

**Lipper Fund *Industry* Insight Reports**



**Residential Real Estate  
Prices: Bubble, Froth, or  
the Real Thing**

by

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**RESIDENTIAL REAL ESTATE PRICES: BUBBLE, FROTH, OR THE REAL THING**

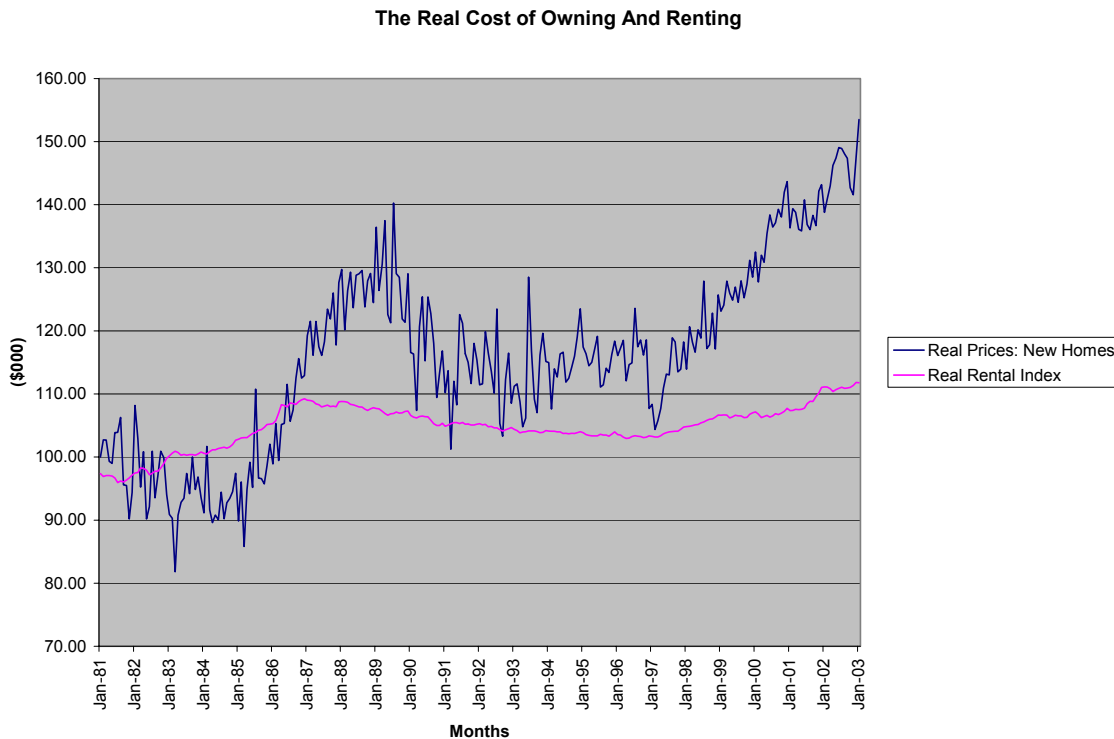
Home prices in the U.S. have risen substantially over the past 5 years. On an inflation adjusted basis, new home prices have risen about 32% nationally while existing home prices have risen more than 26% over the same time period.

However, rental income has not kept pace. Rental income, as measured by the Rental Price Index (a part of the CPI calculations each month), has risen 6.75% on an inflation adjusted basis.

This decoupling of home prices from rental income we view as signs of a bubble forming in home prices (think of the U.S. stock market from early 1995 to early 2000 when stock prices and dividends similarly decoupled).

Meanwhile, mortgage credit growth over the same period has risen 40% on an inflation adjusted basis, with revolving lines of credit growing 98% over the 5 year period and other real estate loans (primarily fixed rate lending) growing more than 35%. This rapid credit growth we also believe is a cause of the bubble or, as we mentioned earlier, a sign of some significant froth.

Here is a graph, similar to one published in a recent paper by Dean Baker (“The Run-Up in Home Prices: Is It Real or Is It a Bubble,” Center for Economic Policy and Research) that makes our point.



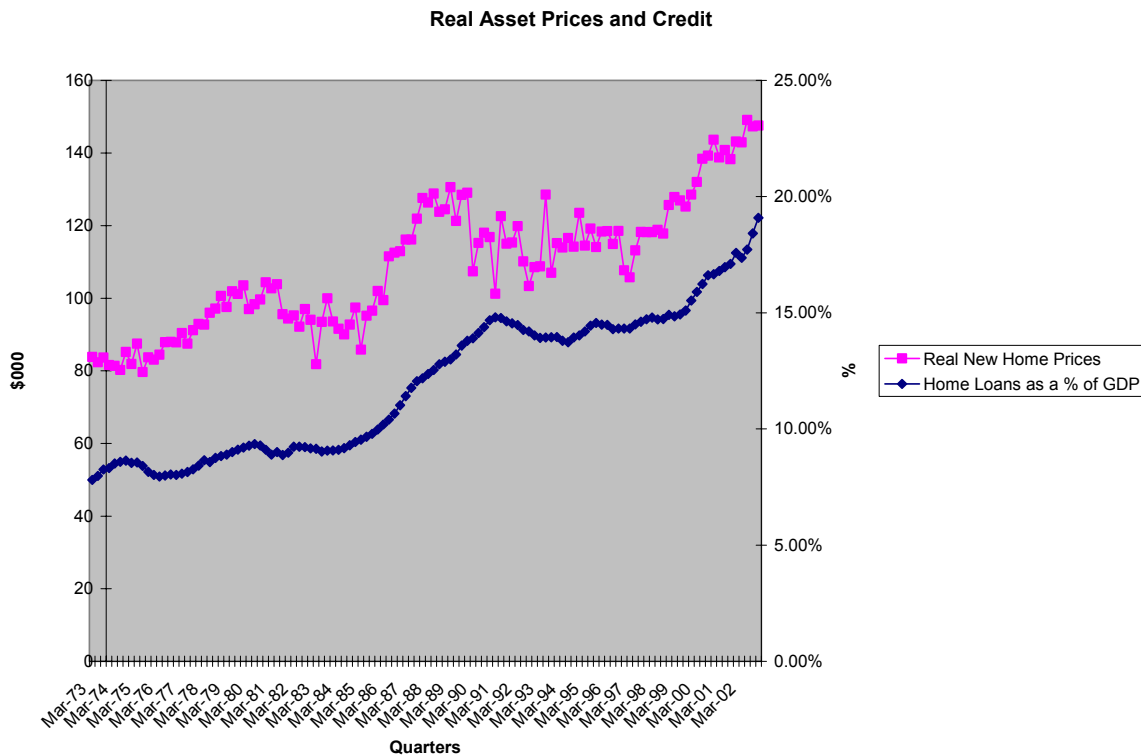
**Figure 1**

A similar graph for existing home prices and the rental index would show the same picture.

We draw the same conclusions from this graph as Dean Baker does. Two thirds of the run-up in home prices is attributable to a rise in the price of buying a home relative to the cost of renting a home. This would be expected if there were a housing bubble, since it suggests individuals and families are buying homes in a large part as an investment rather than primarily as a place to live.

By looking at the last run-up in housing prices that started in 1985 and reached its peak in the early 1990's, we see housing prices as prices rises away from the growth of rental income, only to collapse at in the early 1990's, as credit conditions tightened during the same time period and interest rates peaked.

We extend the graph above back to the early 1970's and include the ratio of total home lending (as defined by the Federal Reserve) to GDP to give a clearer picture on the influence of credit availability on home prices.



**Figure 2**

The two prior run-ups in home prices in the last 30 years (late 1970's to early 1980's and late 1980's to early 1990's) have a link to the availability of credit as well as to the well-documented demographics of the baby-boom cohort and the path of interest rates. A recent study by the Bank

for International Settlement (“Asset Prices, Financial and Monetary Stability: Exploring the Nexus,” BIS Working Paper No. 114) examines this question in some detail. The BIS paper will be used as our basis for making policy recommendations later but here we will quote from BIS relative to Figure 2:

From a practical perspective, the issue of interactions between various imbalances is particularly important. Rapid credit growth, by itself, may pose little threat to the stability of the financial system. The same could be said for rapid increases in asset prices or an investment boom. Rather, the historical narrative suggests that it is the *combination* of events, in particular, the simultaneous occurrence of rapid credit growth, rapid increase in asset prices and, in some cases, high levels of investment – rather than any one of these alone – that increases the likelihood of problems.

To make the link clearer between the ready availability of credit and the decoupling of home prices from rental income, we’ll make use of a new model developed in a series of recent papers by Lux and Sornette (“On Rational Bubbles and Fat Tails”), Sornette and Malevergne (“From Rational Bubbles to Crashes”) and Sornette (“Slimming of Power Law Tails by Increasing Market Returns” and “Stock Market Speculation”).

In these papers, the authors re-visit prior work on speculative bubbles and valuation formulas such as the classic Gordon and Shapiro or dividend discount model. In particular, they look at what happens when the risk-adjusted growth rate of a firm (or the price of housing) exceeds the discount rate. This is the case where a large price-to-dividend ratio expresses a large expected growth in future earnings such as was expected of “new economy” stocks and internet firms where there was the expectation of large future earnings though these stocks were paying little or no current dividends.

They note that the valuation problem has been posed as far back as 1938 by Von Neumann (“A Model of General Economic Equilibrium”) who demonstrated that, in an economy with balanced growth, the growth rate is always equal to the discount rate. As others have pointed out since Von Neumann’s paper, the implications of the growth rate and the discount rate being the same is an infinite price for the stock (the denominator in the dividend discount model goes to zero). The intuition behind this reasoning is that when the risk-adjusted growth rate becomes equal to or exceeds the discount rate, the price of money is not enough to stabilize the economy. Such a relationship encourages investors to borrow money to buy shares (or homes) and earn an effective rate of return, which is positive for all values of the dividend (or rental income). This is exactly what happened in the U.S. markets in the rally preceding the October 1929 crash and was the probable cause (or one of the causes) for many of the medium-term swings in asset prices shown in Graph 3 in the aforementioned BIS paper.

A negative difference between the discount rate and the risk-adjusted growth rate is similar to a negative real interest rate ( $r$ ) in the absence of growth and risks. It leads to an arbitrage opportunity since you can borrow \$1 now, keep it under your mattress, and give back  $\$1 \times (1 - r)$  at a later time and pocket  $100r$  cents in the process. It is exactly this process that links the decoupling of stock prices and dividends (or home prices and rental income) and the availability of credit.

Sornette proposes a general equilibrium model, which we'll summarize here that makes explicit the effect of the decoupling.

Basically, he treats the growth of the economy as reflected in the stock market as the accumulation of composite capital, plus a change on available technology that affects both old and new capital. Capital market values grow as people add new units of capital or as existing capital becomes more productive. In an equilibrium framework, the composite capital one period hence is equal to the current composite capital times its return less consumption. In the long run, consumption seems to grow at the same rate as wealth, income and other measures of available resources, so consumption is roughly proportional to composite capital with the constant of proportionality less than the return on capital (people tend to consume less than the expected return, leading to expected growth). In this framework, dividends are seen as depending on current and past prices rather than on prices depending on expected future dividends (as assumed in the dividend discount model). It is thus perfectly possible to model a market growing at an average rate  $r$  equal to the average of expected return on capital minus the constant of proportionality. In this framework,  $r$  can be greater than the discount rate or the rate of inflation.

We have tested Sornette and others assumptions on several of the major U.S. stock indices (the Dow Jones Industrials, S&P 500, NASDAQ 100 and the Wilshire 5000) and can confirm the value of their tools, especially mean-field theory, as a valid representation of what occurred to U.S. equity prices during the mid-1990's to early 2000. We have also tested Sornette's model for real estate prices, specifically, what happens when home prices begin to accelerate away from rental income and clearly see the growth in home prices becoming oscillatory with the amplitude swings increasing about 6 to 12 months before the crash. The 3 graphs below show these patterns for the run-up in prices during the 1970's, 1980's as well as the current run-up. These oscillatory patterns are the probable effect of purchasers' time horizons lengthening, i.e. the sentiment that the "run" will last indefinitely.

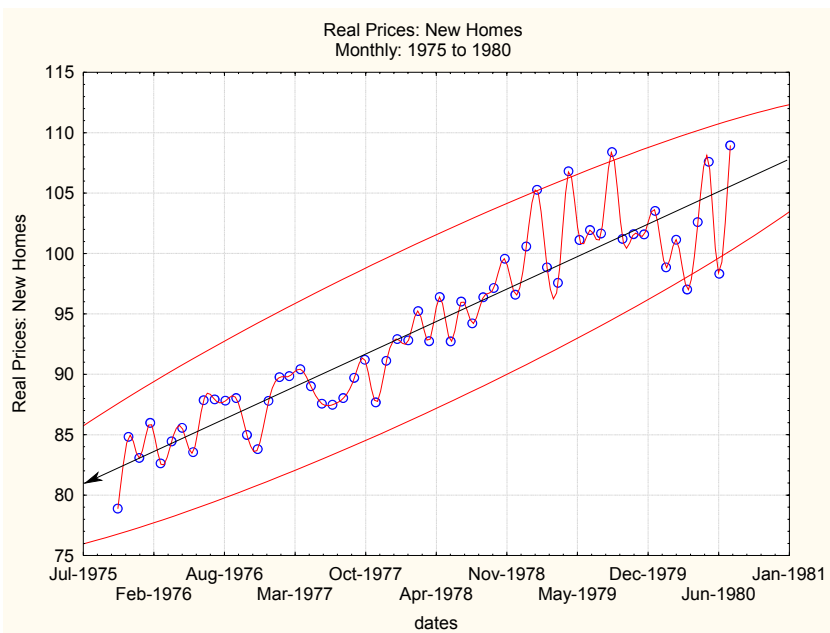
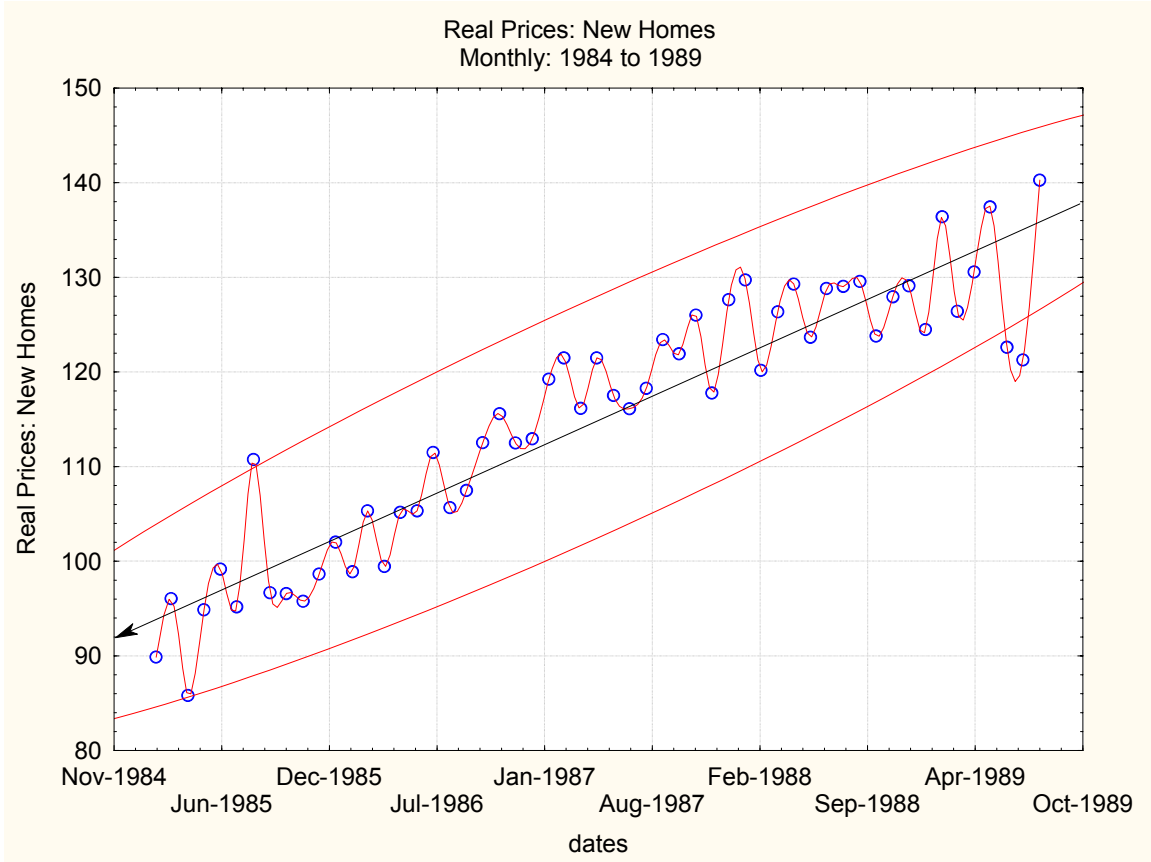


Figure 3



**Figure 4**



**Figure 5**

If we and others are correct and a housing bubble is in place, what size correction can we expect? Dean Baker says that a housing bubble would mean a correction in home prices of about 11% - 22% over time. We verified Baker's conjecture by examining Sornette's dynamical model for housing prices and found an "attractor" and "basins of attraction" for new home prices somewhere in the 10% - 20% range, i.e. if a correction in housing prices were to occur, this would be the range they would fall to. If our joint conjectures are correct, a fall in housing prices to these levels would destroy between \$1.3 trillion and \$2.6 trillion in housing wealth. Baker also estimates that residential construction would likely fall by 0.6 to 1.3 percentage points of GDP and consumption would drop by \$80 billion to \$160 billion dollars.

With these sort of effects hanging in the balance, we believe it is time for the Fed and bank regulators to review the growth in housing credit and the possible attendant bubble.

BIS makes it clear in its paper that financial imbalances can build up in an environment of low inflation. It also states that monetary policy that does not respond to these imbalances may unwittingly accommodate an unsustainable and disruptive boom in the real economy (though BIS does not say this, we feel this is what went on in the U.S. during the late 1990's). They go on to say, "The result need not take the form of inflation, though latent inflationary pressures may exist. Rather, it would be a contraction in economic activity, possibly accompanied by outright deflation and amplified widespread financial strains. Accordingly, one could argue that the more serious bubble was in the real economy."



Periods of financial imbalances and low inflation are not new. BIS lists several: CPI fell 10% from 1925 to 1930 in the U.S., 19<sup>th</sup> century U.S. banking crises often occurred in periods of low inflation, “Asian flu” occurred in countries with low and tending to decline inflation, while the current classic example is Japan where inflation was basically zero in 1986 – 1988 while stock prices tripled over the time period and commercial property prices climbed even more.

Monetary and regulatory responses can take on several flavors and we are sensitive of course to the political pressures such actions could evoke. However, if past is indeed prologue, it is time for the Fed and bank regulators to look closely at this issue.

**Andrew Clark, a senior research analyst at Lipper, wrote “Residential Real Estate Prices: Bubble, Froth, or Real Thing.” This is an updated version of a report that was originally released in August 2002. For comments or questions, please call 1-877-955-4773.**

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