



**Asset Price Bubbles:
Lessons and Policy Implications**

**August 15, 2014
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Thanks to Ben Pyle for research assistance and to FRBSF staff in Economic Research for helpful comments and suggestions.

Netherlands: Tulip Mania, Nov. 1636 to May 1637

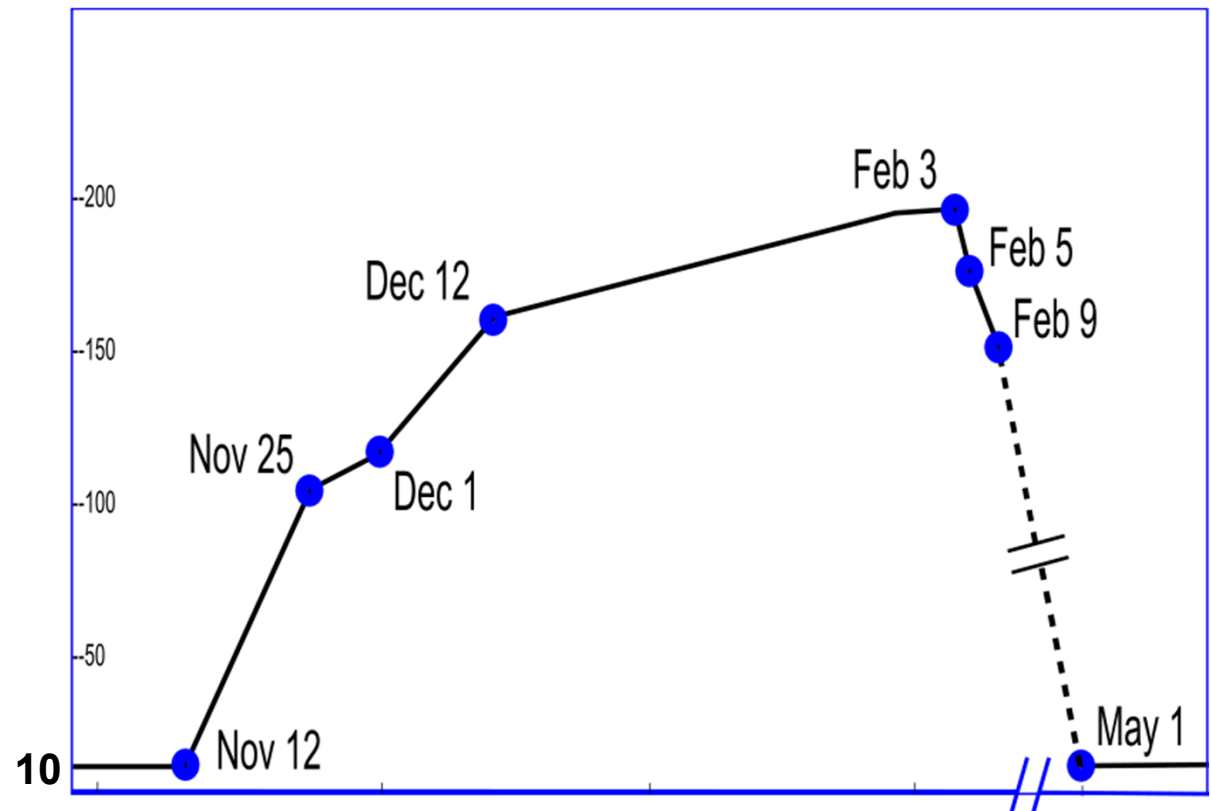


**Semper-Augustus
Tulip**

Source: Wikipedia

Futures Price For Delivery of One Tulip Bulb

Index = 10 on Nov 12, 1636



Source: E.A. Thompson (2007) "The Tulipmania: Fact or Artifact?"
Public Choice v. 130, pp. 99-114.

What is a Bubble?

Bubble (def.): An asset price that has risen (significantly) above its “fundamental value,” as measured by the discounted stream of expected future cash flows that will accrue to the owner of the asset.



Outline

History

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What Explains Bubbles?

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- Social dynamics and human emotion.
- Market structure (short-selling is risky and costly).

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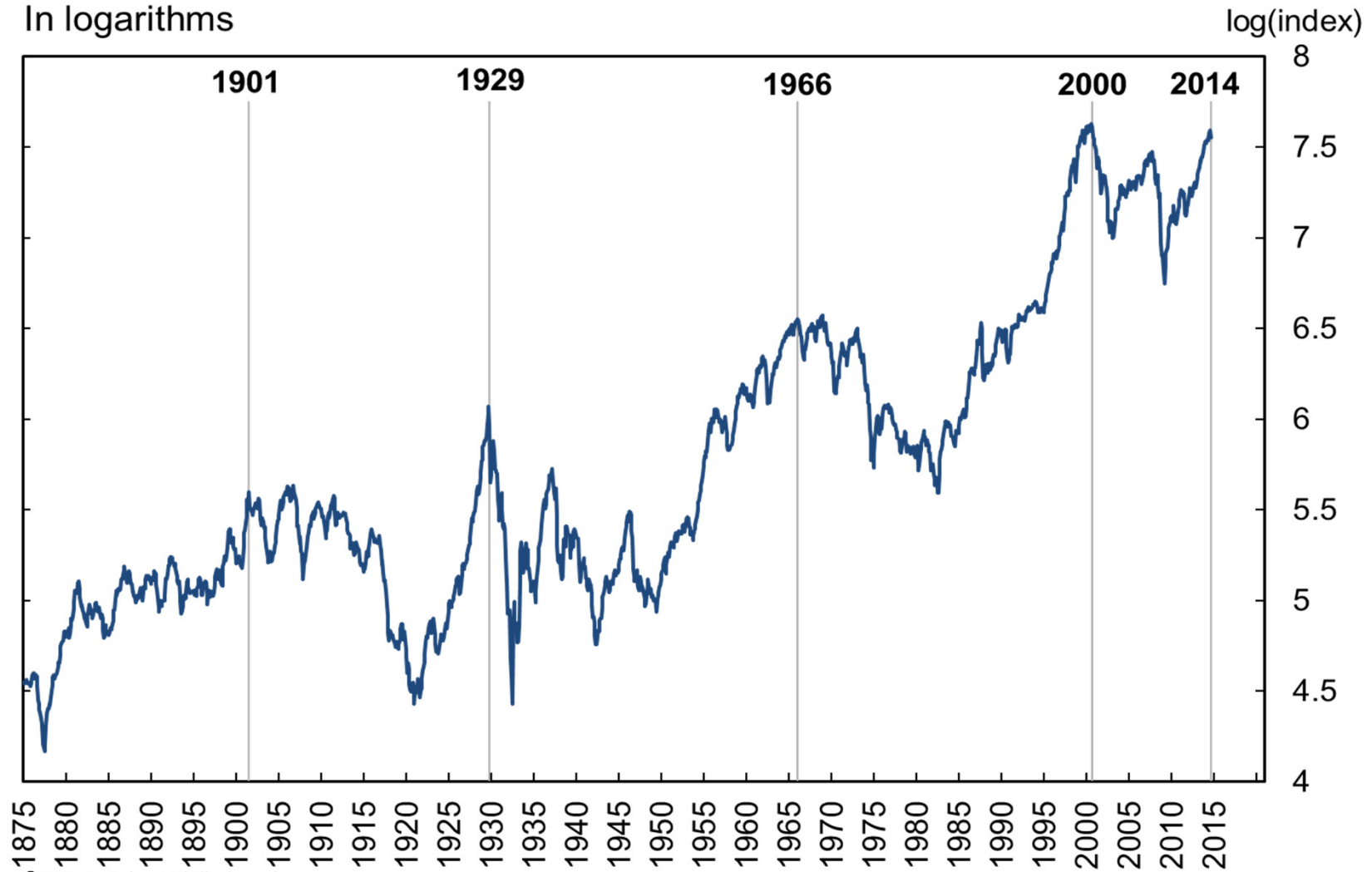
Policy Implications

- Economic consequences of bubbles.
- Pre-crisis view on dealing with bubbles.
- Post-crisis view on dealing with bubbles.

Four (or Five) Major Run-ups in U.S. Stock Prices

Real S&P 500 Index

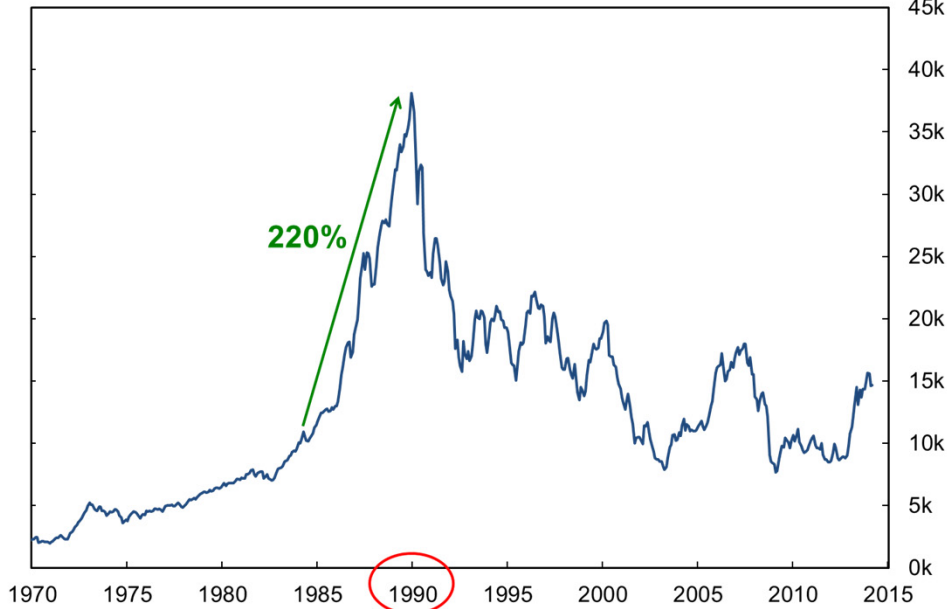
In logarithms



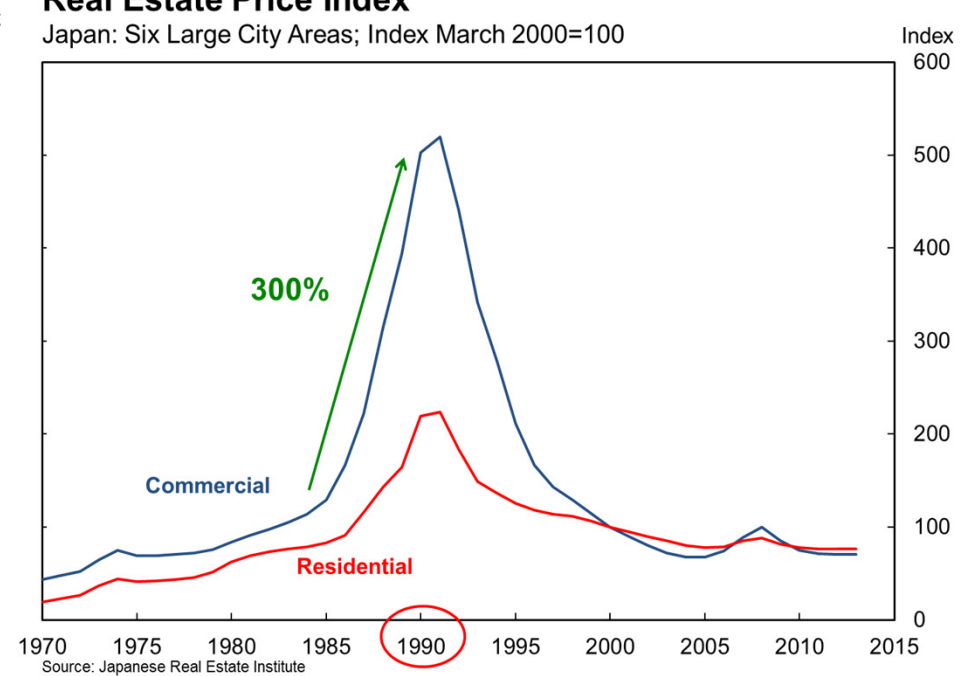
Source: Robert Shiller's website

Japan: Twin Bubbles in Stocks and Real Estate, 1985 to 1990

Nikkei 225
Monthly Average



Real Estate Price Index
Japan: Six Large City Areas; Index March 2000=100



Bitcoin Digital Currency

September 2013 to December 2013

Bitcoin

BitStamp Exchange



What Explains Bubbles?

I. **Forecasts Based on Past Price Movements**

- Upward price motion begets expectations of further upward motion.
- Rise in prices fuels optimism, drawing in new investors.
- New investors bid up prices further, often using borrowed money.

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II. **Social Dynamics and Human Emotion**

- Bubbles are “fads” or “infectious beliefs” that spread like epidemics through personal interactions and the media.
- Episodes typically involve a story about new technology or a “new era.”
- Human emotion (fear of missing out) is a powerful driving force.

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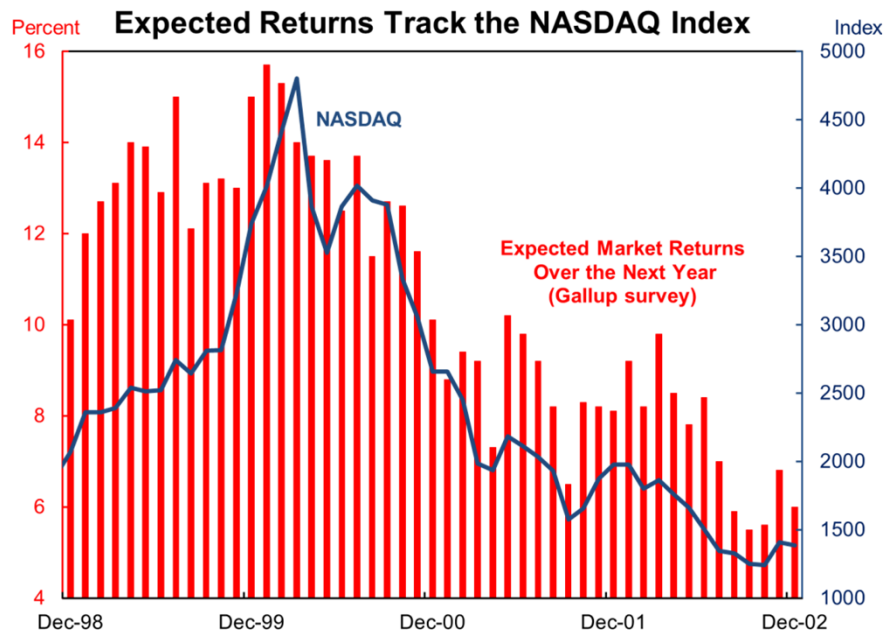
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III. **Market Structure**

- Market consists of both optimistic and pessimistic investors.
- Pessimistic investors must engage in risky and costly short-selling to express their views.
- Optimistic investors can therefore dominate the price action.

Investor Forecasts Track Recent Price Action

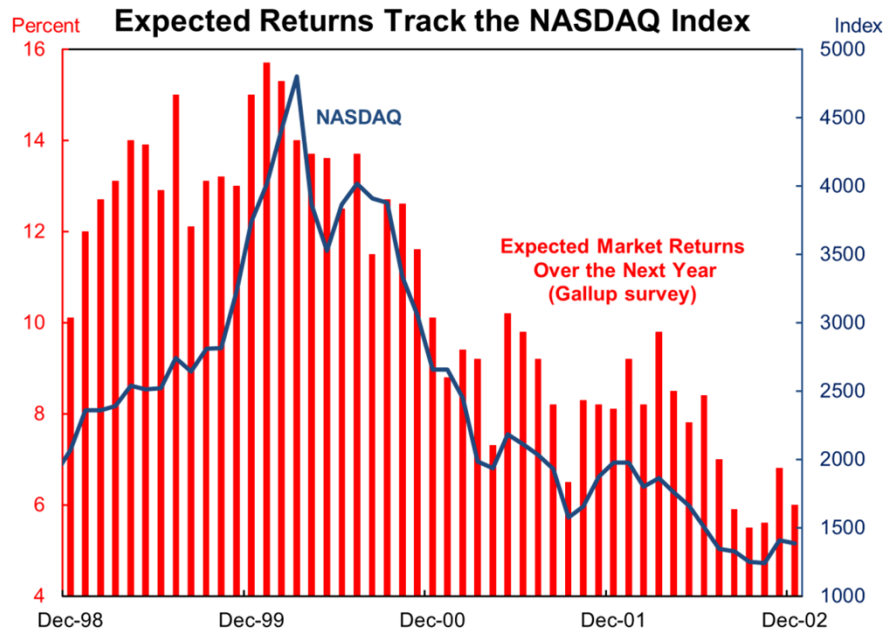
Detecting a bubble: Investors become more optimistic about future asset returns as prices go higher.



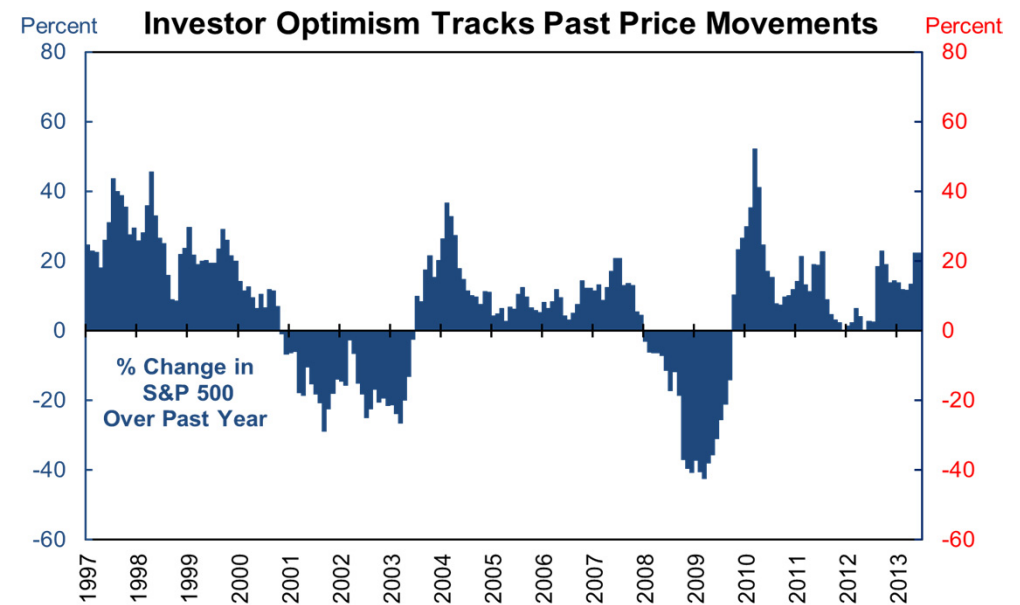
Source: A. Vissing Jorgensen (2004). "Perspectives on Behavioral Finance: Does Irrationality Disappear with Wealth" in NBER Macro Annual 2003, MIT Press, pp. 139-194.

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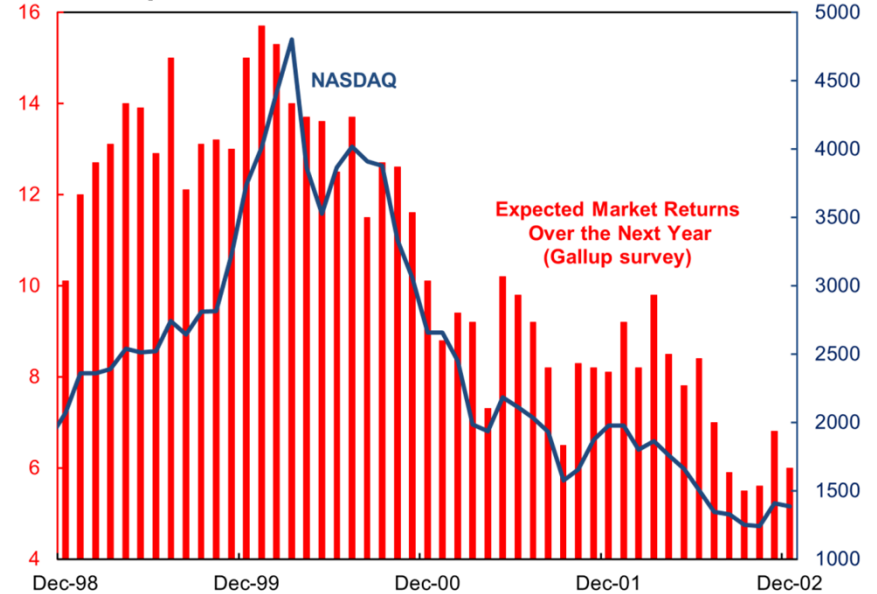


Source: R. Greenwood and A. Shliefer (2013). "Expectations of Returns and Expected Returns," NBER Working Paper 18686.

Investor Forecasts Track Recent Price Action

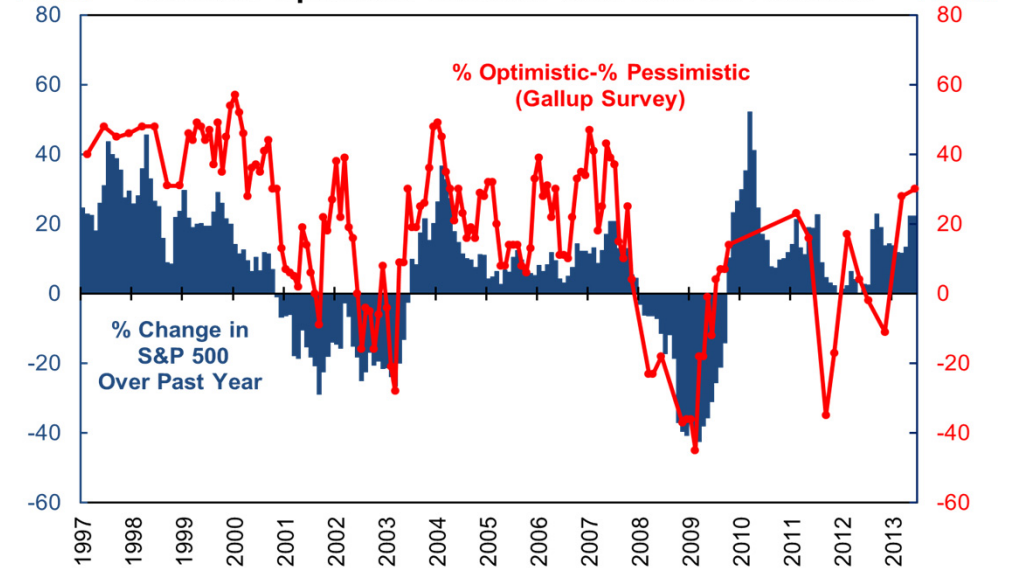
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Percent **Expected Returns Track the NASDAQ Index**



Source: A. Vissing Jorgensen (2004). "Perspectives on Behavioral Finance: Does Irrationality Disappear with Wealth" in NBER Macro Annual 2003, MIT Press, pp. 139-194.

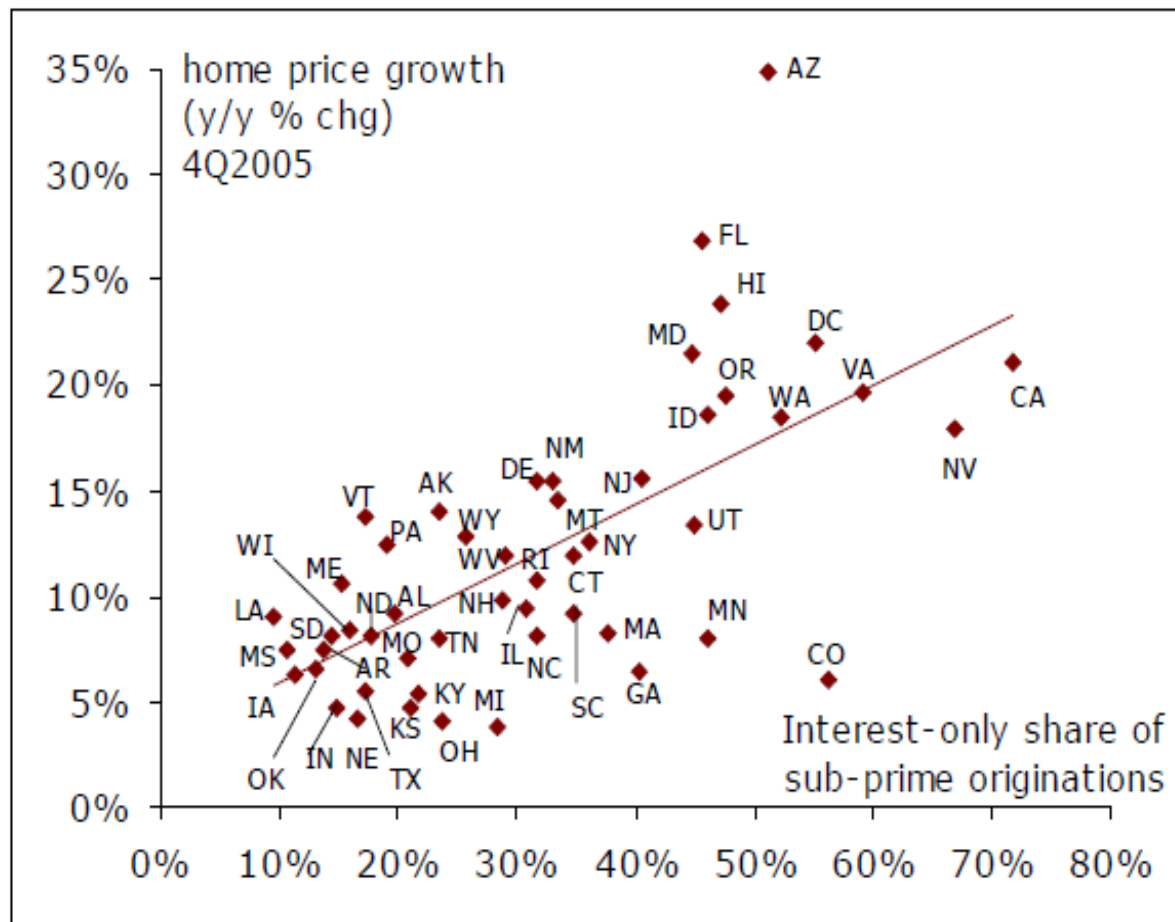
Percent **Investor Optimism Tracks Past Price Movements** Percent



Source: R. Greenwood and A. Shliefer (2013). "Expectations of Returns and Expected Returns," NBER Working Paper 18686.

Investors Bid Up Prices Using Borrowed Money

House prices rose faster where exotic mortgages were more prevalent.

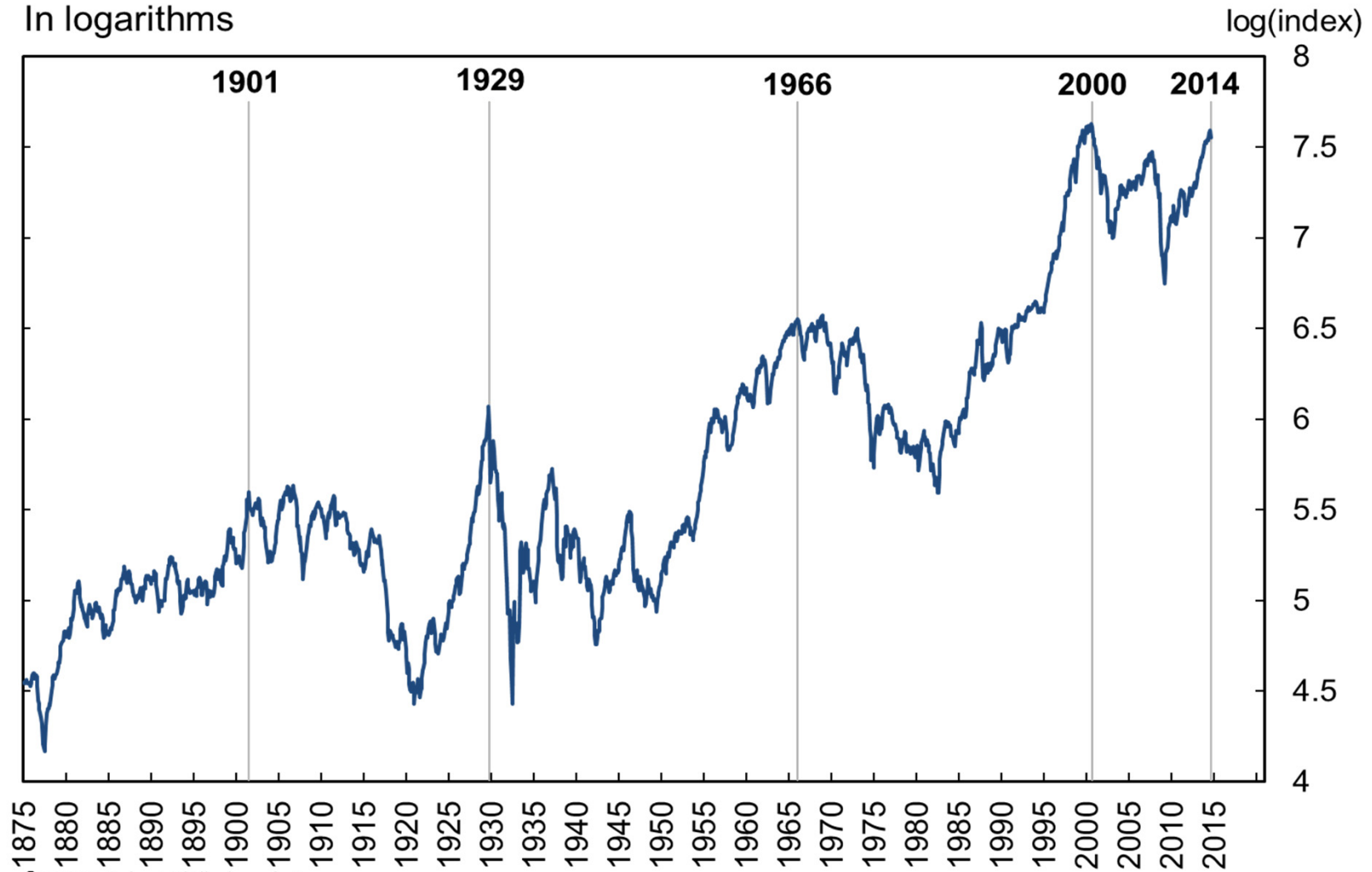


Source: B. Tal (2006). "How Painful Will Mortgage Resets Be?" CIBC World Markets, Inc. *Consumer Watch* U.S., (October 18).

Four (or Five) Major Run-ups in U.S. Stock Prices

Real S&P 500 Index

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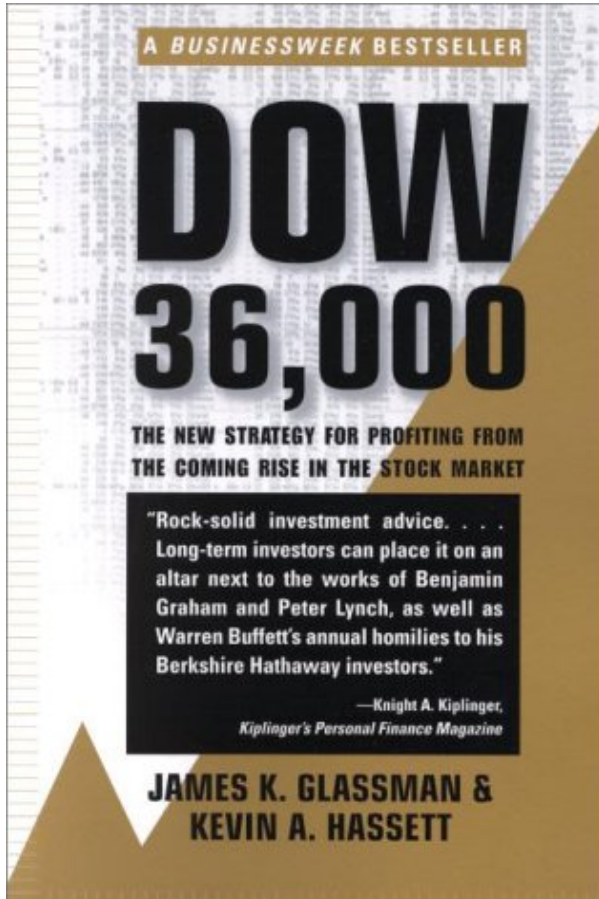


Source: Robert Shiller's website

Price Run-ups and “New Era Enthusiasm”

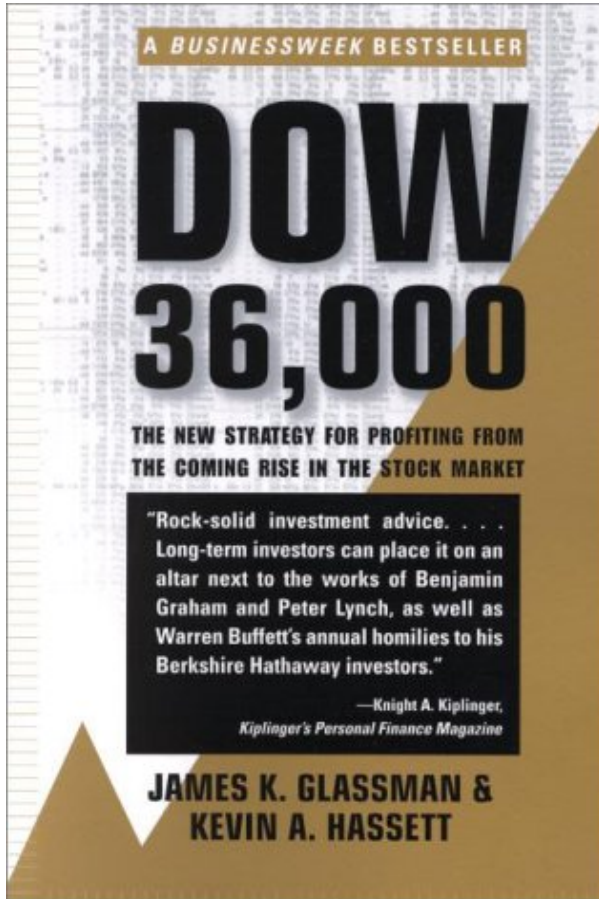
- Early 1900s: High-speed rail travel, transatlantic radio, long-line electrical transmission.
- 1920s: Mass-production of autos, travel by highways and roads, commercial radio broadcasts, widespread electrification of manufacturing.
- 1950s and 60s: Widespread introduction of television, advent of the suburban lifestyle, space travel.
- Late 1990s: Widespread availability of the internet, innovations in information and communication technology, introduction of web-based business model.
- 2009-2014: Social networks, electric cars, digital currency, wearable technology.

Fear of Missing Out Draws in New Investors

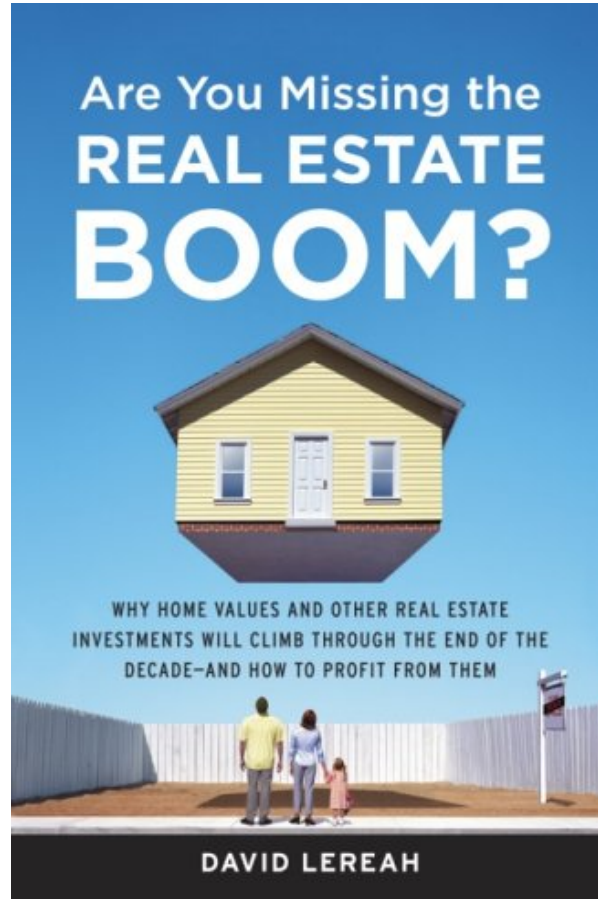


September 1999

Fear of Missing Out Draws in New Investors

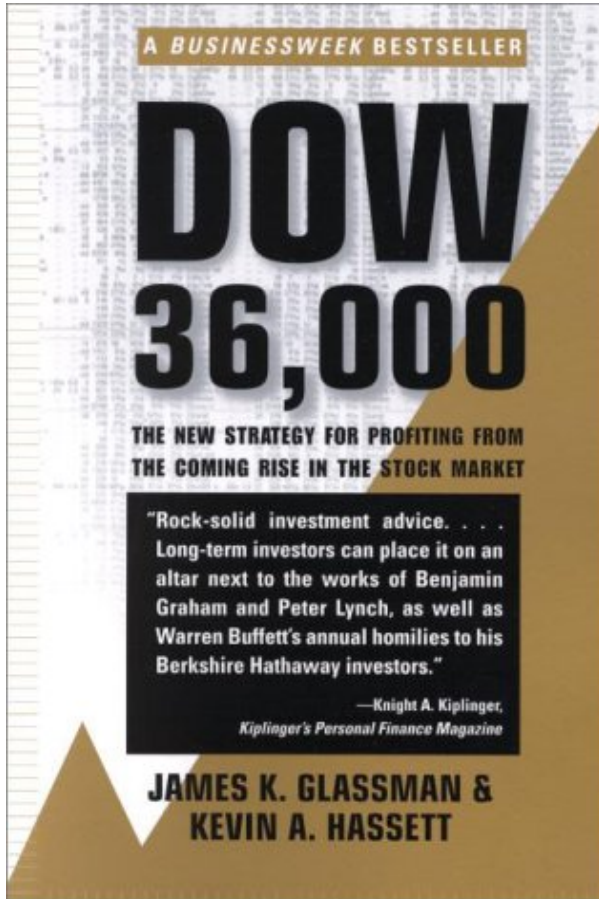


September 1999

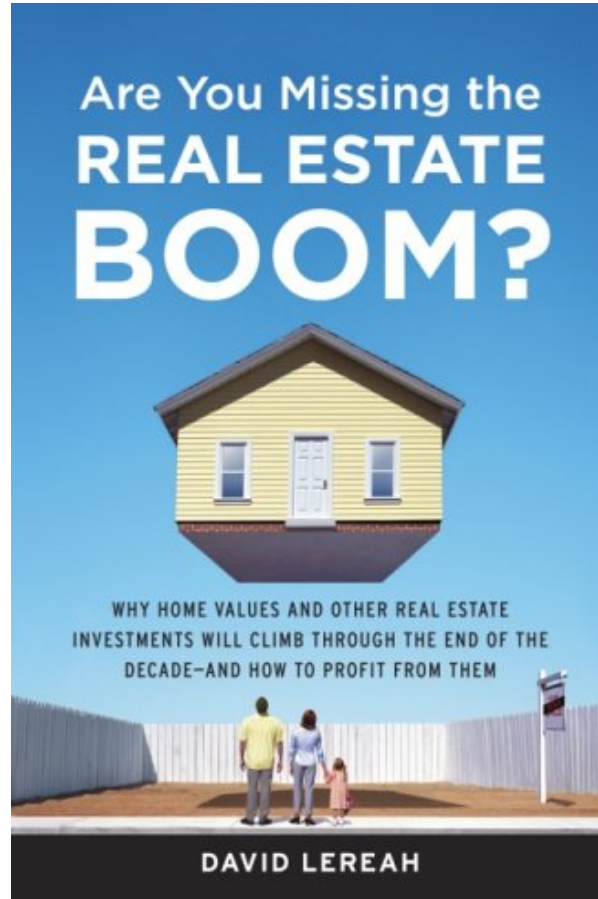


February 2005

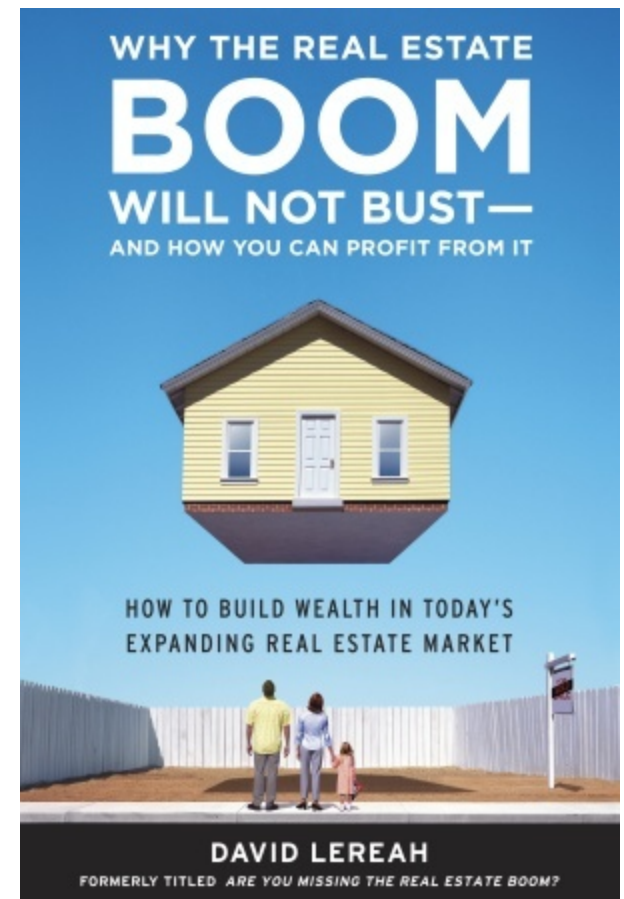
Fear of Missing Out Draws in New Investors



September 1999



February 2005



February 2006

Market Structure and Bubbles

- Overpriced assets represent a profit opportunity for bearish investors.
- Why don't they eliminate the over-pricing by short-selling? (Sell overpriced asset now and buy back later at a lower price).

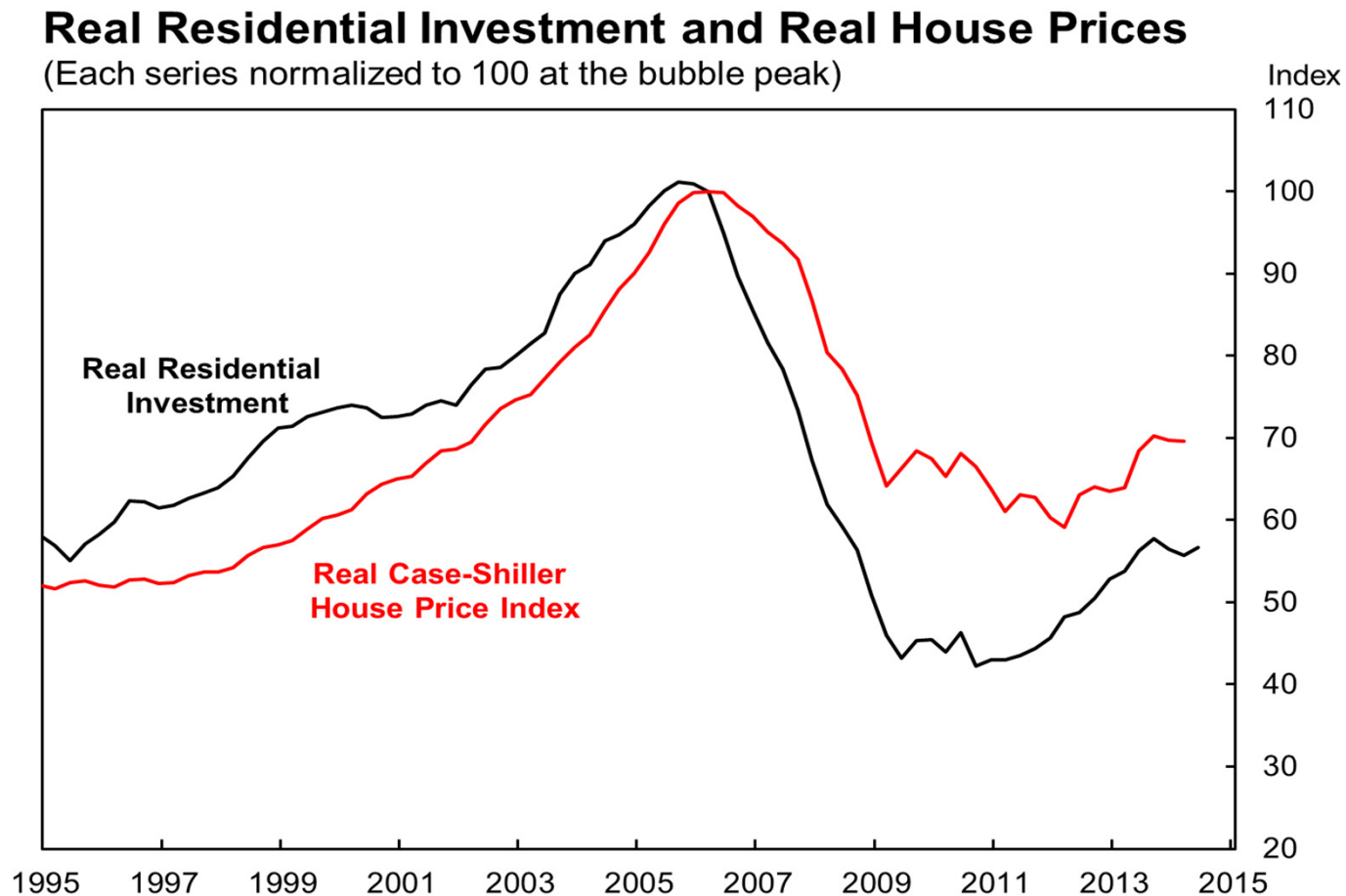
Risks and Costs to Short-selling

- Losses to short-sellers are potentially unlimited.
- Keynes: "Markets can remain irrational longer than you can remain solvent."
- Cannot short some types of assets (e.g. housing).



Economic Consequences of Bubbles

As house prices rose, builders became more optimistic, leading to overinvestment in residential capital.



Source: K.J. Lansing (2012), "Speculative Growth, Overreaction, and the Welfare Cost of Technology-Driven Bubbles," *Journal of Economic Behavior and Organization* 83, 461-483 (updated).

Economic Consequences of Bubbles

January 2009: Unfinished subdivision in Rio Vista, California

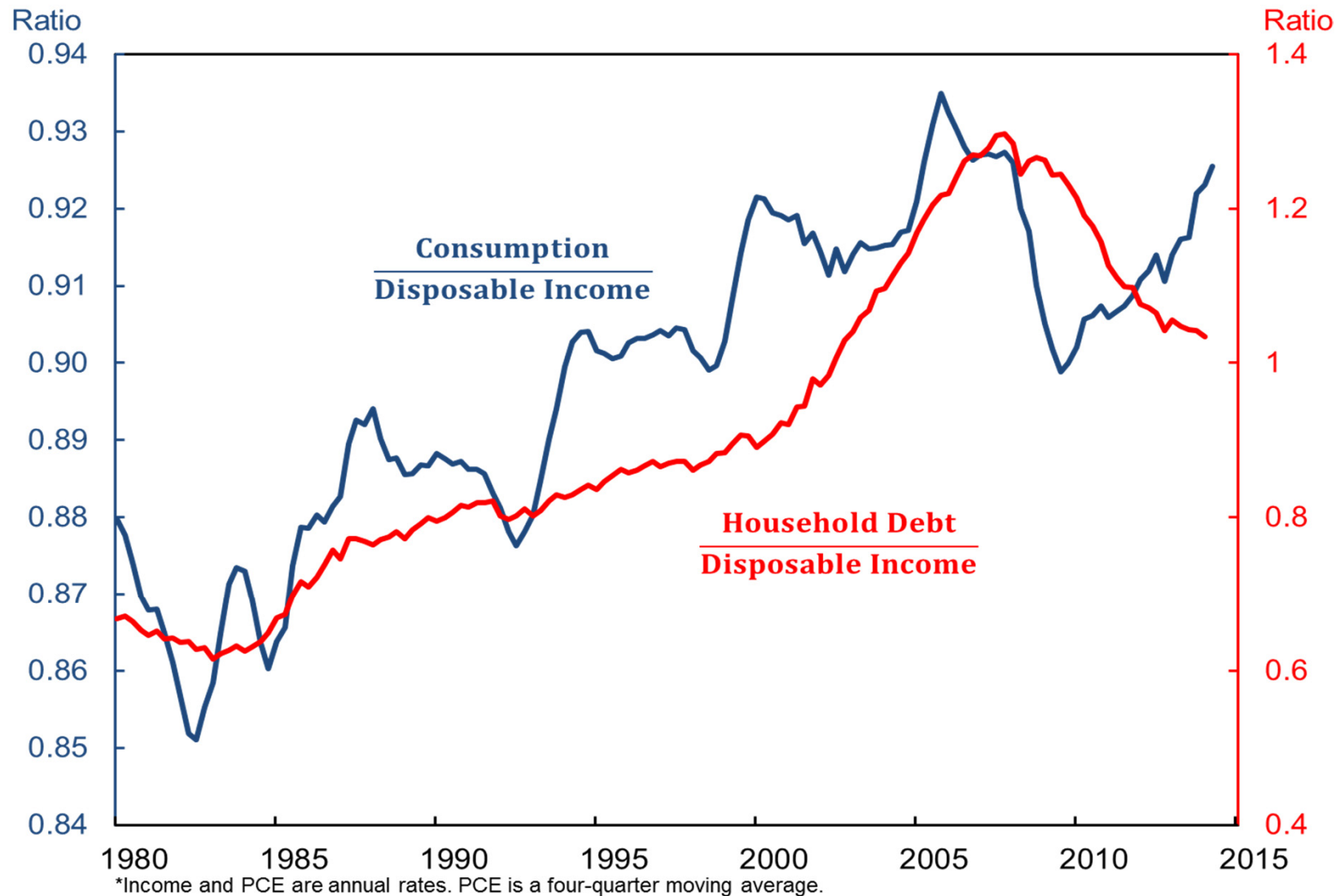


Frederic Larson / The Chronicle

Source: San Francisco Chronicle, January 26, 2009.

Economic Consequences of Bubbles

U.S. consumption binge fueled by run-up in household debt.



Borrowed Money and the Severity of Recessions

“Over-investment and over-speculation are often important; but they would have far less serious results were they not conducted with borrowed money.”

--Irving Fisher, 1933.

	House Price	Stock Price
Data from 21 countries, 1970 to 2008	Busts	Busts
Total number of busts	47	98
Mean number of busts per country	2.8	4.7
Mean price decline per episode	-18%	-37%
Mean duration of episode	10 qtrs	7 qtrs
Mean decline in GDP per episode¹	-4.3%	-1.3%

1. Relative to GDP trend.

Sources: I. Fisher (1933) “The Debt-Deflation Theory of Great Depressions,” *Econometrica* v. 1, page 341.
IMF study of 21 advanced economies, IMF World Economic Outlook (2009), Chapter 3.

Policy Implications of Bubbles

- **Pre-crisis view:** Do not lean against suspected bubbles. Instead, clean-up the damage afterwards.
- **Post-crisis view:**
“What has become patently obvious is that not dealing with certain kinds of bubbles before they get big can have grave consequences. This lends more weight to arguments in favor of attempting to mitigate bubbles, especially when a credit boom is the driving factor.”

FRBSF President Janet Yellen,
April 16, 2009



Policy Implications of Bubbles

What type of policy instruments should be used to lean against suspected bubbles? (An important, but unresolved question.)

Macroprudential Policy (First line of defense)

- Prudent lending standards, i.e. limits on borrowers' loan-to-value ratio or debt-to-income ratio.
- Countercyclical capital buffers for banks.

Monetary Policy (Second line of defense)

- Raise interest rates to restrain excessive credit growth or excessive risk taking by lenders.

Further Reading

- Lansing, K.J (2003). “Should the Fed React to the Stock Market?” *FRBSF Economic Letter* 2003-34 (November 14).
- Lansing, K.J (2005). “Spendthrift Nation” *FRBSF Economic Letter* 2005-30 (November 10).
- Lansing, K.J (2007). “Asset Price Bubbles” *FRBSF Economic Letter* 2007-32 (October 26).
- Lansing, K.J (2008). “Speculative Bubbles and Overreaction to Technological Innovation” *FRBSF Economic Letter* 2008-18 (June 20).
- Lansing, K.J (2008). “Monetary Policy and Asset Prices” *FRBSF Economic Letter* 2008-34 (October 31).
- Glick, R. and K.J. Lansing (2010). “Global Household Leverage, House Prices, and Consumption,” *FRBSF Economic Letter* 2010-01 (January 11).
- Lansing, K.J (2011). “Gauging the Impact of the Great Recession” *FRBSF Economic Letter* 2011-21 (July 11).
- Jurgilas, M. and K. J. Lansing (2012) “Housing Bubbles and Home Ownership Returns,” *FRBSF Economic Letter* 2012-19 (June 25).
- Williams, J.W. (2013). “Bubbles Tomorrow, Yesterday, but Never Today?” *FRBSF Economic Letter* 2013-27 (September 23).