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## Why Identifying a Bubble Is So Much Trouble: John H. Cochrane

By John H. Cochrane - Sep 21, 2011

We seem to be surrounded by “bubbles” -- tech stocks, real estate, and now maybe sovereign debt.

You might expect that any textbook would have a precise definition of this phenomenon; some set of characteristics that distinguish sensible high prices in good times from prices that are “too high” or in a “bubble.” Alas, “bubbles” seem to be in the eye of the beholder.

Does that mean it’s all just empty talk? No, and there is solid academic research that helps us to think about what “bubbles” might mean, and how both policy makers and investors might think about them.

Here are the central facts: High valuations are, on average, followed by many years of poor returns, and vice versa. High valuations are not, on average, followed by years of good cash-flow growth, or by ever-higher valuations.

This fact holds across markets:

-- High stock price/dividend, price/earnings, or market/book ratios are on average followed by years of poor returns, not years of higher dividend and earnings growth, or permanently higher prices, and vice versa for low prices.

-- High yield spreads (low prices) on long-term bonds are on average followed by good returns on long-term bonds, not by increases in short-term [interest rates](#), and vice versa.

-- High credit spreads (low prices) on low-grade debt are followed, on average, by good returns on that debt, not a proportionally high bankruptcy rate, and vice versa.

-- High interest rates abroad relative to the U.S. are followed, on average, by good returns to U.S. investors in that debt, not by foreign exchange-rate depreciations, and vice versa.

-- High [house prices](#) relative to rents are followed, on average, by flat or declining house prices over many years, not by increases in rents, and vice versa.

No one substantially disputes these facts. The question is: What does all this tell us about why prices are high or low in the first place?

The facts don't support the theory that prices are high because people always expect a "greater fool" to pay a still higher price. If that were true, high prices would have no connection on average to subsequent returns or cash flows, and would correspond to forever higher prices. We just don't see that.

The [data](#) also deny the simple discounted cash-flow view. If investors think that dividends and earnings will grow strongly in the future, they will be willing to buy a stock for a large multiple of today's earnings. Although those bets won't turn out right every time, on average, high price ratios today will be followed by good growth in dividends or earnings. They aren't.

So what's going on?

## 'Macroeconomic Risk'

The "macroeconomic risk" view holds that the discount rate for a given cash flow can vary over time. Price booms come in good macroeconomic times, when the average investor is "searching for yield" and willing to take on some extra risk. Such investors bid up the price of unchanged cash flows.

Price busts come in horrible macroeconomic times, such as those we are enduring. In these periods, the average investor may rightly say, "I understand returns are better going forward, and there is the buying opportunity of a lifetime in [junk bonds](#). But I'm about to lose my house and my job, the bankers are about to shut down my business, and I can't take any extra risk right now." Such investors drive prices down until the same prospective cash flows can deliver returns large enough to overcome their justified fear.

## Over-Optimistic Investors

The "irrational" view is that investors' required returns don't change, but they simply get it wrong. Sometimes they get over-optimistic and bid up the price as if cash flows are going to be great. Sometimes they get irrationally depressed. In either case, they don't learn from the centuries of experience.

"Macro risk" researchers note the strong connection of prices to economic events, captured by explicit and rejectable economic theories of discount-rate variation; they complain about ex-post storytelling. The "irrational" camp points to puzzling surveys. For example, investors who bought Amazon.com at the height of the tech boom reported mathematically impossible cash-flow forecasts.

But surveys are easy to misinterpret: "Expect" and "risk" in casual conversation have very different meanings than "conditional mean and variance" in our models. And economics was meant to explain behavior, not self-perception. Rats in mazes do a good job of obeying the laws of economics, but they're not so good at responding to surveys.

## Financial Frictions

A new view says market swings are all about financial frictions, not mass risk aversion or psychology. In the financial crisis many assets seemed to fall in value because of the run in the shadow banking system,

or temporary illiquidity in markets. The question is whether this view can explain broad movements across many directly held assets like stocks, or whether it's confined to specific smaller markets.

A final view is tantalizing. Every "bubble" has also featured a "trading frenzy," from tulips in the 1600s to tech stocks in 1990 to condo-flipping in Miami in 2006. Perhaps traders hold high-priced assets despite low average returns because the assets are useful in helping them to profit from small bits of information, just as we hold money despite a low return because it's useful for buying things. If so, the rest of us should stay away from "bubble" assets.

Research has, at least, given a lot of structure to the "bubble" question. We know that variation in price ratios corresponds to discount-rate variation, not to changes in expected cash flows or the ability to find a greater fool. The challenge is to understand that discount-rate variation. A focused debate, based on clear facts and explicit theories, is real progress.

(John Cochrane is the AQR Capital Management Distinguished Service professor of finance at the University of Chicago Booth School of Business and a contributor to *Business Class*. A survey of much of the research mentioned in this essay is included in his recent article "[Discount Rates](#)," in the *Journal of Finance*. The opinions expressed are his own.)

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