bubble and non-bubble zones.

### Bubble and non-bubble zone prices

As a starting point, we have indicated the states that we think may comprise the bubble and non-bubble zones within the US, but the flexibility of *Home*Pulse allows changes to be made, with the zone aggregates adjusting accordingly.

## Rent estimates

### HUD fair market rents

The US Department of Housing and Urban Development (HUD) estimates fair market rents for a very broad range of geographic areas to determine the eligibility of rental housing units for housing assistance payments.

Based on data from (1) the US Census, (2) the American Housing Survey, (3) telephone surveys, and (4) CPI data on rents and utilities, HUD calculates dollar market rents for those who have moved into a rented housing unit within the past 18 months, so as to gauge current rental values. This is done for over 330 metropolitan areas and around

2,350 non-metropolitan county areas, with estimates going back to 1983. We have focused on the data for metropolitan areas, which account for 80% of the US population

### Adjusting to the 50th percentile

HUD currently bases its fair market rents at the 40th percentile level for most metropolitan areas. Because our aim was to examine median rents, we wanted rents calculated at the 50th percentile. For 2001-2005, the 50th percentile rents were published separately by HUD, which is what we use.

To adjust the rents from 1995 to 2001, we have raised the level of rents by the percentage difference between the 40th and 50th percentile rents in 2001, calculated for each metropolitan area (roughly a 6% increase for the nation as a whole). From 1983 to 1995, fair market rents were calculated by HUD at the 45th percentile level, so we have adjusted rents by half of the percent difference in 40th and 50th percentile level rents (i.e. 3% for the US). Working in reverse from the 1983 median rents, we have used the primary rent series from the CPI to calculate rents from 1975-1982 for each geographic area.

### Adjusting for bedroom size

Because we utilized the HUD's rent-data for two-bedroom units, we also needed to adjust for the fact that the median house has three bedrooms, according to the Census. To account for this, we raised the level of all rents by 30%.

### Adjusting for utilities

Since the HUD's data are estimates of gross rents, which include the cost of utilities, we also needed to make an adjustment in order to only reflect the shelter component of the rent costs. We reduced the level of rents by 10% to strip out the utilities component of gross rents.

### Calculating aggregates

Finally, to calculate aggregate rents for the US and for the states, we have constructed weighted averages of the metropolitan areas, based on population. Although we only show the metro area rents for the 151 MSAs that we also have house price estimates for, our state and national rent estimates are based on the full set of over 330 metropolitan areas. We then calculated rents for the nine Census regions and for the bubble and non-bubble zones based on our state estimates.

## Income estimates

### Census estimates back to 1984

For the 50 states and DC, we have used the Census Bureau historical data on median household income directly for the available years from 1984-2004. These estimates come from the Census' Annual Social and Economic Supplement to the Current Population Survey. For the first three quarters of 2005, we estimated that median incomes grew at their average annual pace of the past 12 years.

### Estimating state and local incomes prior to 1984

The Census also maintains historical US median household income data back to 1975. We have used the US data as a baseline to estimate the missing years of state and MSA median income data (mostly 1975-1984).

We first calculated the percent deviation of BEA estimates of per capita income for states and MSAs relative to US per capita income. These ratios are then applied to median US income to generate estimates of state and MSA median income.

The Census Bureau also provides data on 1999 median household income for selected MSAs. Where available, we have benchmarked these median income estimates to the 1999 Census data.

## Table guides

Table C1 shows our house price estimates by state for 1975, 1985, 1995, and Q3 2005. Table C2 shows house prices by city as well as the years when the respective OFHEO house price indexes initially become available.

Tables C3 and C4 show median monthly rents by state and city for 1975, 1985, 1995, and Q3 2005.

Tables C5 and C6 show median annual pre-tax household income by state and city for 1975, 1985, 1995, and 2005

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# C.1. Median house price: states

| Number | Area | 1975 | 1985 | 1995 | Q3 2005 |
|---|---|---|---|---|---|
| | United States | 35,205 | 71,848 | 105,715 | 209,536 |
| | United States (average)* | 39,125 | 82,711 | 121,861 | 257,574 |
| | | | | | |
| | Total Bubble Zone | 42,350 | 101,721 | 154,833 | 385,440 |
| | Eastern Bubble Zone | 41,820 | 93,652 | 137,536 | 323,598 |
| | Western Bubble Zone | 43,159 | 114,034 | 181,227 | 479,806 |
| | Non-Bubble Zone | 36,721 | 68,541 | 97,286 | 162,270 |
| | | | | | |
| 1 | Alabama | 29,722 | 50,348 | 71,270 | 109,489 |
| 2 | Alaska | 56,497 | 120,504 | 123,990 | 210,310 |
| 3 | Arizona | 35,283 | 76,005 | 95,240 | 217,826 |
| 4 | Arkansas | 25,371 | 48,903 | 62,821 | 95,653 |
| 5 | California | 34,250 | 99,780 | 157,296 | 456,737 |
| 6 | Colorado | 33,745 | 78,253 | 116,251 | 218,112 |
| 7 | Connecticut | 38,419 | 97,722 | 136,756 | 276,576 |
| 8 | Delaware | 37,196 | 68,773 | 111,211 | 222,345 |
| 9 | District of Columbia | 30,138 | 71,400 | 118,152 | 349,907 |
| 10 | Florida | 37,173 | 66,130 | 85,802 | 212,555 |
| 11 | Georgia | 34,944 | 63,089 | 85,237 | 145,584 |
| 12 | Hawaii | 65,077 | 136,105 | 305,304 | 553,612 |
| 13 | Idaho | 33,831 | 59,741 | 93,217 | 152,057 |
| 14 | Illinois | 35,207 | 61,267 | 107,440 | 185,698 |
| 15 | Indiana | 28,823 | 50,319 | 77,573 | 114,500 |
| 16 | Iowa | 27,195 | 44,477 | 66,757 | 104,454 |
| 17 | Kansas | 29,184 | 50,620 | 65,922 | 105,825 |
| 18 | Kentucky | 27,202 | 45,365 | 69,996 | 109,809 |
| 19 | Louisiana | 28,762 | 59,280 | 68,376 | 111,660 |
| 20 | Maine | 22,892 | 52,673 | 77,872 | 166,704 |
| 21 | Maryland | 38,639 | 77,879 | 127,105 | 283,000 |
| 22 | Massachusetts | 29,693 | 92,984 | 126,869 | 316,410 |
| 23 | Michigan | 27,602 | 45,460 | 81,833 | 145,098 |
| 24 | Minnesota | 30,868 | 61,893 | 87,849 | 189,705 |
| 25 | Mississippi | 28,552 | 47,387 | 58,571 | 88,258 |
| 26 | Missouri | 29,047 | 52,591 | 71,782 | 121,602 |
| 27 | Montana | 26,660 | 53,723 | 83,340 | 148,847 |
| 28 | Nebraska | 28,315 | 49,492 | 70,328 | 109,055 |
| 29 | Nevada | 39,893 | 87,181 | 125,698 | 283,537 |
| 30 | New Hampshire | 29,954 | 77,997 | 94,577 | 229,152 |
| 31 | New Jersey | 36,813 | 90,249 | 138,580 | 315,015 |
| 32 | New Mexico | 31,197 | 68,516 | 98,436 | 151,604 |
| 33 | New York | 32,948 | 79,940 | 118,308 | 259,824 |
| 34 | North Carolina | 31,547 | 59,976 | 87,304 | 136,690 |
| 35 | North Dakota | 29,369 | 51,005 | 64,065 | 102,987 |
| 36 | Ohio | 30,458 | 51,867 | 84,052 | 128,157 |
| 37 | Oklahoma | 26,793 | 56,284 | 58,197 | 90,198 |
| 38 | Oregon | 31,690 | 59,275 | 120,027 | 230,656 |
| 39 | Pennsylvania | 29,465 | 50,841 | 85,105 | 149,309 |
| 40 | Rhode Island | 30,185 | 64,541 | 109,658 | 269,851 |
| 41 | South Carolina | 28,949 | 53,085 | 74,895 | 124,818 |
| 42 | South Dakota | 26,661 | 43,583 | 65,152 | 105,535 |
| 43 | Tennessee | 29,256 | 52,913 | 75,594 | 117,696 |
| 44 | Texas | 30,537 | 65,163 | 67,305 | 102,745 |
| 45 | Utah | 34,853 | 71,287 | 118,114 | 182,639 |
| 46 | Vermont | 32,765 | 57,879 | 94,707 | 183,543 |
| 47 | Virginia | 36,129 | 69,182 | 104,805 | 226,285 |
| 48 | Washington | 29,292 | 68,781 | 132,599 | 252,325 |
| 49 | West Virginia | 31,114 | 44,879 | 62,428 | 99,270 |
| 50 | Wisconsin | 32,118 | 53,379 | 88,740 | 154,675 |
| 51 | Wyoming | 31,603 | 60,902 | 80,707 | 144,596 |

Source: HSBC. * Weighted average of 151 metropolitan area median house prices.

HSBC

# C.2. Median house price: cities

| Number | Area | First year of available data | 1980 | 1985 | 1995 | Q3 2005 |
|---|---|---|---|---|---|---|
| 1 | Albuquerque, NM | 1977 | 60,058 | 77,436 | 114,034 | 167,445 |
| 2 | Atlanta-Sandy Springs-Marietta, GA | 1975 | 54,179 | 72,307 | 97,297 | 166,310 |
| 3 | Austin-Round Rock, TX | 1977 | 61,079 | 96,194 | 101,875 | 164,677 |
| 4 | Baltimore-Towson, MD | 1976 | 59,961 | 75,797 | 121,763 | 268,294 |
| 5 | Boston-Quincy, MA (MSAD) | 1978 | 57,769 | 118,800 | 162,775 | 428,892 |
| 6 | Bridgeport-Stamford-Norwalk, CT | 1976 | 99,525 | 164,910 | 225,762 | 504,374 |
| 7 | Buffalo-Niagara Falls, NY | 1978 | 36,686 | 43,575 | 74,985 | 101,894 |
| 8 | Cedar Rapids, IA | 1983 | - | 57,497 | 96,025 | 135,034 |
| 9 | Charleston-North Charleston, SC | 1979 | 51,096 | 68,790 | 94,735 | 216,865 |
| 10 | Charlotte-Gastonia-Concord, NC-SC | 1977 | 60,814 | 77,929 | 116,473 | 176,053 |
| 11 | Chicago-Naperville-Joliet, IL (MSAD) | 1975 | 67,217 | 80,145 | 144,753 | 268,014 |
| 12 | Cincinnati-Middletown, OH-KY-IN | 1976 | 56,640 | 61,997 | 97,607 | 150,867 |
| 13 | Cleveland-Elyria-Mentor, OH | 1975 | 53,026 | 57,055 | 95,615 | 142,607 |
| 14 | Colorado Springs, CO | 1979 | 65,051 | 83,058 | 117,393 | 202,579 |
| 15 | Columbus, OH | 1976 | 53,890 | 62,469 | 100,837 | 154,833 |
| 16 | Dallas-Plano-Irving, TX (MSAD) | 1976 | 71,721 | 97,756 | 94,384 | 144,161 |
| 17 | Denver-Aurora, CO | 1976 | 74,609 | 92,815 | 129,395 | 250,366 |
| 18 | Detroit-Livonia-Dearborn, MI (MSAD) | 1976 | 50,760 | 47,372 | 89,376 | 165,724 |
| 19 | Edison, NJ (MSAD) | 1976 | 70,460 | 103,938 | 159,293 | 386,285 |
| 20 | Greensboro-High Point, NC | 1978 | 55,307 | 71,471 | 101,153 | 146,537 |
| 21 | Hartford-West Hartford-East Hartford, CT | 1978 | 70,319 | 99,496 | 140,642 | 260,759 |
| 22 | Honolulu, HI | 1977 | 133,480 | 150,633 | 350,967 | 587,356 |
| 23 | Houston-Baytown-Sugar Land, TX | 1976 | 80,218 | 83,744 | 89,247 | 143,008 |
| 24 | Indianapolis, IN | 1977 | 49,891 | 57,235 | 88,708 | 128,193 |
| 25 | Kansas City, MO-KS | 1976 | 64,621 | 71,499 | 92,776 | 159,368 |
| 26 | Las Vegas-Paradise, NV | 1978 | 91,068 | 102,868 | 144,195 | 328,456 |
| 27 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 1975 | 103,935 | 128,248 | 197,199 | 560,445 |
| 28 | Memphis, TN-MS-AR | 1977 | 58,695 | 72,864 | 98,048 | 144,930 |
| 29 | Miami-Miami Beach-Kendall, FL (MSAD) | 1976 | 83,347 | 91,770 | 137,853 | 365,725 |
| 30 | Milwaukee-Waukesha-West Allis, WI | 1977 | 69,556 | 72,502 | 122,983 | 220,142 |
| 31 | Minneapolis-St. Paul-Bloomington, MN-WI | 1976 | 65,637 | 75,662 | 107,143 | 237,935 |
| 32 | Nashville-Davidson-Murfreesboro, TN | 1979 | 50,417 | 67,520 | 98,793 | 157,743 |
| 33 | Nassau-Suffolk, NY (MSAD) | 1975 | 53,929 | 124,589 | 175,472 | 482,460 |
| 34 | New Haven-Milford, CT | 1978 | 63,392 | 98,833 | 140,439 | 286,921 |
| 35 | New Orleans-Metairie-Kenner, LA | 1977 | 64,640 | 72,939 | 85,455 | 150,188 |
| 36 | New York-Wayne-White Plains, NY-NJ (MSAD) | 1976 | 75,693 | 138,967 | 210,159 | 514,087 |
| 37 | Newark-Union, NJ-PA (MSAD) | 1976 | 79,418 | 128,632 | 194,661 | 438,050 |
| 38 | Oakland-Fremont-Hayward, CA (MSAD) | 1975 | 133,568 | 166,805 | 269,776 | 804,363 |
| 39 | Omaha-Council Bluffs, NE-IA | 1978 | 53,073 | 63,434 | 87,021 | 139,214 |
| 40 | Orlando, FL | 1978 | 59,608 | 78,789 | 97,141 | 223,226 |
| 41 | Palm Bay-Melbourne-Titusville, FL | 1980 | 54,473 | 68,912 | 82,038 | 206,118 |
| 42 | Philadelphia, PA (MSAD) | 1976 | 47,919 | 64,676 | 108,567 | 216,288 |
| 43 | Phoenix-Mesa-Scottdale, AZ | 1977 | 63,775 | 81,369 | 96,309 | 233,459 |
| 44 | Pittsburgh, PA | 1976 | 45,234 | 49,795 | 78,645 | 120,626 |
| 45 | Portland-Vancouver-Beaverton, OR-WA | 1976 | 64,762 | 64,258 | 128,874 | 246,879 |
| 46 | Providence-New Bedford-Fall River, RI-MA | 1976 | 53,979 | 77,949 | 128,112 | 317,902 |
| 47 | Riverside-San Bernardino-Ontario, CA | 1976 | 83,552 | 97,771 | 131,623 | 374,844 |
| 48 | Sacramento-Arden-Arcade-Roseville, CA | 1976 | 76,505 | 90,807 | 142,538 | 398,424 |
| 49 | Salt Lake City, UT | 1977 | 54,943 | 65,794 | 112,230 | 176,281 |
| 50 | San Antonio, TX | 1979 | 66,129 | 87,354 | 91,306 | 133,990 |
| 51 | San Diego-Carlsbad-San Marcos, CA | 1976 | 115,079 | 135,856 | 210,517 | 650,378 |
| 52 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 1975 | 122,428 | 152,711 | 276,493 | 767,777 |
| 53 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 1975 | 140,117 | 171,837 | 256,652 | 767,372 |
| 54 | Seattle-Bellevue-Everett, WA (MSAD) | 1975 | 73,628 | 82,500 | 159,149 | 333,135 |
| 55 | St. Louis, MO-IL | 1975 | 49,609 | 58,725 | 79,733 | 140,280 |
| 56 | Tampa-St. Petersburg-Clearwater, FL | 1976 | 49,714 | 66,732 | 82,754 | 200,581 |
| 57 | Tucson, AZ | 1977 | 66,365 | 77,545 | 109,983 | 226,331 |
| 58 | Virginia Beach-Norfolk-Newport News, VA-NC | 1977 | 52,299 | 72,674 | 95,925 | 206,953 |
| 59 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 1975 | 85,627 | 108,497 | 172,945 | 431,606 |

Source: HSBC

HSBC

# C.3. Median monthly rent: states

| Number | Area | 1975 | 1985 | 1995 | Q3 2005 |
|---|---|---|---|---|---|
| | United States | 287 | 524 | 776 | 1,036 |
| | | | | | |
| | Total Bubble Zone | 311 | 567 | 877 | 1,179 |
| | Eastern Bubble Zone | 303 | 547 | 862 | 1,150 |
| | Western Bubble Zone | 323 | 597 | 900 | 1,222 |
| | Non-Bubble Zone | 260 | 471 | 648 | 850 |
| | | | | | |
| 1 | Alabama | 222 | 398 | 535 | 694 |
| 2 | Alaska | 462 | 847 | 913 | 1,116 |
| 3 | Arizona | 290 | 532 | 684 | 954 |
| 4 | Arkansas | 212 | 381 | 542 | 695 |
| 5 | California | 343 | 641 | 978 | 1,366 |
| 6 | Colorado | 314 | 566 | 715 | 1,023 |
| 7 | Connecticut | 304 | 573 | 984 | 1,210 |
| 8 | Delaware | 280 | 504 | 757 | 985 |
| 9 | District of Columbia | 295 | 597 | 1,052 | 1,424 |
| 10 | Florida | 294 | 526 | 763 | 988 |
| 11 | Georgia | 259 | 474 | 694 | 926 |
| 12 | Hawaii | 352 | 632 | 1,376 | 1,405 |
| 13 | Idaho | 238 | 438 | 596 | 792 |
| 14 | Illinois | 339 | 612 | 832 | 1,024 |
| 15 | Indiana | 241 | 434 | 623 | 815 |
| 16 | Iowa | 251 | 451 | 605 | 773 |
| 17 | Kansas | 225 | 456 | 606 | 747 |
| 18 | Kentucky | 240 | 430 | 568 | 693 |
| 19 | Louisiana | 237 | 423 | 561 | 752 |
| 20 | Maine | 289 | 519 | 754 | 967 |
| 21 | Maryland | 305 | 545 | 811 | 1,056 |
| 22 | Massachusetts | 341 | 611 | 920 | 1,409 |
| 23 | Michigan | 272 | 487 | 687 | 900 |
| 24 | Minnesota | 303 | 543 | 730 | 1,058 |
| 25 | Mississippi | 250 | 449 | 567 | 750 |
| 26 | Missouri | 249 | 452 | 581 | 836 |
| 27 | Montana | 267 | 488 | 599 | 710 |
| 28 | Nebraska | 246 | 443 | 611 | 805 |
| 29 | Nevada | 305 | 555 | 807 | 1,085 |
| 30 | New Hampshire | 310 | 556 | 834 | 1,230 |
| 31 | New Jersey | 318 | 592 | 1,087 | 1,319 |
| 32 | New Mexico | 237 | 443 | 677 | 829 |
| 33 | New York | 303 | 545 | 925 | 1,267 |
| 34 | North Carolina | 243 | 435 | 612 | 855 |
| 35 | North Dakota | 252 | 452 | 561 | 684 |
| 36 | Ohio | 236 | 423 | 610 | 796 |
| 37 | Oklahoma | 275 | 490 | 553 | 717 |
| 38 | Oregon | 258 | 460 | 690 | 873 |
| 39 | Pennsylvania | 264 | 498 | 717 | 923 |
| 40 | Rhode Island | 248 | 447 | 816 | 1,080 |
| 41 | South Carolina | 232 | 416 | 588 | 763 |
| 42 | South Dakota | 247 | 443 | 610 | 765 |
| 43 | Tennessee | 244 | 436 | 563 | 760 |
| 44 | Texas | 256 | 455 | 664 | 876 |
| 45 | Utah | 269 | 510 | 572 | 813 |
| 46 | Vermont | 331 | 590 | 804 | 1,038 |
| 47 | Virginia | 282 | 503 | 650 | 910 |
| 48 | Washington | 293 | 522 | 769 | 967 |
| 49 | West Virginia | 238 | 426 | 501 | 650 |
| 50 | Wisconsin | 256 | 462 | 651 | 826 |
| 51 | Wyoming | 294 | 534 | 674 | 773 |

Source: HSBC

HSBC

# C.4. Median monthly rent: cities

| Number | Area | 1975 | 1985 | 1995 | Q3 2005 |
|---|---|---|---|---|---|
| 1 | Albuquerque, NM | 254 | 465 | 683 | 839 |
| 2 | Atlanta-Sandy Springs-Marietta, GA | 266 | 490 | 745 | 1,001 |
| 3 | Austin-Round Rock, TX | 300 | 533 | 783 | 1,094 |
| 4 | Baltimore-Towson, MD | 310 | 554 | 837 | 1,089 |
| 5 | Boston-Quincy, MA (MSAD) | 371 | 662 | 996 | 1,626 |
| 6 | Bridgeport-Stamford-Norwalk, CT | 300 | 538 | 912 | 1,193 |
| 7 | Buffalo-Niagara Falls, NY | 269 | 485 | 626 | 778 |
| 8 | Cedar Rapids, IA | 248 | 446 | 571 | 748 |
| 9 | Charleston-North Charleston, SC | 258 | 460 | 606 | 815 |
| 10 | Charlotte-Gastonia-Concord, NC-SC | 263 | 468 | 635 | 923 |
| 11 | Chicago-Naperville-Joliet, IL (MSAD) | 359 | 649 | 888 | 1,087 |
| 12 | Cincinnati-Middletown, OH-KY-IN | 227 | 407 | 610 | 820 |
| 13 | Cleveland-Elyria-Mentor, OH | 243 | 436 | 640 | 844 |
| 14 | Colorado Springs, CO | 250 | 458 | 629 | 931 |
| 15 | Columbus, OH | 234 | 422 | 609 | 825 |
| 16 | Dallas-Plano-Irving, TX (MSAD) | 262 | 479 | 721 | 1,042 |
| 17 | Denver-Aurora, CO | 341 | 610 | 754 | 1,066 |
| 18 | Detroit-Livonia-Dearborn, MI (MSAD) | 282 | 504 | 716 | 966 |
| 19 | Edison, NJ (MSAD) | 336 | 619 | 1,187 | 1,543 |
| 20 | Greensboro-High Point, NC | 233 | 416 | 597 | 797 |
| 21 | Hartford-West Hartford-East Hartford, CT | 297 | 582 | 885 | 1,108 |
| 22 | Honolulu, HI | 352 | 632 | 1,376 | 1,405 |
| 23 | Houston-Baytown-Sugar Land, TX | 270 | 465 | 709 | 880 |
| 24 | Indianapolis, IN | 238 | 428 | 645 | 845 |
| 25 | Kansas City, MO-KS | 258 | 470 | 603 | 829 |
| 26 | Las Vegas-Paradise, NV | 294 | 535 | 805 | 1,088 |
| 27 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 387 | 705 | 1,097 | 1,445 |
| 28 | Memphis, TN-MS-AR | 232 | 413 | 553 | 807 |
| 29 | Miami-Miami Beach-Kendall, FL (MSAD) | 354 | 638 | 947 | 1,115 |
| 30 | Milwaukee-Waukesha-West Allis, WI | 279 | 504 | 697 | 881 |
| 31 | Minneapolis-St. Paul-Bloomington, MN-WI | 311 | 557 | 756 | 1,114 |
| 32 | Nashville-Davidson-Murfreesboro, TN | 269 | 481 | 640 | 823 |
| 33 | Nassau-Suffolk, NY (MSAD) | 376 | 684 | 1,274 | 1,577 |
| 34 | New Haven-Milford, CT | 298 | 533 | 998 | 1,151 |
| 35 | New Orleans-Metairie-Kenner, LA | 250 | 447 | 605 | 857 |
| 36 | New York-Wayne-White Plains, NY-NJ (MSAD) | 327 | 628 | 977 | 1,422 |
| 37 | Newark-Union, NJ-PA (MSAD) | 296 | 560 | 1,067 | 1,224 |
| 38 | Oakland-Fremont-Hayward, CA (MSAD) | 342 | 692 | 1,022 | 1,610 |
| 39 | Omaha-Council Bluffs, NE-IA | 243 | 437 | 623 | 826 |
| 40 | Orlando, FL | 289 | 515 | 763 | 1,044 |
| 41 | Palm Bay-Melbourne-Titusville, FL | 288 | 514 | 685 | 835 |
| 42 | Philadelphia, PA (MSAD) | 276 | 548 | 863 | 1,097 |
| 43 | Phoenix-Mesa-Scottdale, AZ | 299 | 545 | 686 | 980 |
| 44 | Pittsburgh, PA | 267 | 483 | 581 | 816 |
| 45 | Portland-Vancouver-Beaverton, OR-WA | 262 | 460 | 703 | 898 |
| 46 | Providence-New Bedford-Fall River, RI-MA | 248 | 447 | 816 | 1,080 |
| 47 | Riverside-San Bernardino-Ontario, CA | 311 | 570 | 784 | 958 |
| 48 | Sacramento-Arden-Arcade-Roseville, CA | 287 | 523 | 780 | 1,165 |
| 49 | Salt Lake City, UT | 279 | 510 | 571 | 818 |
| 50 | San Antonio, TX | 267 | 476 | 646 | 859 |
| 51 | San Diego-Carlsbad-San Marcos, CA | 329 | 620 | 850 | 1,420 |
| 52 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 387 | 713 | 1,258 | 1,954 |
| 53 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 375 | 710 | 1,088 | 1,580 |
| 54 | Seattle-Bellevue-Everett, WA (MSAD) | 323 | 567 | 831 | 1,049 |
| 55 | St. Louis, MO-IL | 259 | 469 | 587 | 889 |
| 56 | Tampa-St. Petersburg-Clearwater, FL | 264 | 470 | 690 | 966 |
| 57 | Tucson, AZ | 269 | 493 | 681 | 848 |
| 58 | Virginia Beach-Norfolk-Newport News, VA-NC | 290 | 518 | 681 | 946 |
| 59 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 295 | 597 | 1,052 | 1,424 |

Source: HSBC

HSBC

# C.5. Median household income: states

| Number | Area | 1975 | 1985 | 1995 | Q3 2005 |
|---|---|---|---|---|---|
| | United States | 11,800 | 23,618 | 34,076 | 45,439 |
| | | | | | |
| | Total Bubble Zone | 12,655 | 25,643 | 35,661 | 49,087 |
| | Eastern Bubble Zone | 12,413 | 25,557 | 35,312 | 48,964 |
| | Western Bubble Zone | 13,024 | 25,774 | 36,193 | 49,276 |
| | Non-Bubble Zone | 11,010 | 22,368 | 33,223 | 43,209 |
| | | | | | |
| **1** | Alabama | 9,110 | 18,333 | 25,991 | 37,445 |
| **2** | Alaska | 20,424 | 34,782 | 47,954 | 56,321 |
| **3** | Arizona | 10,601 | 23,877 | 30,863 | 44,880 |
| **4** | Arkansas | 8,917 | 17,451 | 25,814 | 35,834 |
| **5** | California | 13,630 | 26,981 | 37,009 | 50,336 |
| **6** | Colorado | 12,108 | 28,182 | 40,706 | 52,473 |
| **7** | Connecticut | 13,874 | 31,090 | 40,243 | 56,535 |
| **8** | Delaware | 12,890 | 22,980 | 34,928 | 48,967 |
| **9** | District of Columbia | 15,368 | 21,076 | 30,748 | 44,497 |
| **10** | Florida | 11,301 | 21,343 | 29,745 | 41,569 |
| **11** | Georgia | 9,859 | 21,049 | 34,099 | 41,930 |
| **12** | Hawaii | 14,165 | 28,961 | 42,851 | 57,633 |
| **13** | Idaho | 10,630 | 20,761 | 32,676 | 45,719 |
| **14** | Illinois | 13,404 | 24,870 | 38,071 | 47,262 |
| **15** | Indiana | 11,152 | 22,675 | 33,385 | 43,414 |
| **16** | Iowa | 11,890 | 20,927 | 35,519 | 44,668 |
| **17** | Kansas | 11,861 | 22,788 | 30,341 | 41,847 |
| **18** | Kentucky | 9,435 | 17,361 | 29,810 | 36,595 |
| **19** | Louisiana | 9,490 | 21,179 | 27,949 | 37,309 |
| **20** | Maine | 9,615 | 20,519 | 33,858 | 42,315 |
| **21** | Maryland | 13,178 | 30,136 | 41,041 | 58,872 |
| **22** | Massachusetts | 12,349 | 28,207 | 38,574 | 53,621 |
| **23** | Michigan | 12,056 | 24,242 | 36,426 | 43,150 |
| **24** | Minnesota | 11,898 | 23,856 | 37,933 | 58,073 |
| **25** | Mississippi | 8,036 | 16,413 | 26,538 | 36,047 |
| **26** | Missouri | 11,005 | 21,939 | 34,825 | 43,248 |
| **27** | Montana | 11,093 | 20,236 | 27,757 | 34,591 |
| **28** | Nebraska | 11,811 | 21,799 | 32,929 | 44,811 |
| **29** | Nevada | 13,465 | 23,274 | 36,084 | 48,521 |
| **30** | New Hampshire | 10,722 | 26,403 | 39,171 | 58,262 |
| **31** | New Jersey | 13,492 | 30,980 | 43,924 | 56,711 |
| **32** | New Mexico | 9,663 | 20,423 | 25,991 | 40,544 |
| **33** | New York | 13,329 | 23,639 | 33,028 | 45,708 |
| **34** | North Carolina | 9,647 | 21,451 | 31,979 | 41,340 |
| **35** | North Dakota | 12,165 | 21,205 | 29,089 | 40,222 |
| **36** | Ohio | 11,664 | 25,174 | 34,941 | 43,866 |
| **37** | Oklahoma | 10,509 | 21,205 | 26,311 | 40,796 |
| **38** | Oregon | 11,834 | 21,894 | 36,374 | 41,946 |
| **39** | Pennsylvania | 11,823 | 22,877 | 34,524 | 45,231 |
| **40** | Rhode Island | 11,198 | 24,625 | 35,359 | 49,526 |
| **41** | South Carolina | 9,045 | 20,036 | 29,071 | 39,655 |
| **42** | South Dakota | 10,877 | 18,142 | 29,578 | 42,336 |
| **43** | Tennessee | 9,605 | 17,778 | 29,015 | 39,298 |
| **44** | Texas | 10,987 | 23,743 | 32,039 | 42,352 |
| **45** | Utah | 9,903 | 25,238 | 36,480 | 52,257 |
| **46** | Vermont | 9,936 | 26,000 | 33,824 | 48,670 |
| **47** | Virginia | 11,397 | 28,429 | 36,222 | 52,508 |
| **48** | Washington | 12,513 | 24,000 | 35,568 | 51,095 |
| **49** | West Virginia | 9,512 | 15,983 | 24,880 | 34,284 |
| **50** | Wisconsin | 11,636 | 23,246 | 40,955 | 46,948 |
| **51** | Wyoming | 12,852 | 22,081 | 31,529 | 46,640 |

Source: HSBC

HSBC

# C.6. Median household income: cities

| Number | Area | 1975 | 1985 | 1995 | Q3 2005 |
|---|---|---|---|---|---|
| 1 | Albuquerque, NM | 11,330 | 24,224 | 34,739 | 45,367 |
| 2 | Atlanta-Sandy Springs-Marietta, GA | 13,261 | 28,802 | 42,782 | 54,804 |
| 3 | Austin-Round Rock, TX | 11,265 | 26,108 | 35,983 | 48,516 |
| 4 | Baltimore-Towson, MD | 12,660 | 26,337 | 37,381 | 53,243 |
| 5 | Boston-Quincy, MA (MSAD) | 12,573 | 27,456 | 42,814 | 62,314 |
| 6 | Bridgeport-Stamford-Norwalk, CT | 16,245 | 36,949 | 61,947 | 88,922 |
| 7 | Buffalo-Niagara Falls, NY | 12,004 | 23,458 | 33,142 | 43,524 |
| 8 | Cedar Rapids, IA | 13,755 | 25,795 | 37,630 | 51,067 |
| 9 | Charleston-North Charleston, SC | 11,138 | 22,599 | 31,905 | 46,012 |
| 10 | Charlotte-Gastonia-Concord, NC-SC | 10,996 | 23,867 | 38,067 | 49,673 |
| 11 | Chicago-Naperville-Joliet, IL (MSAD) | 15,136 | 28,891 | 43,067 | 54,615 |
| 12 | Cincinnati-Middletown, OH-KY-IN | 12,218 | 24,717 | 36,930 | 50,255 |
| 13 | Cleveland-Elyria-Mentor, OH | 12,692 | 24,977 | 36,126 | 45,805 |
| 14 | Colorado Springs, CO | 12,258 | 27,350 | 37,182 | 52,052 |
| 15 | Columbus, OH | 12,293 | 25,251 | 37,376 | 50,384 |
| 16 | Dallas-Plano-Irving, TX (MSAD) | 12,615 | 28,879 | 38,126 | 50,254 |
| 17 | Denver-Aurora, CO | 13,862 | 28,462 | 41,077 | 58,100 |
| 18 | Detroit-Livonia-Dearborn, MI (MSAD) | 16,398 | 30,437 | 42,079 | 54,884 |
| 19 | Edison, NJ (MSAD) | 13,565 | 28,994 | 43,682 | 58,267 |
| 20 | Greensboro-High Point, NC | 11,502 | 23,767 | 35,007 | 43,193 |
| 21 | Hartford-West Hartford-East Hartford, CT | 14,174 | 30,170 | 43,751 | 58,331 |
| 22 | Honolulu, HI | 18,028 | 32,934 | 48,877 | 58,075 |
| 23 | Houston-Baytown-Sugar Land, TX | 13,044 | 25,296 | 35,632 | 48,966 |
| 24 | Indianapolis, IN | 12,682 | 24,818 | 38,008 | 50,803 |
| 25 | Kansas City, MO-KS | 13,330 | 26,811 | 38,358 | 51,079 |
| 26 | Las Vegas-Paradise, NV | 13,386 | 24,249 | 36,449 | 45,550 |
| 27 | Los Angeles-Long Beach-Glendale, CA (MSAD) | 15,557 | 30,495 | 39,010 | 51,259 |
| 28 | Memphis, TN-MS-AR | 10,562 | 21,230 | 33,786 | 45,702 |
| 29 | Miami-Miami Beach-Kendall, FL (MSAD) | 13,882 | 25,528 | 33,861 | 43,806 |
| 30 | Milwaukee-Waukesha-West Allis, WI | 13,535 | 25,628 | 37,950 | 51,704 |
| 31 | Minneapolis-St. Paul-Bloomington, MN-WI | 14,278 | 30,316 | 44,095 | 60,850 |
| 32 | Nashville-Davidson-Murfreesboro, TN | 10,928 | 23,956 | 37,865 | 50,735 |
| 33 | Nassau-Suffolk, NY (MSAD) | 14,777 | 32,412 | 47,371 | 63,956 |
| 34 | New Haven-Milford, CT | 13,031 | 26,721 | 39,969 | 52,619 |
| 35 | New Orleans-Metairie-Kenner, LA | 10,646 | 21,508 | 31,039 | 42,436 |
| 36 | New York-Wayne-White Plains, NY-NJ (MSAD) | 14,431 | 28,931 | 44,500 | 58,089 |
| 37 | Newark-Union, NJ-PA (MSAD) | 14,033 | 29,674 | 46,179 | 62,368 |
| 38 | Oakland-Fremont-Hayward, CA (MSAD) | 16,808 | 35,419 | 49,453 | 69,572 |
| 39 | Omaha-Council Bluffs, NE-IA | 12,348 | 24,799 | 36,890 | 49,763 |
| 40 | Orlando, FL | 11,952 | 25,487 | 34,879 | 45,424 |
| 41 | Palm Bay-Melbourne-Titusville, FL | 11,749 | 26,020 | 34,342 | 46,202 |
| 42 | Philadelphia, PA (MSAD) | 12,905 | 26,191 | 39,556 | 54,912 |
| 43 | Phoenix-Mesa-Scottdale, AZ | 13,043 | 28,076 | 37,282 | 49,687 |
| 44 | Pittsburgh, PA | 10,817 | 20,513 | 31,133 | 42,510 |
| 45 | Portland-Vancouver-Beaverton, OR-WA | 13,652 | 25,445 | 39,004 | 49,016 |
| 46 | Providence-New Bedford-Fall River, RI-MA | 11,670 | 24,421 | 35,525 | 48,840 |
| 47 | Riverside-San Bernardino-Ontario, CA | 12,418 | 23,362 | 27,326 | 35,304 |
| 48 | Sacramento-Arden-Arcade-Roseville, CA | 14,720 | 28,213 | 38,884 | 51,115 |
| 49 | Salt Lake City, UT | 14,342 | 28,128 | 39,757 | 55,753 |
| 50 | San Antonio, TX | 10,829 | 23,301 | 32,755 | 42,888 |
| 51 | San Diego-Carlsbad-San Marcos, CA | 13,463 | 28,302 | 37,138 | 55,599 |
| 52 | San Francisco-San Mateo-Redwood City, CA (MSAD) | 14,935 | 31,065 | 45,828 | 68,087 |
| 53 | Santa Ana-Anaheim-Irvine, CA (MSAD) | 13,880 | 30,847 | 41,067 | 56,752 |
| 54 | Seattle-Bellevue-Everett, WA (MSAD) | 12,371 | 25,352 | 38,198 | 55,241 |
| 55 | St. Louis, MO-IL | 12,654 | 26,017 | 37,691 | 49,896 |
| 56 | Tampa-St. Petersburg-Clearwater, FL | 10,254 | 21,916 | 31,559 | 41,147 |
| 57 | Tucson, AZ | 11,368 | 22,988 | 31,236 | 40,970 |
| 58 | Virginia Beach-Norfolk-Newport News, VA-NC | 12,723 | 27,227 | 36,027 | 49,811 |
| 59 | Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD) | 15,855 | 32,675 | 47,985 | 67,820 |

Source: HSBC

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# Disclosure appendix

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