

Bubble Trouble?

Your Home Has a P/E Ratio Too

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There is no housing shortage and don't expect a phantom shortage to prevent a bubble from being created.

I remember a realtor telling me some time ago that I should buy ocean front property because that was limited in supply and the price could only go up. The same kind of thinking has led many to conclude that, since California "needs" more housing, the current run-up in prices is justified by supply and demand, and there is no bubble here. For example, the *Los Angeles Times*, Monday, May 27, 2002, reported:



"With limited inventory and tightly controlled lending for new projects, the industry runs 'no risk of collapse' even if the economy stumbles, Economy.com analyst Steven Cochrane wrote in a recent report on the state."

Both these thoughts reflect a lack of understanding of how asset prices get determined. They reveal indifference to the behavior of rents, and/or they show a lack of understanding of the connection between the rents and the asset prices. This is the same error that Wall Street analysts made during the Internet Rush when they imagined that the New Economy changed the rules and created a fundamental disconnect between corporate earnings and stock prices. We know differently now. The markets are rudely reminding us that when we buy a stock (an asset), we are buying an earnings stream. The price we pay for

the stock should reflect current corporate earnings and reasonable expectations about what the future of earnings might be. A bubble is created when these get disconnected.

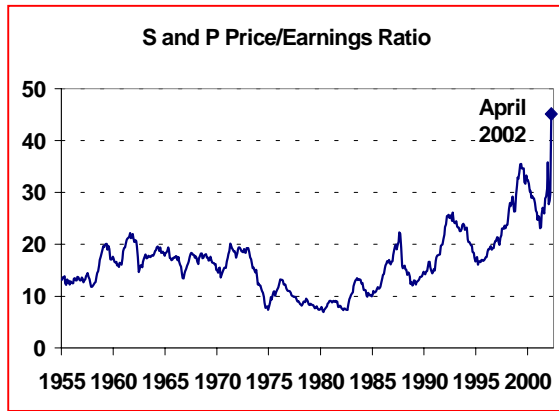
Survivor Investing can temporarily disconnect earnings and valuations

It is easy to lose track of the connection between earnings and valuations for stocks. Indeed, many investors play Survivor Investing: Outwit, Outlast, Outplay. To them, the value of the stock is what someone else will pay for it. It's the greater fool and the last man in who loses this game. Survivor investing is a zero-sum game, which can transfer a massive amount of wealth from losers to winners.

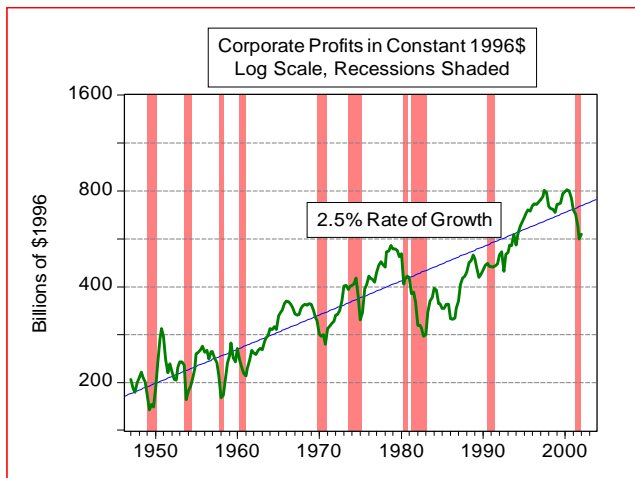
Survivor Investing requires a good story why prices can only go up.

When you are about to buy a piece of paper with no intrinsic value except that someone else will pay more for it, you definitely won't want to ask yourself what it is "really" worth. You need a compelling story why someone else will pay more for the paper, a story that will divert you from such devastating thoughts. In my lifetime, there has never been as good a story as the New Economy. This story allowed the most cockamamie business plans to attract billions of dollars of new investment and the story supported a whole new class of investments: all *p* and no *e*. Meanwhile, during the Internet Rush, the price/earnings ratio of the venerable S and P 500 reached for 40 times earnings when 20 had seemed high by historical standards.

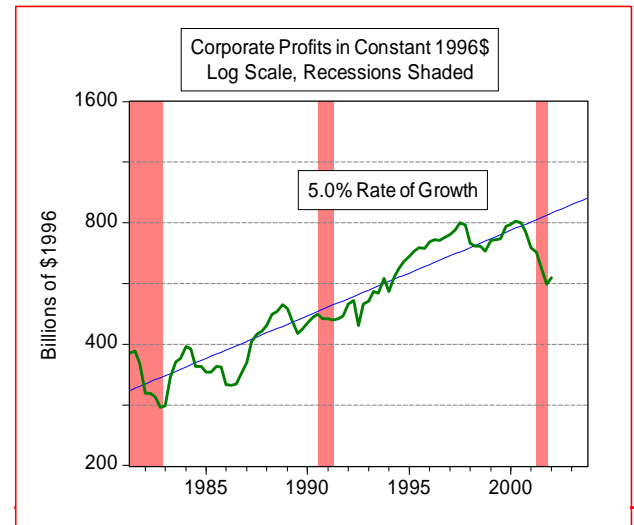
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Growth in corporate earnings is a good reason for a high p/e ratio, if that growth can be expected to persist. Corporate earnings before tax are displayed below in constant 1996\$ using a log scale which means that straight lines represent constant rates of growth. Over the corporate earnings curve I have placed a straight line representing 2.5% growth. The shaded regions are the US recessions, and, generally speaking, earnings have grown smartly during the expansions, have collapsed in the recessions, and have maintained a long-term rate of growth of 2.5%. But the recovery from the collapse of earnings in the double dip recession of the early 1980s was very very slow. Corporate earnings before tax in 1996\$ were \$537 billion in 1978 Q4 and did not return to that same level for fifteen years until 1993 Q2.



If your life as an investor didn't begin until 1980, you would see a very different picture – the one on the right – which suggests “normal” corporate earnings growth of 5%, not the 2.5% from the longer view. A much higher p/e ratio is easily justified with this kind of growth and the elevation of the S and P p/e ratio from 7.5 in 1982 to 24 in 1993 is fully supported by this “new” 5% growth in earnings. In this shorter view, with data only up to 1997, you would have seen earnings growth above trend from 1994 to 1997, and you might have come to think of this burst as a New Economy phenomenon, since you were reading so much about it in the financial press. You

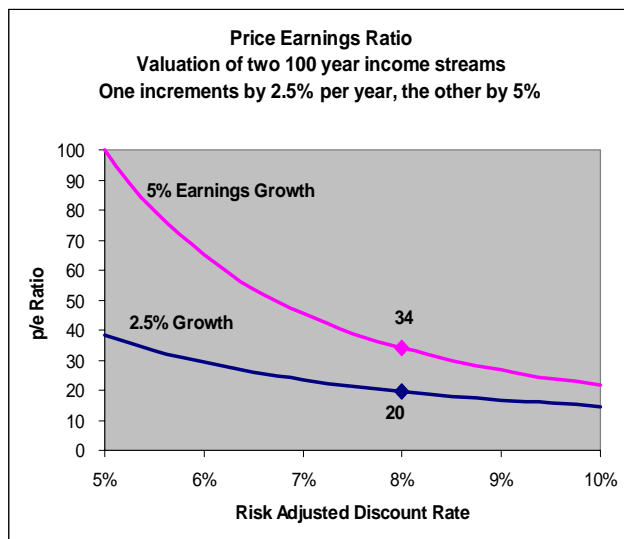


might have come to think of the “normal” growth of corporate earnings to be 7% or 10% or, when the New Economy really gets rolling, maybe 50%! Whooppee. Bid that p/e ratio up to 40.

Although corporate earnings stalled out at \$802b in 1997 Q3, the momentum of the New Economy story supported an 80% increase in the S and P 500 index from 824 in 1997 Q3 to 1475 in 2000 Q3. That's a bubble, unless these investors know something about future corporate earnings that is a complete mystery to me.

Fundamental valuation depends on the growth of earnings and the discount rate

Now a brief primer on fundamental valuation. The present value of a stream of future corporate earnings depends on the rate of growth of earnings and also on the risk adjusted discount rate that is used to translate uncertain future earnings into today's equivalent dollars. Below are p/e evaluation ratios for two different 100-year earnings streams. The higher value applies to the stream that has 5% earnings growth. The lower curve is the valuation of a stream with a 2.5% rate of growth. A p/e ratio of 20, such as the S and P had in the 60s applies to the 2.5% stream evaluated at an 8% rate of discount. At that same rate of discount, the 5% stream has a p/e ratio of 34, which is about what we had in the late 1990s. You can also get a 34 p/e ratio for the 2.5% stream if you use a lower rate of discount, about 5.5%.



Many academics are members of the “efficient markets” sect, which is premised on the idea that equity values are completely determined by fundamentals, not by Survivor Investors. Those elevated p/e ratios for equities in the late 1990s produced a debate among these academics: More earnings or a lower discount rate? Were globalization and the New

Economy increasing the long-term rate of growth of U.S. corporate earnings, or were investors using a lower discount rate because earnings are less risky and/or investors more risk tolerant? For these efficient market zealots, those are the only two options. But I think it was neither. It was Internet day traders and asset managers playing Survivor Investing.

A House Has a P/E Ratio, Too

You may not think about it when you buy a house, but it's the same thing. The price you pay should reflect the present value of future rent. You should go through the same mental calculation in purchasing a home as in purchasing a stock. Ask yourself how much the house could currently be rented for on an annual basis. Divide the seller's asking price by this rental number. That's the p/e ratio, the ratio of price to earnings. If a \$500,000 house could generate \$25,000 in annual rental earnings net of maintenance and management, then the p/e ratio is 20.

A high p/e ratio for housing can be justified because of the considerable tax advantages that are afforded to housing. A high p/e ratio can be justified if other assets are similarly high priced, for example, if bond yields and mortgage rates are low. A high p/e ratio can be justified in regions that can be expected to experience high growth and thus rapid appreciation in rental values, just like a tech stock can have a higher p/e than an automobile manufacturer. But you are completely deluding yourself if you think there can be a long-run disconnect between a house price and its potential rental stream. That's Survivor Investing.

I know it's hard to think this way. Unlike stocks, investments in homes do not come with quarterly earnings statements. Unlike stocks, the price of your home is not listed in the *Wall Street Journal* every day, which allows you to keep it on your books at whatever price suits your current mood. You are not the only one having a hard time with the difference

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between the asset price and the earnings stream. Even the Federal Government didn't want to do the right calculation when it computed the Consumer Price Index. Until 1983, the BLS took the asset price – the house price – as the price one pays for housing.

“Until the early 1980s, the CPI used what is called the asset price method to measure the change in the costs of owner-occupied housing. The asset price method treats the purchase of an asset, such as a house, as it does the purchase of any consumer good. Because the asset price method can lead to inappropriate results for goods that are purchased largely for investment reasons, the CPI implemented the rental equivalence approach to measuring price change for owner-occupied housing. It was implemented for the CPI-U in January 1983 and for the CPI for Urban Wage Earners and Clerical Workers (CPI-W) in January 1985.”

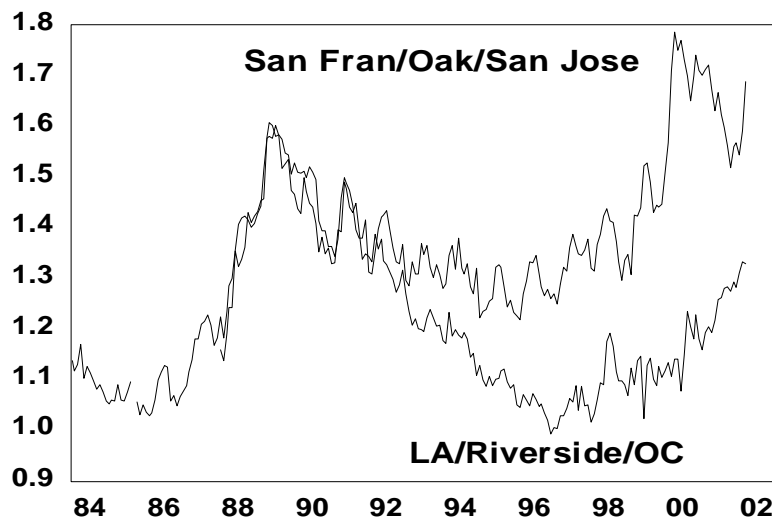
Bureau of Labor Statistics
<http://stats.bls.gov/cpi/cpifact6.htm>

The p/e ratio for Bay Area Homes Looks Pretty High

Thanks to the efforts of the Bureau of Labor Statistics, we can compute a price-earnings ratio for homes. A measure of “earnings” is the shelter component of the Consumer Price Index, which is computed for many major metropolitan areas including LA and the Bay Area. This isn't a perfect measure of earnings, since it is only an index that is arbitrarily set to one in 1996. It is also imperfect because it doesn't net out maintenance and management costs. Most of all, for owner-occupied homes this index is based on the owner's guesstimate of the rental value. Nonetheless, movement over time in this index is going to give us a pretty good idea of movement over time of “earnings” from homes.

For the asset price, we have to rely on the median price of homes sold in the area. This is imperfect also, since the quality of the median home that is sold varies over the cycle and tends to increase over time, while the government statisticians try to hold quality constant when they compute the CPI.

Price/Earnings Indexes for LA and SF Homes
Median Home Price / CPI Shelter



The New York Times

May 29, 2002

Bay Area Real Estate Prices Too Hot for Some to Touch

By MATT RICHEL

SARATOGA, Calif. — The ranch-style house, on a corner lot in this Silicon Valley suburb, was listed for sale at \$1.1 million. It was a fixer-upper that needed a lot of work, assuming it would not be torn down. But within three days the house had 18 offers, most from buyers eager to pay cash. It sold for \$1.45 million.

The sale sounds like something that took place two years ago, when the dot-com economy was soaring. But it occurred earlier this month, amid a regional downturn in which unemployment is up markedly and individual net worth has plunged in lock step with the Nasdaq stock market.

Nonetheless, even with all these caveats, the ratio of the median price of homes divided by the Shelter CPI displayed in the figure on the previous page is an extremely interesting number and has behaved very differently in LA and in San Francisco. Keep in mind that these are only indexes that do not allow us to compare in any given year the p/e ratio in San Francisco with the p/e ratio in LA. They only show us how the p/e ratio moves over time in each community. I have accordingly adjusted the levels to make the two numbers conform in the early 1990s.

In the late 1980s, in both communities, this p/e ratio increased by almost 60%. The California recession of the early 1990s sent the LA p/e ratio back to its 1985 low value. The rise in the LA p/e

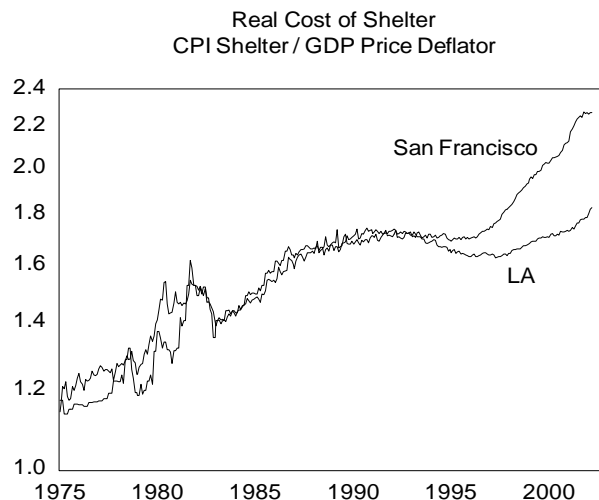
ratio since 1996 has been much more steady than the rise in the late 1980s and we are still well below the 1989 peak. All good news for LA.

But the Bay area is very different. Like the US stock market, the p/e ratio for San Francisco homes is at an all-time high. The decline after 1989 was much more modest in the North than the Southland, and it was back to its peak value by 1998, and from 1998 to 2000, the North p/e ratio simply skyrocketed. A brief decline in the median price of homes in 2001 lowered the p/e ratio but the market is off and running again in 2002 which has returned the p/e ratio virtually to its historic high.

What are they smoking up there?

Increases in rents may justify a high p/e ratio for housing, but maybe not

Some of the difference in p/e valuations in the North and the South may be due to differences in the rates of growth of “earnings.” The chart below displays the CPI of shelter divided by the US GDP deflator. The erratic behavior of this series prior to 1983 reflects the error made by the BEA – they used asset prices to measure the cost of shelter. Since 1983 we have rent values only and a much smoother



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picture. We see here that San Francisco and LA have shelter costs that move virtually in lock step until 1994 when San Francisco became considerably more expensive.

When a corporation experiences a burst in earnings, investors may bid up the asset price by a percentage that exceeds the increase in earnings and thus may reward the corporation with an elevated p/e ratio. This new p/e ratio could be based on the idea that corporate performance is a “permanent” condition. Exceptional growth predicts continued exceptional growth.

But be wary of this kind of thinking. An exceptional growth rate cannot last forever. Think about 10-year-old children. One child may experience exceptional growth making her much taller than her classmates, but if this difference in growth rates were to persist, the class would soon enough have one 50 foot tall student and while everyone else was around 5 feet. In other words, a stable distribution of heights or of corporate earnings, does not allow persistence in growth rates. Growth spurts occur. But not permanent differences in growth rates.

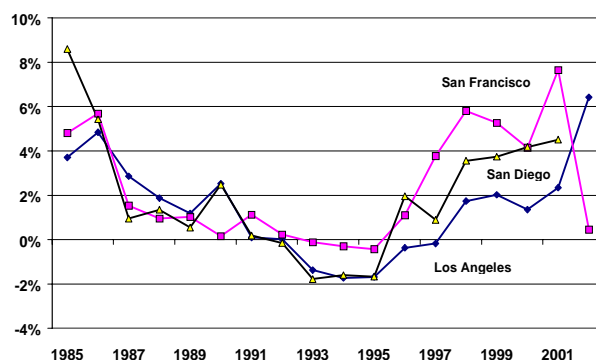
Likewise the relatively rapid appreciation of shelter costs in San Francisco after 1995 might be a good reason for an increase in the SF p/e ratio, if you think that there is “momentum” in rents – with high appreciation supporting further high appreciation. This might come from the imposition anti-growth of supply limitations, if demand continued to rise at the same pace

But, on the other hand, if you think that a region can price itself out of the competition for a workforce, then a period of sustained appreciation of rents (like the 1980s) precipitates a corrective reaction with labor and capital moving to places where rental costs are lower. Thus a period of rapid increases in rents may be followed by a period of stable or even declining rents. Indeed, after a sharp run-up in rents in the

late 1990s, San Francisco has experienced stable rents since mid-2001, while LA rents are growing more and more rapidly, as can be seen in the chart below. If we knew that this is likely to persist, with a sustained period of rent appreciation in LA but stable rents in San Francisco, then LA needs a high p/e ratio while San Francisco needs a low p/e ratio. Thus that stable SF e should come with falling p. Instead, what we have is stable e but rising p!

Bottom line: Bay area home buyers are placing a big bet on an early tech bounce back that will support rental increases similar to 1998 and 1999. That’s a risky bet. I hope they are otherwise diversified.

Annual Increase in Rents, \$1996



There is no such thing as a housing shortage

Now let’s get back to this shortage idea. There is no question that single family home starts have been weak in California during the 1990s as can be seen in the charts below. Multi-family starts have also been weak in the Southland but strong by historical standards in the North. So what, I ask? That’s not a “shortage,” at least not how I understand the term. A freely functioning market doesn’t have shortages. A market system has high prices for some goods and services and low prices for others. A “shortage” is created when the price mechanism is not allowed to

work. There can be a “shortage” of umbrellas in an LA rainstorm because sellers choose not to mark up the price to equilibrate supply and demand. Then the sellers run out of the goods, and you and I go without, even though we would have been willing to pay a handsome premium for an umbrella at just the right time. A shortage can portend a rise in price, if the basic supply and demand conditions that gave rise to the shortage persist, and if the market is allowed to equilibrate.

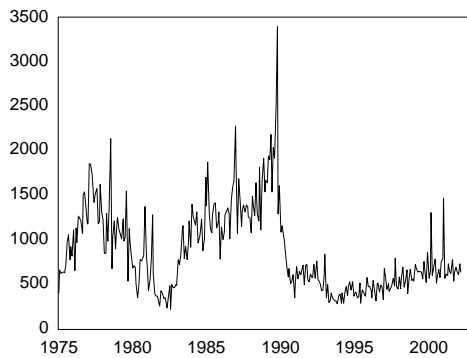
But both the rental and the asset market for dwellings are highly evolved and do not suffer from the fixed price pathologies that cause shortages. We

have high rents, or low rents, but no shortages. There is no “shortage” of dwellings any more than there is “shortage” of cars, or diamonds, or shirts.

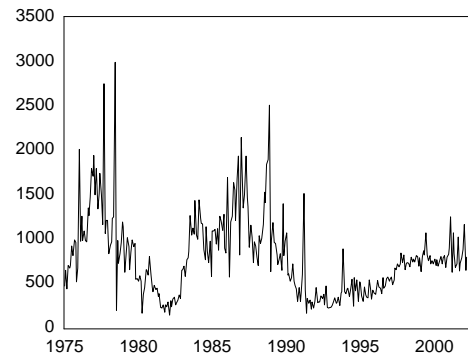
It’s not housing supply that is causing prices to escalate, it’s the recovery from the defense bust in the South and the Tech Boom in the North

Just as with stocks, the housing p/e ratio can vary because of changes in the fundamentals, but also can be greatly affected by “irrational exuberance” or “incapacitating ennui.” These psychological factors

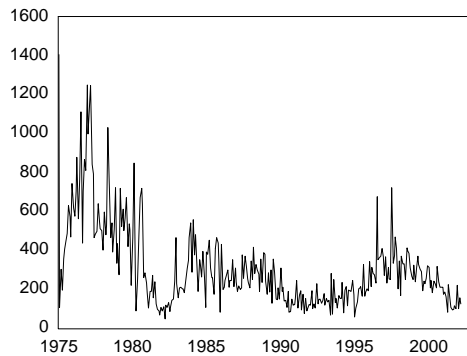
Single Family Housing Starts Seasonally Adjusted



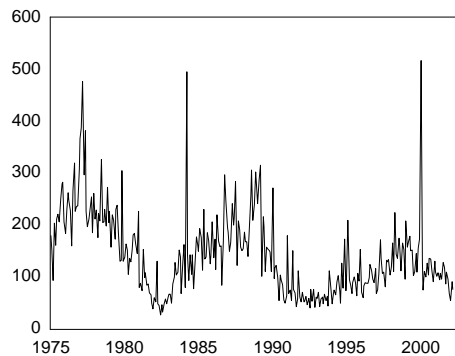
— Los Angeles



— San Diego

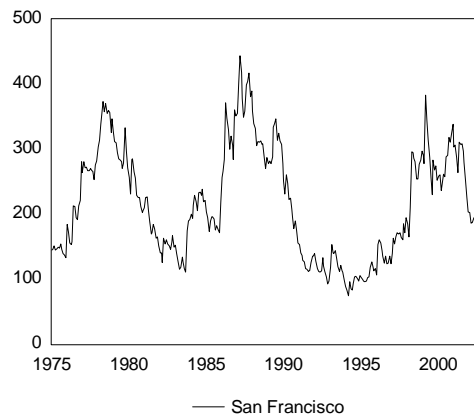
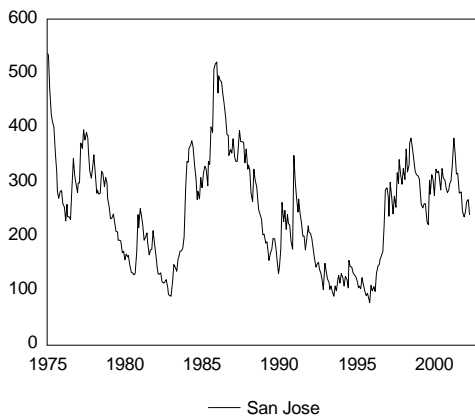
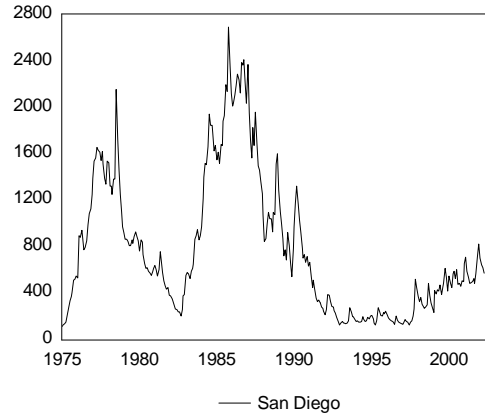
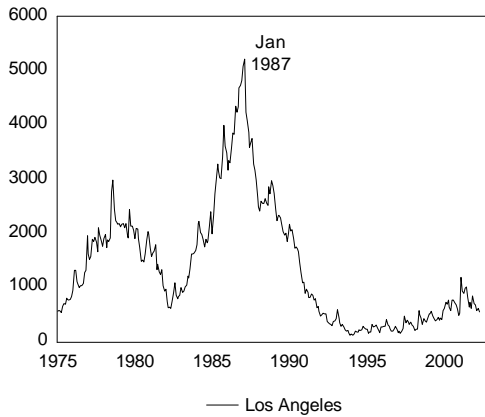


— San Jose



— San Francisco

Multi-family Housing Permits Seasonally Adjusted and Smoothed



can persist for very long periods of time in housing because most buyers and sellers are not connecting rental streams with asset prices. They are thinking like the realtor who told me prices of ocean front property can never go down and like Steven Cochrane of Economy.com who thinks that California prices overall cannot go down for the same reason: supply constraints. Let's think about these ideas like a fundamental investor would. It depends on what these growth limitations do to the path of rents, remembering that the price is the present value of future rents.

Limitations on new housing may cause rents to increase at an abnormally high rate for a period of time, but that higher rate of growth of rents should quickly be "capitalized" in the price of the asset, once the market realizes the impact of supply restrictions on future rents. That means a one-time jump in price, and, thereafter, price appreciation like every other asset – up sometimes, and down sometimes.

The supply limit on ocean front property was created in some earlier geologic age and should long ago have been capitalized in the price of ocean front

reality. Thus high prices for ocean front property, but no guarantee that the price can only go up. On the contrary, the rental price increase assumptions that determine the price premium for ocean front property may be much more uncertain than the future rental assumptions that apply elsewhere, and revisions to these ocean front fundamentals over time as more news arrives can cause large swings in the value of ocean front property, down as well as up.

Likewise, whatever effect the anti-growth forces may have had on California p/e ratios should have been absorbed by the market long ago, and is not a reason for continued appreciation of housing prices. Thus, when Steven Cochrane of Economy.com is reported by the *Los Angeles Times* to say “With limited inventory and tightly controlled lending for new projects, the industry runs ‘no risk of collapse’ even if the economy stumbles,” he is completely wrong. Even with absolute supply constraints, like the ocean front, asset prices can fall, and, if they do, that will surely be accompanied by a sharp drop in transactions and construction.

I think that what the California housing market has been struggling to value in the 1990s is not anti-growth government actions, but rather the uncertain persistence of the impact of the defense cutbacks in Southern California in the first half of the 1990s and the uncertain persistence of the impact of the New Economy tech boom on Northern California in the last half of the 1990s. The rise in the Southern p/e ratios comes from our ability, finally, to get beyond that difficult defense cutback. The stratospheric p/e ratios in the North require that the Tech effect on the North is very permanent.

But remember Survivor Investing requires a story. This story about ocean front property never falling in price is a good one, rivaling the New Economy story. The story that California anti-growth restrictions mean that housing cannot collapse is

another good one. If enough buyers and sellers think this way, then the market can validate this thinking for a long time. But in the longer run, there has to be a comeuppance. In the meantime, there are two investments I wouldn't be making: Pets.com.revival and overpriced real estate.

The California problem is not a housing shortage; it's income inequality

To continue along this provocative path, California's problem is not a scarcity of housing or even a scarcity of affordable housing. The problem is income inequality. We have workers who are essential to the economic well-being of the state who can hardly afford to live in decent dwellings, not to mention a pleasant little bungalow within an hour's drive of work. San Jose's solution to this problem has been to have its low-paid (\$100,000 a year or less) service workers live in far away inland communities and commute long distances every day to work. That worked when San Jose businesses could afford to pay premium wages to compensate their workers well enough that they would be willing to live this way, but this solution may not work for California as a whole, since we may price our workforce out of the competition with other states. That wasn't an issue in the Internet Rush, when companies were willing to bear any cost to benefit from the agglomerative externalities of Silicon Valley, but in the increasingly cost-conscious period ahead, more Northern California companies may be forced by competitive pressures to find locations out of the state where rents for dwellings are lower and workers more affordable.

What lies ahead? No burst yet.

House prices are of interest to you and me as home owners/buyers, but what matters for the economy is residential investment: new homes and improvements to existing homes. A collapse of this

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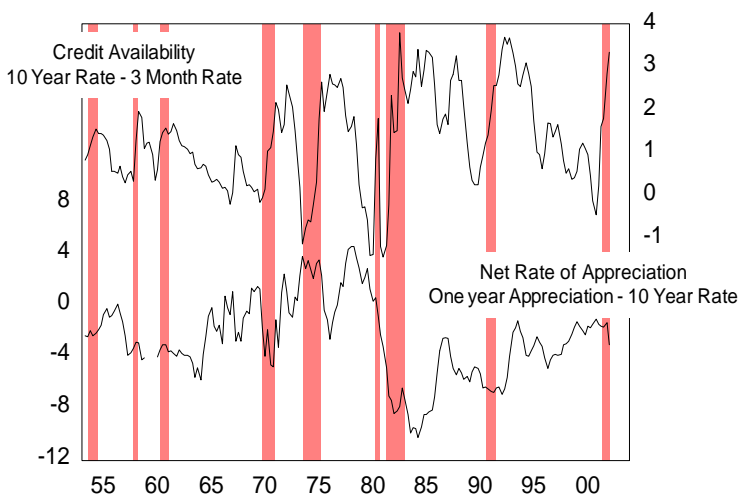
component of GDP has always led the way into recessions, has contributed directly about half of the GDP reduction, and more indirectly. This sector is absolutely critical in the next several years. Can it keep percolating along, or will we have a long overdue “consumer cycle” led by a collapse in residential investment?

A statistical analysis of the up and downs of housing identifies two key financial predictors of residential investment. One important predictor of housing investment is the difference between the interest rate on 10-year Treasury bonds and the annual appreciation on housing. This is a measure of the real cost of a mortgage. The other predictor is the spread between the rate on 10-year Treasuries and the 3-month Treasuries. This is a measure of credit availability. Banks make intermediation profits

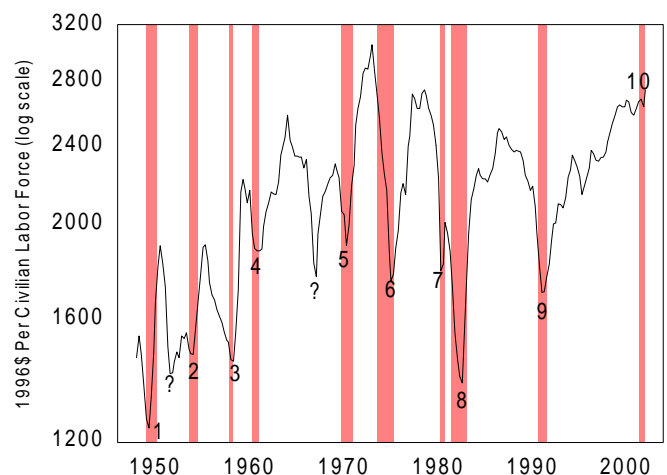
by taking short term deposits and transforming them into long term loans. When the yield curve is steep, that is when the long term rates are much higher than the short term rates, banks make automatic intermediation profits on every loan, but when the yield curve is flat, there are no intermediation profits and the activities of bankers shift from intermediation to the identification of risk. Banks then take a closer look at borrowers’ balance sheets and credit histories, and may insist on more collateral and a lower loan-to-value ratio. This makes it more difficult to “qualify” borrowers and squeezes many potential buyers out of the market.

These two housing market predictors are displayed in the figure below in a way such that up is good for housing and down is bad. Thus we have the slope of the yield curve (10-year rate minus 3-month

Housing is Weak When Credit is Scarce
and when Appreciation is Small



Real Per Capita Residential Investment



rate) and the appreciation minus the 10-year rate. The figure has the recessions shaded and the expansions unshaded. This figure reveals that the yield curve has been steep early in every expansion, and has always flattened or even inverted late in the expansion, precipitating the decline in housing. The net rate of appreciation was highest in the late 1970s which is when real per capita investment in housing was also at its peak. Weakness in housing appreciation in the 1980s and early 1990s contributed to a muted housing sector. Both of these measures were way down in 1980 when housing took a big tumble.

These two housing predictors can be combined into a single financial conditions index, with weights on the two components determined from the optimal

combined predictor: 80% on the spread and 20% on the appreciation rate. After standardizing to have mean zero and standard deviation one, we have the index displayed below. This offers a highly favorable view of what lies ahead for housing. The value of this index in 2002 Q2 is 1.8, virtually as high as it has ever been, almost two standard deviations above its mean.

Nationally, there is thus no bursting housing bubble in the immediate future. But this index could turn around rapidly if Mr. Greenspan decides to increase short-term interest rates. A flattening of the yield curve, rising mortgage rates, and weaker appreciation could all add up to a significant drop in housing. Stay tuned, I promise to keep you informed of any breaking developments in this regard.

