

HISTORIC TURNING POINTS IN REAL ESTATE

By

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Abstract

This paper looks for markers of ends of real estate booms or busts. The changes in market psychology and related indicators that occurred at real estate market turning points in the United States since the 1980s are compared with changes at turning points in the more distant past. In all these episodes changes in an atmosphere of optimism about the future course of home prices, changes in public interpretation of the boom, as well as evidence of supply response to the high prices of a boom, are noted.

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Historic Turning Points in Real Estate¹

By Robert J. Shiller²

By some accounts, the greatest challenge for economic forecasters is to predict turning points. It is easy to extrapolate time series. It is less easy to tell when the series will abruptly change trend and enter a different pattern or regime.

Figure 1 shows a chart of US stock price and home price indices since 1987. It shows the Standard & Poor 500 Stock Price Index, a measure of the aggregate stock market, which has been the mostly widely used broad gauge of the market since the index was created in 1957. It also shows the Standard & Poor/Case-Shiller Composite Home Price Index, a ten-city average which is a measure of the aggregate market for single family homes, and is based on indices that Karl Case and I created in 1988. This index is now used for futures and options contracts at the Chicago Mercantile Exchange and for forward contracts in the over-the-counter market. Since the home price index is a three-month moving average, the S&P 500 is also plotted as a moving three-month moving average so that the two series are comparable.

The eye naturally picks out what appear to be major historic turning points. Looking at the chart, one sees that the stock market has shown abrupt changes in regime

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in early 2000, when it left a strong bull market, and went into rapid declines, and in late 2002 or early 2003, when it resumed a new strong upward climb.

The real estate market changed its direction markedly around 1990, from a booming market to a market in the doldrums for the better part of a decade, and then the market started accelerating upwards at increasing rates. The national home price boom since the late 1990s appears unprecedented in US history, although the “baby boom” in housing of the late 1940s and early 1950s comes close, and there have been some very large local booms. The rate of US housing appreciation slowed after 2005, and, to some eyes at least, it would appear just sometime after mid 2006, we are entering a new regime of downward price changes.

These, then are the natural questions for today: How shall we think about these major turning points of the past? Can study of these turning points offer to us any way to predict when the upward trend in the stock market? Is there any way to decide whether we really are entering a new regime of real estate market price declines?

Some people who think in terms of time-series analysis may disagree that such questions should even be asked. Prices observed in the stock market are widely described as random walks, if only approximately. If a time series is a true random walk, of a kind that may be generated by a random number generator, then it will be seen to have occasional major “turning points” that one could say have no other explanation than the chance arrival of a string of negative shocks after that point. Probability theorists can calculate the probability that the random walk will surpass the peak again, or calculate the improper spectral density of the random walk, but they would not seek to “explain” the turning point.

Of course, even if an economic time series is found to have the stochastic properties of a random walk, we could still “explain” the turning point by interpreting the sequence of shocks to the random walk that allow us afterwards to choose a point as the turning point. We might be able to tell a story about the causes of the sequence of negative shocks that came afterwards, which of course were really not generated by a random number generator but instead have interpretations in terms of various historical events. But, so long as the series is truly a random walk, the explanation would have to be entirely after the fact, and would offer no insights into the future forecasting of turning points.

Stock prices are not known to be exactly random walks. It has been demonstrated, for example, that stock prices have shown some momentum through time. Certain models very different from a random walk, involving such things as sudden regime changes, are not easy to reject statistically. There is a substantial econometric literature that documents deviations from random walk properties, and there is an econometric literature on the identification of regime change in time series. But stock prices are fairly close to random walks.

While stock prices somewhat resemble random walks, real estate prices certainly do not. There is, in fact, a very obvious smoothness to home prices historically, as can be seen from Figure 1. In fact, if one fits a quartic polynomial to the home price series shown in the figure one gets an R squared, as a measure of closeness of approximation, of 99.6%. Of course one should not use the fitted polynomial as a forecasting device, but the goodness of fit does illustrate the smoothness of the series, which no doubt has something to do with the difficulty that professionals and speculators have in reacting to new

information about the housing market. The housing market is populated mainly ordinary folk who do not react with the speed of professionals.

A polynomial has no unambiguous turning points. The point at which the slope changes from positive to negative or negative to positive may stand out to the eye on a plot of the polynomial, but the same point would not stand out on a plot of the slope of the derivative of the polynomial. Indeed, Figure 2, which shows the annualized rate of change of the same monthly series that appears in Figure 1 along with the National Association of Home Builders Index of Traffic of Prospective Buyers, gives a somewhat different impression where turning points might lie. There is of course seasonality, hard to detect on Figure 1, but which stands out as a powerful annual oscillation in Figure 2. Beyond that, it is clear that the housing market goes through long periods of either steadily increasing or steadily decreasing home price inflation, and that these periods have ended rather abruptly.

For example, it would appear that there was a major turning point in 2004 when home price increases peaked, and that corresponds roughly to a time when the traffic of home buyers also peaked, something that would probably stand out to home builders and real estate agents as the true turning point. The plot of increases in home prices in Figure 2 looks rather more (abstracting from seasonality) like a broken straight line composed of about three line segments. The rate of growth of home prices made abrupt changes in trend in 1991 and 2004. Because of the suddenness of the change in growth rates, these dates are only a couple years away from the breakpoints indicated by looking at the Levels chart, 1989 and 2006, in Figure 1.

The conventional forecast from business economists at this writing in mid 2007 seems to be that the market for homes in the United States shows signs of improving, and may have bottomed out. If that is the case then, judging from the perspective of Figure 2, these economists are claiming to have identified another major turning point, when the rate of increase of home prices will turn up again, after falling.

I want here to pursue the “why” of the apparent turning points, linking the apparent regime changes to economic events and to principles of behavioral economics. I will not be able to give a complete answer, as I will not be systematically pursuing all economic factors that might logically have an impact on home prices. On the other hand, in this paper I will concentrate on some apparently important psychological factors that are likely to be omitted completely in a rigorous econometric analysis of the real estate market.

The method here will be largely narrative, recounting the stories that people told about the market of the times. Economists are usually very careful to avoid entering such evidence. And yet, research by psychologists has found that narrative-based thinking is extremely important in human decision making. People’s thinking is often more influenced by human-interest stories than they are by quantitative evidence, see for example Schank and Abelson (1977,1995). Pursuing such an analysis may actually help us to forecast turning points, providing information that is hard to pursue with rigorous econometric analysis, or that may at least augment such econometric analysis by suggesting alternative models or suggesting priors for models.

Supply and Demand, Investor Optimism, and Uniqueness Bias

At the risk of repeating the obvious, but for the purpose of making sure the reader is online with some important facts, let us first reflect on those ubiquitous terms “supply” and “demand” that determine, by their intersection, prices in any market. The price has to clear the market continually. If there is an imbalance between supply and demand at any time, the price will have to change immediately.

It would seem that demand for housing services should be relatively inelastic in the short run, especially with regard to the number of units (rather than their size). Most families want just one house. The decision to own two or more houses, or the decision to break up the family to spread out over more houses, is not made very often—most commonly only at important life turning points or job changes. It is difficult for builders to transform two small housing units into one larger unit, or one large unit into two small housing units, without great costs. Hence, even small changes in the number of housing units might be expected to cause major short-run changes in home prices.

However, home prices do seem to show enormous momentum, and sudden changes in the market seem rare. In a speculative market, a sudden change in some component of supply or demand may produce little price change if people think that the change is temporary, and so another component, a speculative component, offsets the sudden change. But the speculative component is inherently psychological, potentially unstable, and subject to contagion and herd behavior. People may change their mind about whether a change in price is only temporary or is the beginning of a new trend. They are especially likely to change their mind because we have professional marketers

whose job is to get some kind of social response moving, and, when they do find some advertising pitch that resonates with investors, they will run it for all it is worth.

The supply of housing is dictated by the decisions of builders, who face markets for construction labor, materials and land prices. According to the simple “Tobin’s Q” model of investment, whenever home prices are high relative to construction costs, construction will proceed at a relatively high rate, until the gap between home prices and construction costs is closed off by new construction. If construction could be done instantaneously, it would not matter whether prices are rising or falling, builders would look only at the current price and build whenever price is high relative to construction costs. Since there are lags on the order of a year between decision to build and completion of a housing unit, builders will tend to pull back in a period of declining prices even if prices are high relative to construction costs, but will continue to build at a high rate if housing prices are still expected to be high by the time the construction can be completed.

Analysis of past booms seems to indicate that investors in both the stock market and the housing market seem often not to understand the supply response to price increases. These are normal intelligent people, why would they repeatedly make the same mistake again and again? There seems to be what I will call a uniqueness bias, a tendency for investors to overestimate how unique an investment they favor is, failing to take account of the inevitable supply response to high prices. The uniqueness bias is reflected in quite a number of anomalies of human judgment that psychologists have documented, including the “representativeness heuristic,” “overconfidence,” “wishful-thinking bias,” “spotlight effect” and “self-esteem bias.” The uniqueness bias is related to failure to

imagine how many possible competitors there are, a tendency to think highly of oneself and one's associates and an association of investments with one's sense of personal identity with an identified business model.

The uniqueness bias has its effect in the stock market by encouraging people to think that a company's market position is unique, and thus underestimating how quickly new competition will move in to close off any initial advantage. Gordon Philips and Gerard Hoberg, in their 2007 study of booms in individual stocks, found that those in competitive industries, not concentrated industries, show significant downturns following high valuations. For competitive industries, stock returns are low following high industry valuation and investment. They concluded that firms and the investors in these firms face a signal extraction problem in booms, not knowing whether other firms have the same apparent opportunities, not recognizing potential competition. They are thus vulnerable to "new era" booms, overinvesting while neglecting to consider that many others are, or soon will, be making essentially the same investments.

The uniqueness bias has its effect in the housing market when people imagine that the city they live in is unusually attractive, and increasingly so. They fail to understand that new such cities can be constructed in what are today cornfields or forests. In their 1990 paper, "The Baby Boom, The Baby Bust and the Housing Market," N. Gregory Mankiw and David Weil argued that the housing market would soon crash as the baby boomers retired, neglecting to consider how supply would adjust to any such change in demand. In their 2004 paper "Superstar Cities," Joseph Gyourko, Christopher Mayer and Todd Sinai argue for extrapolating some long-standing trends in major US cities, arguing

that these superstars will only grow in status, assuming implicitly that there can be no new supply of the services those cities provide.

We have seen many examples of such thinking in the history of economic thought. I wish to turn to some of these now, with special attention to the behavior of the markets around what later proved to be major turning points.

Analysis of Ends of Booms

The ends of booms seem to be associated both with surprises at the increase in supply of the underlying investment, and the negative effect of this increase in supply on price. I will give some information about the ends of the stock market boom of the 1990s, of the housing boom in Southern California in the 1880s, the end of the Florida land price boom of the 1920s, and the end of the US home price boom of the 1980s, before reflecting on the likely outlook after the recent boom in the housing market in the US.

The End in March 2000 of the Stock Market Boom of the 1990s

The end of the stock market boom of the 1990s, in 2000, coincides with the end of a 1990s boom in corporate earnings. Both the real S&P 500 Index and the real S&P 500 earnings peaked in 2000. Real monthly average stock prices (as measured by the S&P 500) fell 47% between the peak in August 2000 and the trough February 2003. Real S&P earnings fell 55% between the peak in September 2000 and the trough in March 2002. It would appear that earnings explain the timing of the peak in the stock market. It is certainly not quite right to conclude just this, however. In history, other major changes in corporate earnings have not had such massive effects on the stock market: something was

different in the 1990s that caused such an intense market reaction to earnings changes. And, of course, the earnings changes are not entirely exogenous to the stock market. The falling stock market after 2000 helped bring on the recession of 2001, which helped bring down earnings, and recessionary drops in earnings should not be reflected fully in stock prices.

The end of the “Internet” or “Dot Com” boom, and the intense media response to it, was part of the ambience at the end of the stock market boom of the 1990s. Jack Willoughby wrote a story in *Barron's*, the March 20, 2000 issue, entitled “Burning Up,” that argued that many Internet companies were rapidly running out of cash. The article included a ranking of Internet stocks by how many weeks left until they were out of money. The story provoked an intense reaction. Willoughby told me that he was astonished at the response he got to this article. It was an article put into a framework that attracted public attention, at just the right time, and was talked about incessantly. The story of a ranking stocks by the number of weeks they had left had word-of-mouth potential, and spread like wildfire.

Included in the story were examples of Internet companies underestimating the competition, imagining that they were unique because they had a clever idea to exploit the Internet, when in fact there were competitors waiting in the wings. Willoughby gave one example of such a story in that article:

“A good example is **eToys**, a toy retailer that came public at \$20 and surged to well over \$80 amid great public enthusiasm. The concept was easy to understand and promised great riches. But the competition, in the form of **Toys R Us**, did not roll over and play dead. Toys R Us launched its own Website, and ardor cooled for eToys. Today shares of eToys repose at 11¾. All those people who bought in at prices ranging from \$20 to \$80 are none too eager to buy more shares, even at \$12. EToys has enough cash on hand to last only 11 more months, so stay tuned.”

The story of eToys became a whopping embarrassment to those who had invested in it, for failing to see the elementary fact of supply response, of competition coming.

Indeed, an important factor that triggers the psychological end of a boom seems often to be stories in the news media about people who have made stupid mistakes. Such stories have word-of-mouth potential much more powerfully than stories about balance sheets or technical indicators. Even though the stories are of rather extreme and perhaps rare events, they are vivid stories that become connected in the public mind with the entire boom, and serve to embarrass promoters and buyers alike.

In terms of expressed optimism about the course of the stock market, there is no clear marker of the turning point. I have been compiling expectations data from both individual and institutional investors since 1989, and these data are now being compiled in the form of investor confidence indices under the auspices of the Yale School of Management. The “One-Year Confidence Index” is the percent of investors who say, in answer to one of the survey questions, that they think the stock market will go up in the next year. After the peak of the stock market in early 2000, the percent expressing confidence went up, rather than down. Of course, one might not expect to see drops in confidence at a time of newly lowered prices. The natural interpretation of these results is that prices fell until confidence that prices may rise was restored.

And yet the turning point in the stock market in 2000 does seem to be a time when people who thought that the stock market boom was a result of human foolishness were finally winning out and the jokes were starting to really hurt. In March of 2000, the

story of foolish investors was so strong that even the venerable *Consumer Reports* wrote dismissively of them:

“Whatever happened to the old idea that patience and a steady long-term perspective were the keys to investing success? They seem such quaint virtues during these days of go-go Internet stocks, gaga equity mutual funds sporting triple-digit returns, and up-to-the-minute bulletins on the Internet and Cable-TV financial-news channels.”

The intensity of the public reaction to the stories of human foolishness was augmented by a feeling that not only were people foolish, but also that in many cases they had been duped, they had been had. The many stories of accounting irregularities and fraud, leading to some heavily-covered trials of corporate executives, intensified these feelings.

There is a factor that Bohnet *et al.* call “betrayal aversion,” which they argue is actually stronger in many circumstances than pure risk aversion. People do not like to be betrayed, to be victims of others’ schemes. Because of the intensity of this betrayal aversion, the change in reaction is especially intense.

The end of the California Real Estate Boom of the 1880s

The California boom of the 1880s is very interesting to look at because it happened so long ago, over a century ago, is almost completely forgotten, and yet it bears striking similarities to the more recent real estate booms. There are no price index data for the boom, but the boom was actively covered in newspaper accounts all over the US at the time, accounts which are still available to allow us to trace out the course of the boom. This boom, as in other booms since, seems to have the form of neglecting to consider the supply response (new homes built) and the psychological market reaction.

The California boom, which took place in southern California, notably Los Angeles, over much of the 1880s until a peak in 1887, came to an end in the relatively mild recession of 1887-8. But, the dramatic collapse of real estate prices in California after the boom must have another explanation than just the recession.

One can still today read the advertisements for real estate of the time, preserved in old newspapers. In the early 1880s, the advertisements were relatively dignified and straightforward. As the decade moved on, the advertisements became more focused on the opportunities for rapid profits to be made in investing in southern California real estate.

A December 1887 advertisement for lots for homes in the *Los Angeles Times* said: “Phenomenal Success!” “Sales unprecedented in real estate records,” “This price will positively be advanced in a very few days.” Another ad in the same months said “Prices here will inevitably advance.”

Newspaper accounts of the foolishness of real estate investors in Southern California began well before the peak of the boom. In January 1887 the New York Times ran a story “Brisk Speculation in Old Los Angeles” which included the following:

“A gentleman with a roll in his hand enters a real estate office where an Eastern man is seated, and is introduced as Dr. Blank. The doctor is asked if he has sold that place of his? Yes, he has sold it. “I suppose you made something?” “Well, yes, I sold at an advance of \$4,000.” What was your original investment?” “\$1,500.” How long did you hold it?” “About three months, and I have more to sell now,” and he unrolls a diagram of streets and lots. The Eastern man is impressed by the remarkable advance—266 2/3 per centum in three months—and so well authenticated. One of the brokers then narrates his own conversion to belief in the firm foundation for present prices. Since 1881 the advance had been steady, with no reactions. Nobody complained of business except those who had sold before the last rapid advance, and were, metaphorically, ‘kicking’ themselves for not holding longer.”

As the boom unwound, in 1888 and 1889, newspaper articles became more insistent that the boom was a fiasco. Newspaper ads for real estate became more defensive, reacting to criticisms that lots had been sold for high prices in places that would not plausibly be developed in the foreseeable future. A May 1888 real estate ad included a map of the city around the site, asked the reader to study the map, and said “You will find it to be CLOSE INSIDE, with all the convenience and advantages of living in the city.” Another real estate ad in the *Los Angeles Times* in June 1888 said “Wildomar lots and lands are not a venture, but an investment in a well watered, well improved, thriving town, never boomed and never slumped.

As time went on, the number of ads for real estate in the *Los Angeles Times* fell dramatically, to be replaced by advertisements for bicycles, cigars, and other consumer items.

The End of the Florida Land Boom of the 1920s

It seems that the next major real estate boom in the United States, that achieved national attention, was the Florida land boom of the 1920s. Stories of appreciating properties in Florida began after the recession of 1920-1. Stories in early 1920s of people striking it rich in Florida land boom steamed right through 1923-4 recession. Newspaper articles started to appear frequently in early 1925, exposing schemes and doubting prices. The end of the boom has been attributed to the disastrous Florida hurricane, Sept 1926, and recession October 1926-September 1927. But, it seems, the true end of the boom is marked as well by indications of oversupply of new homes and of changes in investor psychology. In October 1925 the *Chicago Tribune* wrote:

“On the other hand, there are developments along the Dixie that will never be developed—sheer frauds. We’ve seen some of them, driving along the highway. One sometimes passes a pair of concrete pillars—the city’s gateway—and a lot of street posts stuck up along the pines, ten miles from anywhere, maybe in the heart of a turpentine grove with nothing in sight to warrant their ever being developed. The lots, however, have probably been sold, for the professional sharper can always land the suckers, whether it be in oil wells, bucketshops, silver mines, gold bricks, or the little pea and the three shells.”

The stories of a potentially endless supply of new lots, and of people being duped by operators had the same word-of-mouth resonance in the 1920s that it had in the 1880s, and once again the volume of real estate ads tapered off with the end of the boom.

The End of the U.S. Real Estate Boom of the 1980s

The late 1980s U.S. home buyers showed a high level of excitement and optimism. Karl Case and I collected homeowners’ expectations in 1988 for future home price changes in their city. We ask the question “On the average over the next ten years how much do you expect the value of your property to change each year?” Expected

price increases were very high, particularly in the boom cities. The surveys found also evidence of a high level of social contagion.

Residential investment rose during this boom, to a peak of 4.9% of GDP in 1987, and the new supply must have contributed to the end of the boom. The drop in home prices brought about a sharp decline in residential investment too, down to 3.4% of GDP in 1991.

The 1980s boom came early on the east coast than on the west coast. According to the Case-Shiller indices, Boston home price increases peaked in late 1985, while Los Angeles home price increases peaked in late 1988. However, the time of maximum price drops occurred simultaneously in the two cities, in the period ending early 1991.

As can be seen in Figure the end of the real estate boom of the 1980s was quite sudden, with a brief period of sharply falling prices in late 1990 and early 1991. The period of sharpest declines in home prices corresponds almost exactly to the Persian Gulf War. The threat of war began in mid 1990 when Saddam Hussein built up his troops near the border with Kuwait, suddenly occupied Kuwait, and challenged the US to respond, threatening dire consequences if it did. Saddam's men were reportedly dug in in Kuwait and had heavily mined the areas US troops would have to traverse, and so there was great concern about the possibility of heavy US losses. Saddam was also thought likely to launch terrorist actions against Americans around the world. The actual war began with the US invasion of Kuwait August 2, 1990. The war ended February 28, 1991. The biggest 12-month drop in home prices shown in the figure occurred in the 12-month period ending January 1991, with real prices falling a total of 12.9%. Traffic of prospective home buyers tumbled exactly parallel to this event. It is possible that the

psychology of this war, with the prospect of sharply affecting our daily lives, had an impact on people's mood for shopping and buying a new home.

The stock market confidence indices that I have been creating since 1989, now under the auspices of the Yale School of Management, show a sharp drop in "Buy-on-Dips Confidence" among institutional investors in late 1990 and early 1991, and recovery in late 1991. Buy-on-Dips Confidence is measured by asking respondents whether they think that sudden drops in the stock market are likely to be quickly reversed. The stock market (as measured by the Standard & Poor's 500 Index) fell 15% between June and October of 1990, and began a sharp recovery in February 1991, just as the Gulf War ended. Thus, it might appear that the Gulf War indeed had an effect on confidence.

There was also a U.S. recession, which began, according to the NBER dating, in the third quarter of 1990 and ended in the first quarter of 1991. It is hard to tell, of course, which event was the more important in producing home price decreases. The recession and the Gulf War were also not unrelated. The same effects that would bring on whatever psychology produced a sharp decline in the traffic of prospective home buyers would seem likely to contribute to a recession as well.

Other countries who were involved in the Gulf War with the US included Canada, the United Kingdom, and Australia. All of these countries saw drops in home prices at the time of the Gulf War. The sharpest drops in Canada were seen at almost the same time as in the U.S. The sharpest drop in UK home prices was a bit later, in late 1991 and 1992. The drops in Sydney home prices began in late 1989 and ended at the end of 1990.

The Real Estate Boom of the 2000s

The same factors that appeared to have been at work in the real estate booms discussed above appear to have been at work in the 2000s boom, a boom that shows signs of perhaps being near its end now in 2007. The same social contagion appears to have been at work. We have seen the same burgeoning of real estate advertisements.

So, has anything we have learned by studying the ends of real estate booms let us see more clearly whether the boom of the 2000s may be at end? Or, on the other hand, is there any evidence that we may be near a different kind of turning point, like that in 1990-91, when the period of declining growth rates of home prices abruptly ended?

We have seen during this boom a burgeoning of real estate investment. Residential investment as a share of GDP rose to 6.2% of GDP by early 2006, the highest level since 1950. Casual observation suggests that the “uniqueness bias” seems still to be at work. Most people do not seem to know that the supply of new homes is increasing so fast, and when I have talked to people at such times they instead seem to be focusing on stories of what will set their city apart. The phase of sense of betrayal and embarrassment for participating in the boom does not appear to have set in, at least yet.

The boom of the 2000s appears to be much bigger than any that preceded it. The California real estate boom of the 1880s, and the Florida boom of the 1920s, were the talk of the nation, but those booms did not materially spread to the rest of the nation. It seems that the 2000s boom has a different story behind it that allows broader contagion. The California boom of the 1880s and the Florida boom of the 1920s appear to have been driven, at least in part, by the story that people were then just discovering the beautiful climate of these exotic places. The story of the boom of the 2000s seems instead to have

been one of a growing world economy, producing greater affluence, a rising tide of new capitalists who may outbid ordinary people, who could be forever unable to afford a home. That story invites a boom that spreads everywhere—at least to any place in the world where there is a sense of uniqueness and not of abundance of undeveloped land.

In the 2000s, we have much more data to observe the real estate market, and at a time when there are lots of fears that the market may be slowing, we have people dissecting the data to look for clues on the future course. Unfortunately, much of the data have not been produced long, and we certainly do not have the data to allow us to compare it with the major real estate booms of the past.

The Michigan Consumer Sentiment Survey has for decades been including a question asking respondents whether they think it is a good time to buy a house. It would seem that answers to this question would inform us about investor optimism in the housing market. Unfortunately, judging from the answers to their follow-up question, which ask for factors that underlie their answer, it seems that most people think of interest rates when posed this question, not about changing expected rates of appreciation in the housing market. A good time to buy for them is a time when mortgage rates are low. The changes in interest rates are salient facts that come to their mind when asked whether this is a good time to buy, rather than changes in their expected appreciations of home prices which are not quantified in any publication that they can see.

Karl Case and I have updated our 1988 questionnaire survey results of recent homebuyers. We now have answers to this question for the years 2003, 2004, 2005, and 2006 as well. These data are consistent with a peak in expectations for home price increases around 2005, and signs of reduced expectations for price increase in 2006.

The most significant development in terms of new data on housing are the new futures markets for homes, begun in May 2006 by the Chicago Mercantile Exchange in connection with the firm MacroMarkets LLC, that I, along with Allan Weiss and Samuel Masucci, co-founded. Although this marketplace was preceded by spread betting firms in the United Kingdom, this is the world's first successful true futures market for home prices (following an unsuccessful attempt in 1991 at the London Futures and Options Exchange). Ten cities are traded, along with the composite index that appears in Figure 1. The contract mature on the last Tuesday of February, May, August and November, and are cash settled at 250 times the latest announced three-month-moving index, and the latest index is based on data available for home sales two months earlier, because of data reporting lags. The longest horizon futures contract at present is one year, but because of data lags, one could say that the longest horizon is really about eight months. Each index is based at 2000=100. Since the price of homes has more than doubled since 2000, the Standard & Poor Composite Home Price Index is over 200 and so the notional value of one contract is over \$50,000. As of January 2007, the latest value of the index (for the three months ending November 2006) was 223.58 and so the notional value was \$55,895. Total open interest in all eleven futures contracts was

The volume of trade in these markets has been small, but it appears to be growing now. Almost from the beginning of trading in these markets they have been predicting substantial declines in home prices over the succeeding year.

There are other indicators that suggest that there have been recent improvements in the US housing market. The number of US housing permits issued has dropped sharply in 2006 and 2007, but has increased, ever so slightly, in February 2007. The NAHB

Traffic of Prospective Buyers Index, which we saw in Figure 2, peaked in 2005, but while it is still low, has shown substantial improvement since. Prices of stocks of major home builders, which peaked in late 2005 and then fell sharply, have been going up since early 2006.

There are also examples of real estate markets in other countries that showed signs of falling prices, but have recovered since. In London, England, home prices, reversing a five percent home price decline from early 2004 to early 2005, have been rising since. Home prices in Sydney, Australia, started falling in 2003, and while they are still falling in that city, the rate of decline has tapered off, and there are sharply rising prices in Perth and other Australian cities.

Should we then infer that there is a *possibility* that the boom psychology of the 2000s housing boom in the United States will come back to revive the boom? There certainly is a possibility of that. No one seems to understand the social psychological processes that produce boom psychology.

But, one must remember that the high ratios of home prices relative to fundamentals, notably construction costs, have produced a supply response in housing that seems to be surprising people as it has always done in prior booms. There seems to be a chance that the element of surprise will turn into a downturn. We are already seeing this happen, with prices falling in most major cities in the United States.

Summarizing – What Marks Turning Points in Housing Booms?

We have looked at several different ends of booms—the end of the stock market boom of the 1990s, the end of the California real estate boom of the 1880s, the end of the

Florida land boom of the 1920s, the end of the national real estate boom of the 1980s, and the recent end (perhaps) of the national real estate boom of the 2000s. What seems to account for their abrupt ends?

We have looked at accounts of these events, at the narrative histories of these events. These accounts do not seem to show clear reasons for the somewhat abrupt ends of booms. In one case, the Florida land boom of the 1920s, an exogenous event, a hurricane appears to have played a role in the collapse after the boom. In another case again an exogenous event, the Persian Gulf War, appears likely to have been at least part of the reason for the abrupt change. In others, no exogenous event clearly marks the turning point. The causes of the turning point remain fuzzy.

And yet the change in reporting of these booms does indicate that a psychological element to these booms did matter. There were in some cases indications that people were “wising up” to abuse and betrayal of some who had exploited them during the boom, and it was starting to become embarrassing to admit that one was caught up in the boom.

These narrative accounts do not prove anything, and we do not know that the change in thinking that appears to accompany ends of booms was in any sense the cause of the end of the boom. The change in thinking cannot be measured accurately, as we have only media accounts that suggest at it, that represent some journalists’ impressions that may not be replicable. Some economists would therefore be inclined to exclude any such effects from the economic model of the boom, and to try to explain the change in terms of some more well-measured economic effects.

But, if one considers that the prices paid for houses, as for any other speculative investments, surely reflects people's willingness to pay, then the change in attitudes *must* have had an impact on prices. Just because we cannot precisely quantify and prove such an effect does not mean we should revert back to a null hypothesis that the changing psychology has no effect on home prices.

The best guess is that ends of housing booms have multiple causes, and cannot generally be interpreted as just an unraveling of boom psychology. Still a rising sense of enthusiasm and excitement for the investments, followed by a sense of betrayal and embarrassment at having fallen for the boom and underestimating the supply response to the boom, played a significant, if unquantifiable, role in the booms and their subsequent break.

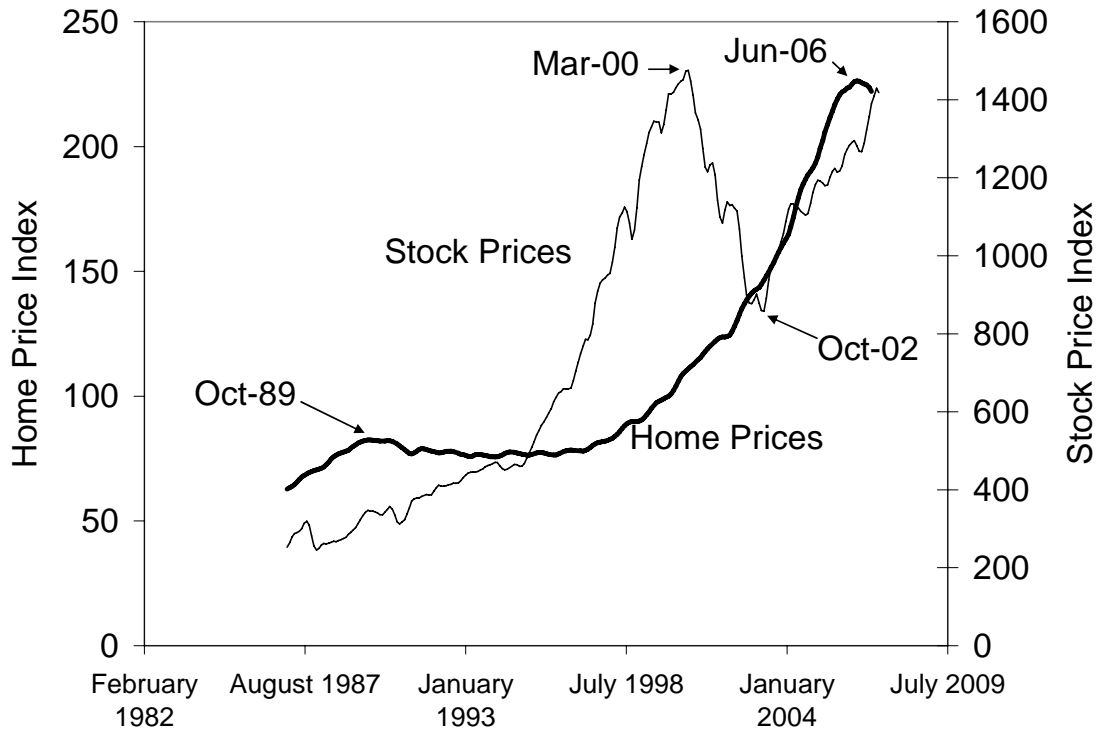


Figure 1. Prices in stock market and housing market, with dates of major turning points indicated. Standard and Poor 500 Stock Price Index (moving average of daily closing values for the three months ending with the month indicated, January 1987-March 2007) and Standard and Poor Composite Home Price Index, which is based on ten major U.S. cities, monthly, January 1987 to December 2006.

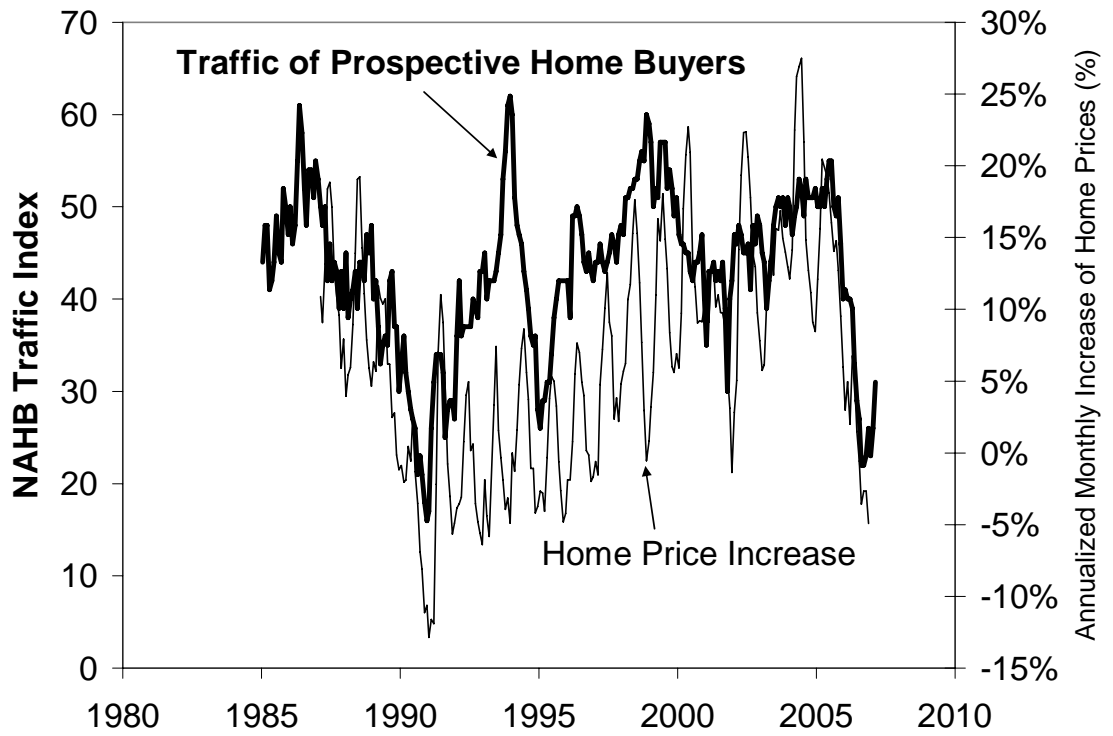


Figure 2. Month-to-month change in the Standard & Poor's/Case-Shiller Home Price Index, monthly, January 1987 to November 2006 along with National Association of Home Builders Housing Market Index, Traffic of Prospective Home Buyers, monthly January 1987 to January 2007.

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