

# Hunting for Bubbles... ... and what to do if you find one

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See what others don't,  
so you can do what others can't.™

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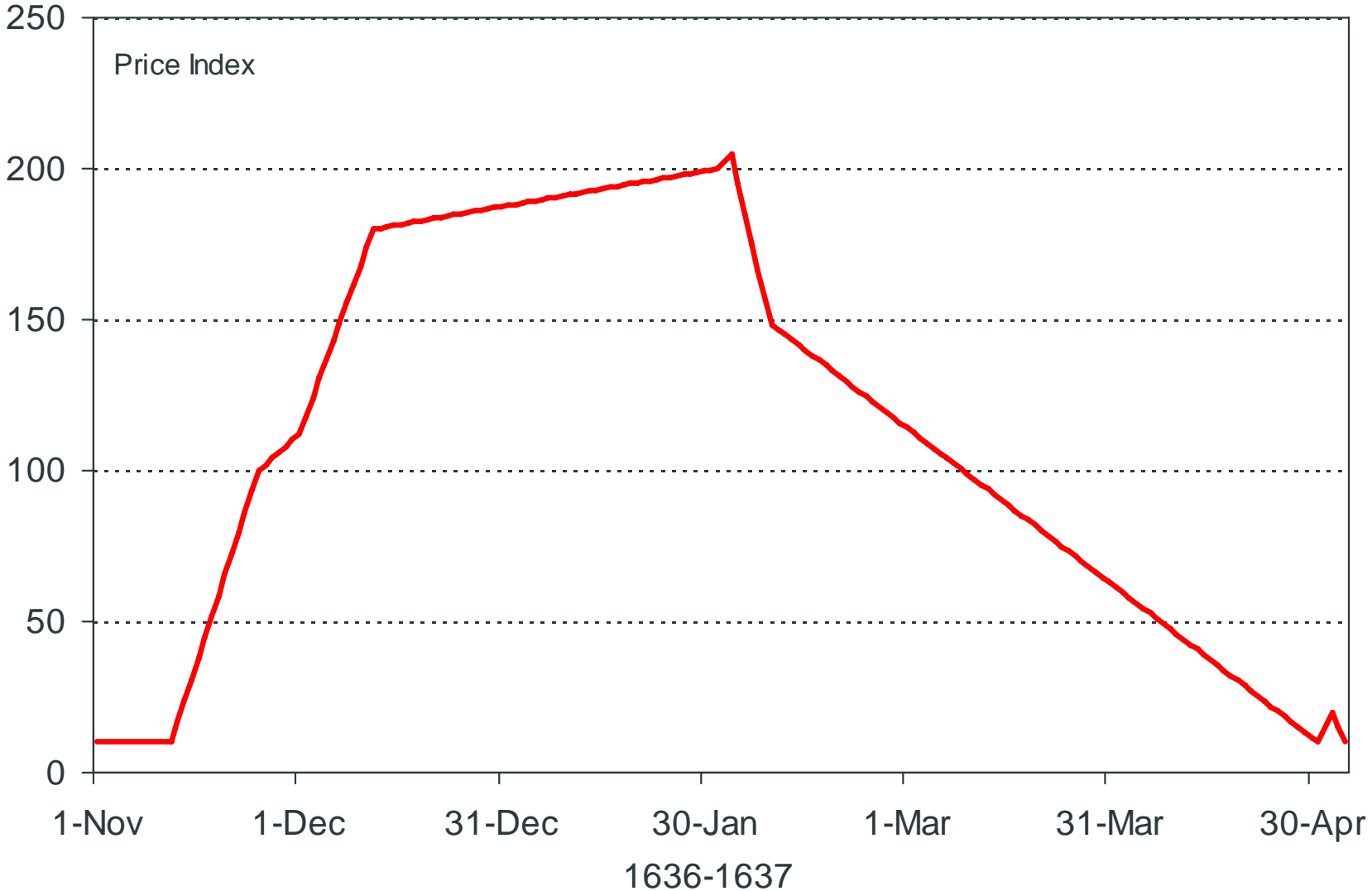
# Topics

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- **Famous Bubbles**
- **Necessary Conditions**
- **Hunting Bubbles**
- **What to do if we find one**

# Famous Bubbles

# Tulipmania 1636-1637

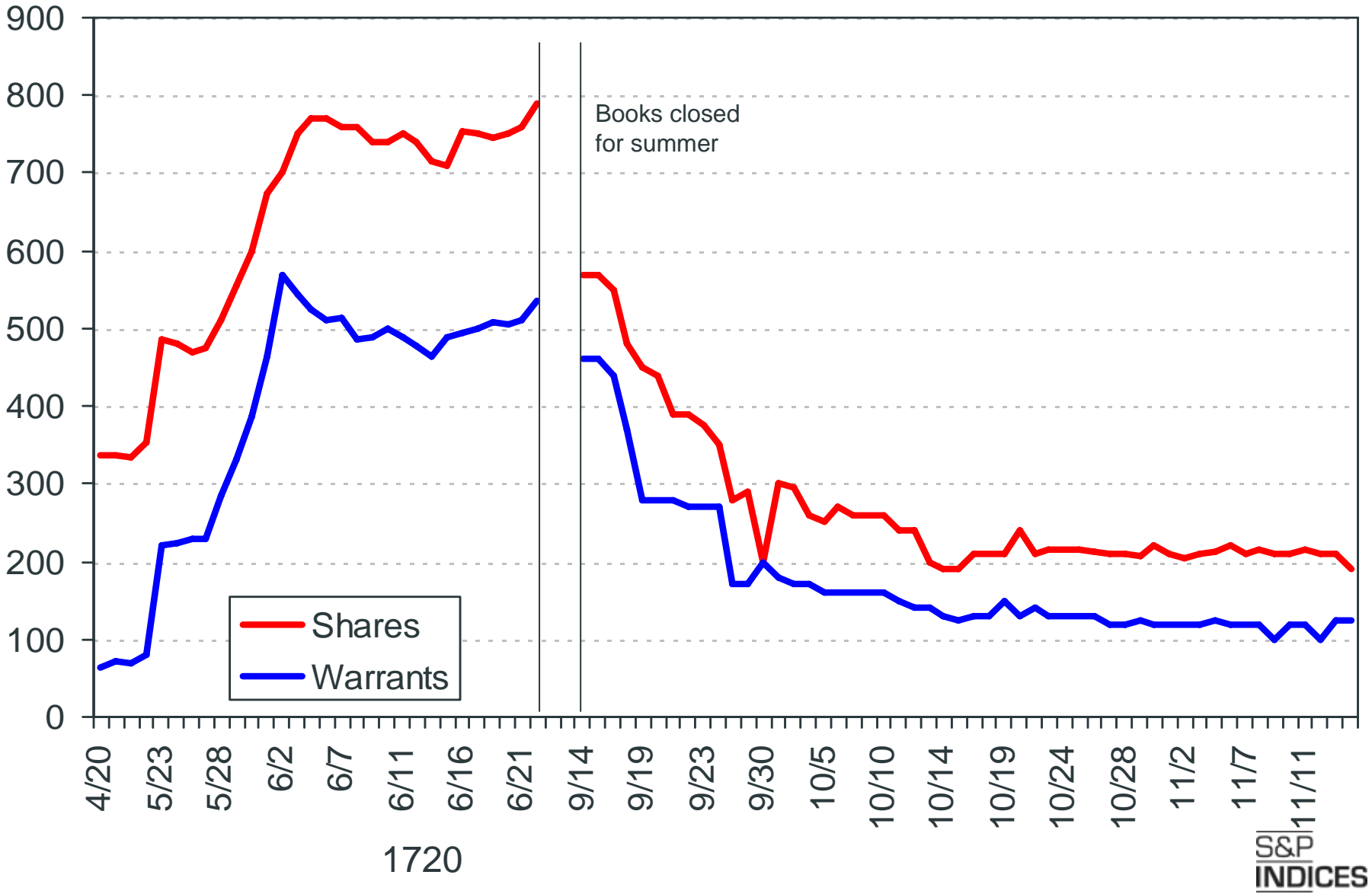


Source: E. A. Thompson, "The Tulipmania" 13 Public Choice 1-2 (January 2007)

# Tulipmania

- Tulips were the new fashion flower in 17<sup>th</sup> century Holland
- During the winter, tulip bulbs traded as forward contracts with expiration dates in the Spring. The cash market traded in Spring and Summer
- The mania struck in November-December 1636 and bulb prices surged to levels where extremely rare bulbs cost as much as a house.
- In February 1637, Dutch florists and planters, alarmed at the prices they were facing, forced the conversion of forward contracts to option contracts and the market collapsed. The Dutch government later ratified the contract change.

# The South Sea Bubble



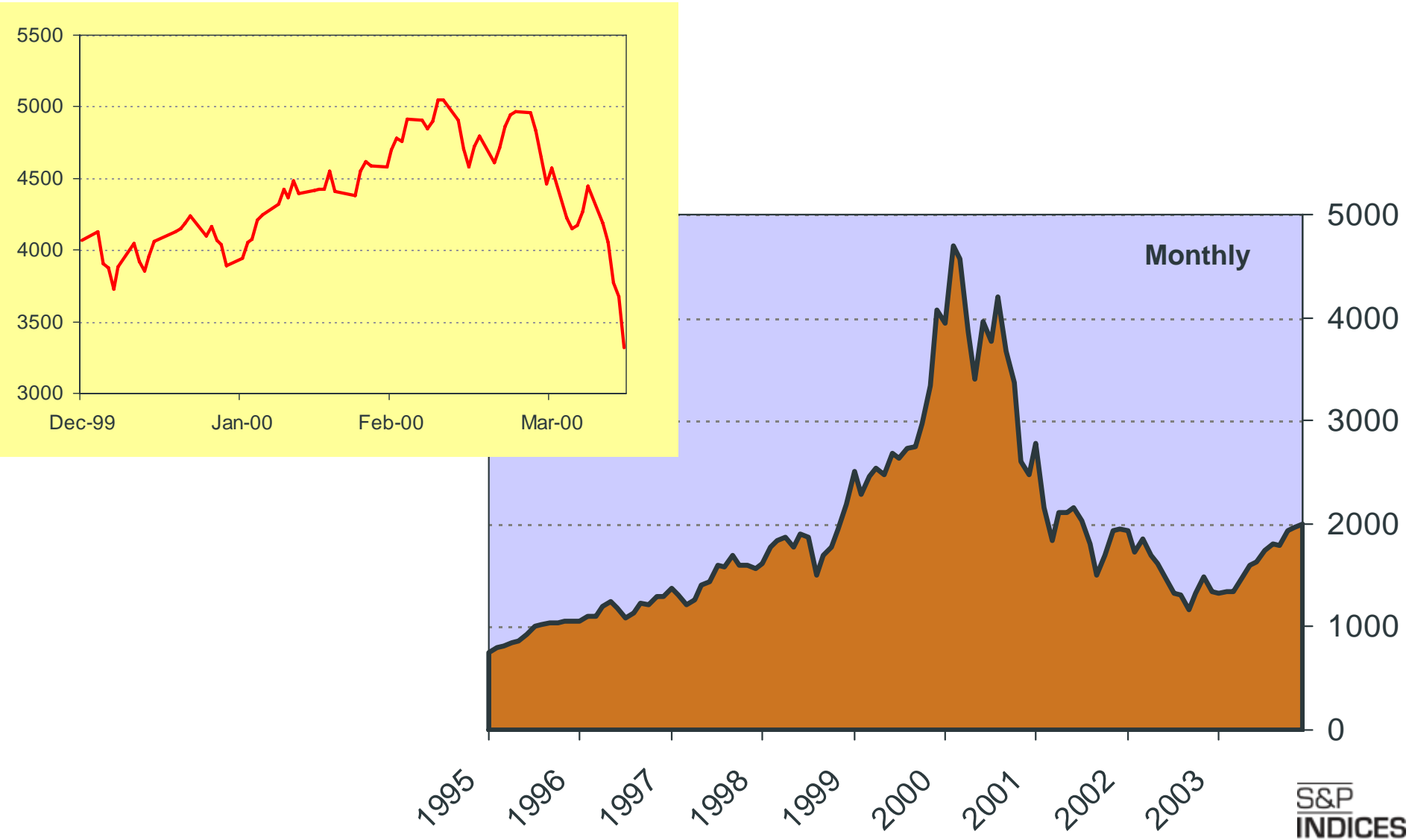
# The South Sea Bubble - 1720

- The South Sea Company was founded in 1711 in London and granted exclusive rights to trade with South America in return for taking over a portion of the government debt.
- In 1719 and 1720, the company issued stock in an equity for government debt swap.
- In 1720, directors “talked up” the stock value, inflating a bubble which burst in scandal that fall.
- The real excitement was in subscription shares – company issued compound warrants to buy more shares.

## Daily chart

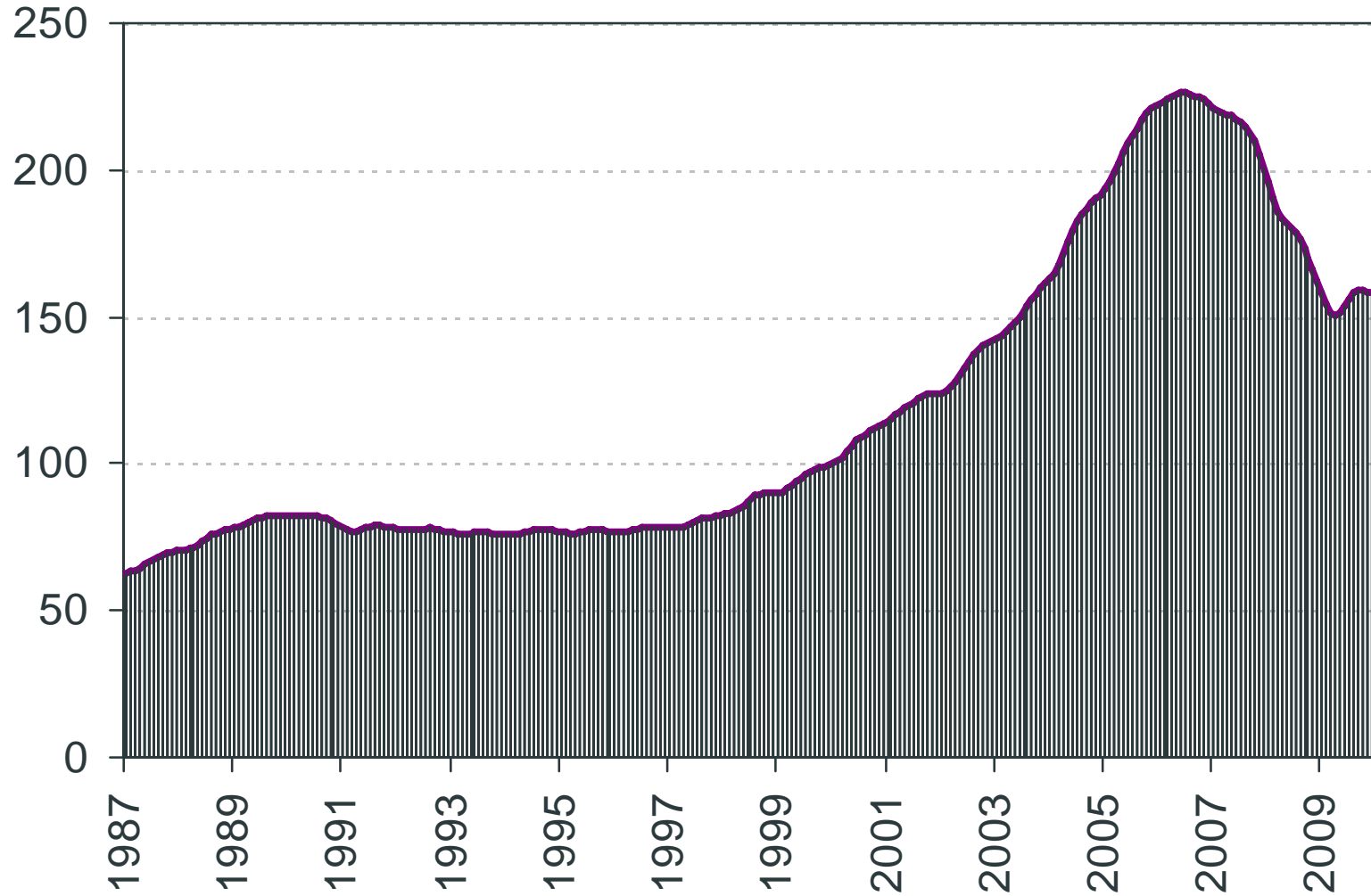
1999-2000: Index rose about 25%  
in 3 months before the peak, then  
fell 35% in 5 weeks

# NASDAQ Tech Bubble



# S&P/Case-Shiller Home Price Index

## 10-City Composite



# What is a Bubble

- **A huge run-up in prices**
  - Makes sense on the way up
    - Apparently justified by the fundamentals
    - (Almost) everyone believes in it and buys into it
  - But loses all possible sense on the way down
    - All too obvious after the fact
  - Big enough to attract attention and have an impact on markets and economies
  - “I know it when I see it” – Justice Potter Stewart describing pornography in *Jacobellis vs. Ohio* (1964)

# Necessary Conditions

- **Displacement**

An idea or event that changes people's understanding of what is happening in the market

- **Stories**

News reports, comments, blogs, gossip and more that spreads the new ideas: The “New Economy” of the 1990s, “Home Prices Never Fall” in 2004-6

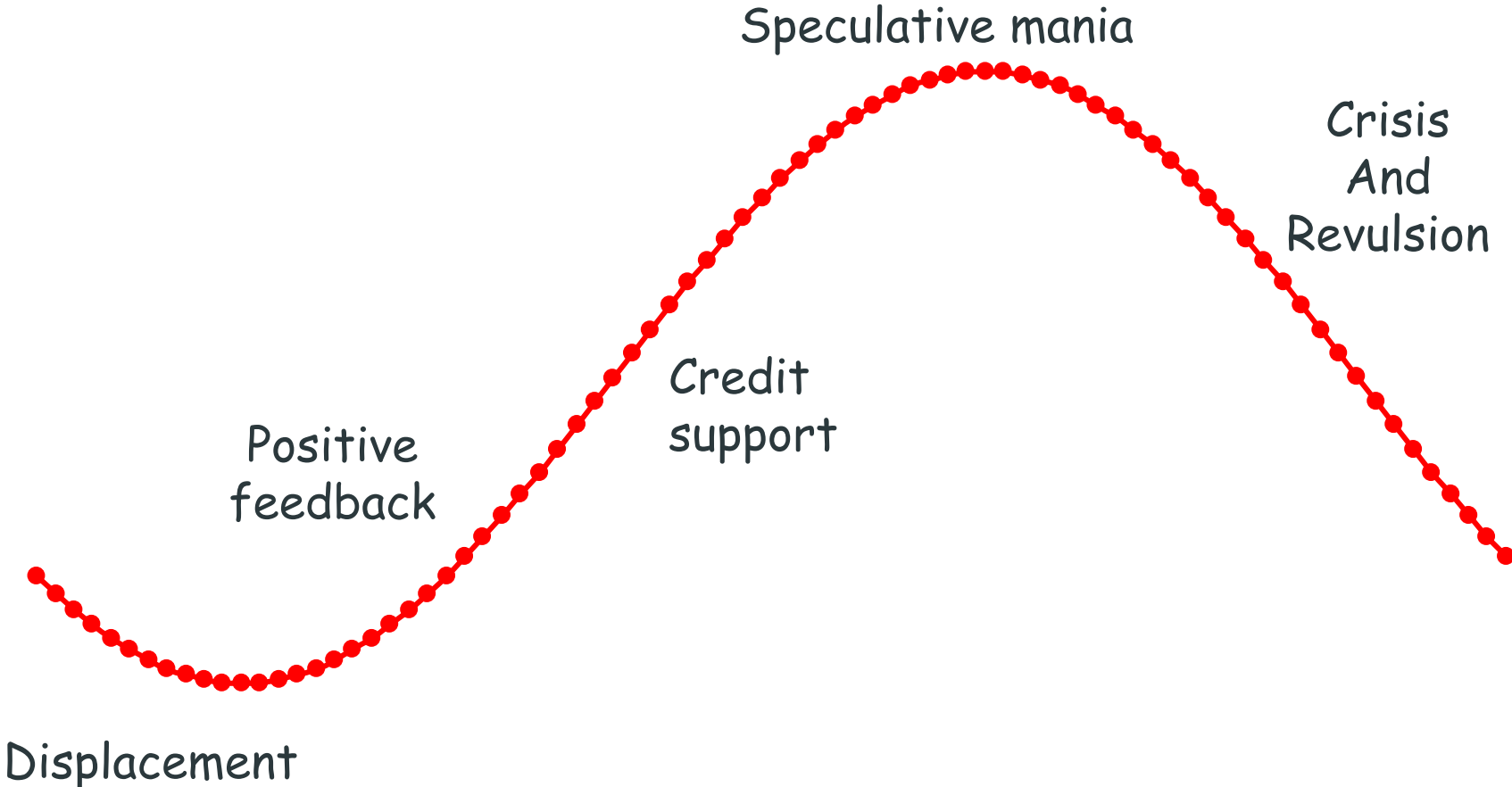
- **Positive Feedback**

Market and price movements confirming the stories

- **Credit Support**

Funds to support further buying. Shifts in asset allocation or margin buying in financial markets. Explosion in home mortgages with rising loan-to-value ratios in 2005-8

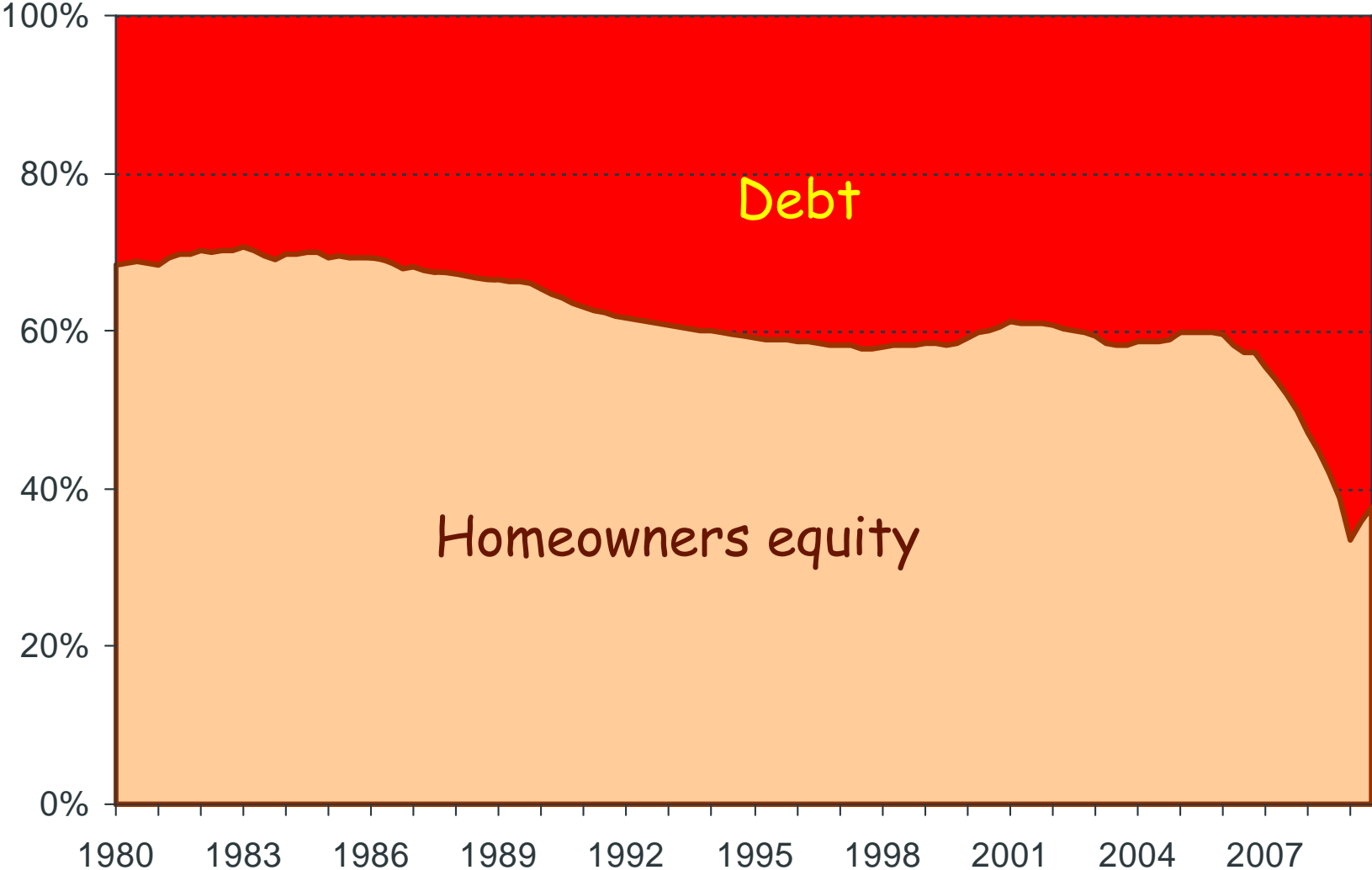
# Making of a Bubble



# Borrowed Money Damages

- **The problem is the downside, not the upside.**
- **Critical factor is the how much money was borrowed to buy into the bubble**
  - When the crunch comes, money is lost
  - Lingering indebtedness hangs over the economy and investors
  - If debts were too large, business failures surge and economic collapse spreads
- **Bubbles without debt are risky, bubbles with debt are potentially disastrous.**

# Home Owners Equity (%)

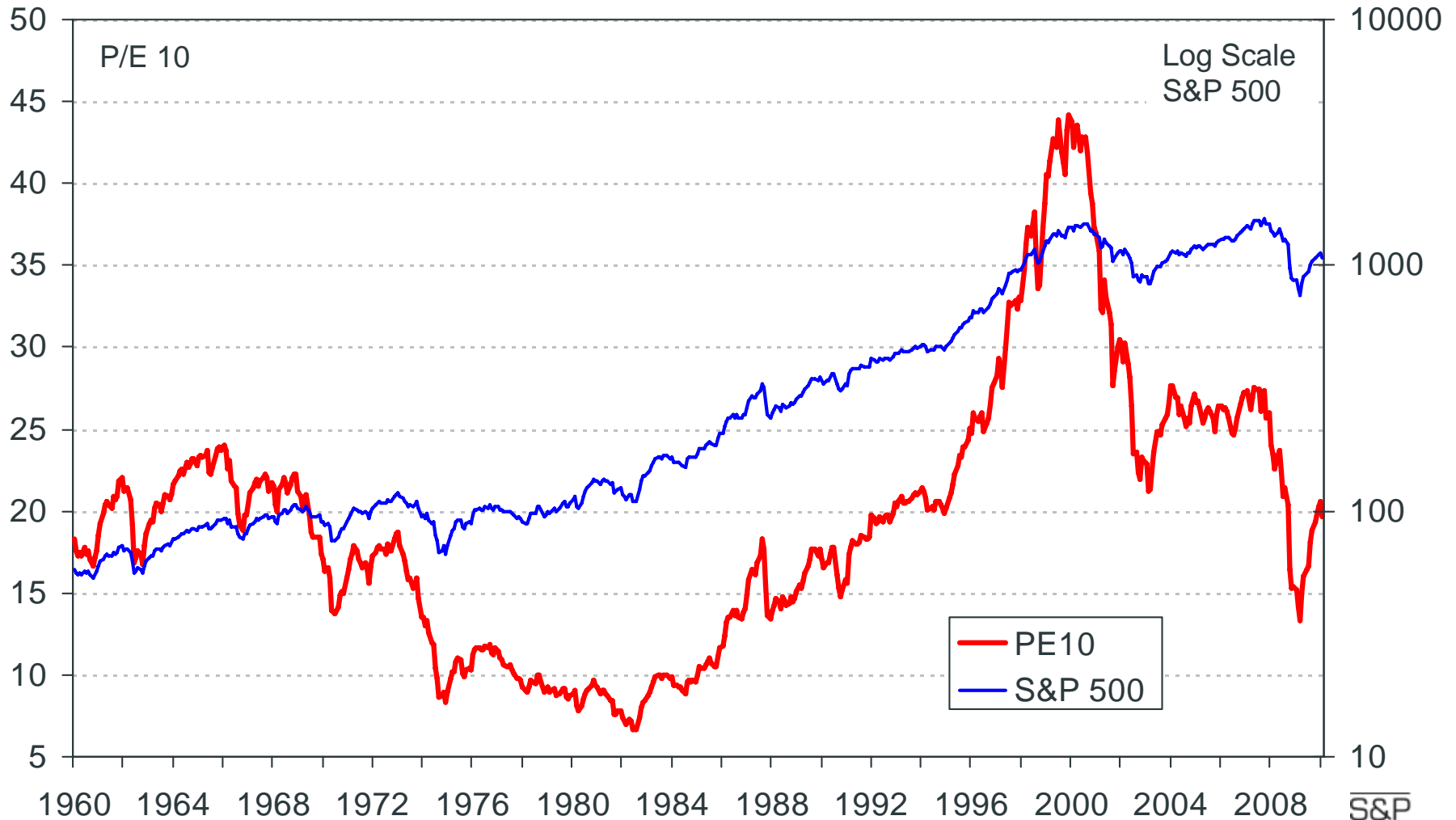


# Hunting for Bubbles in the Data

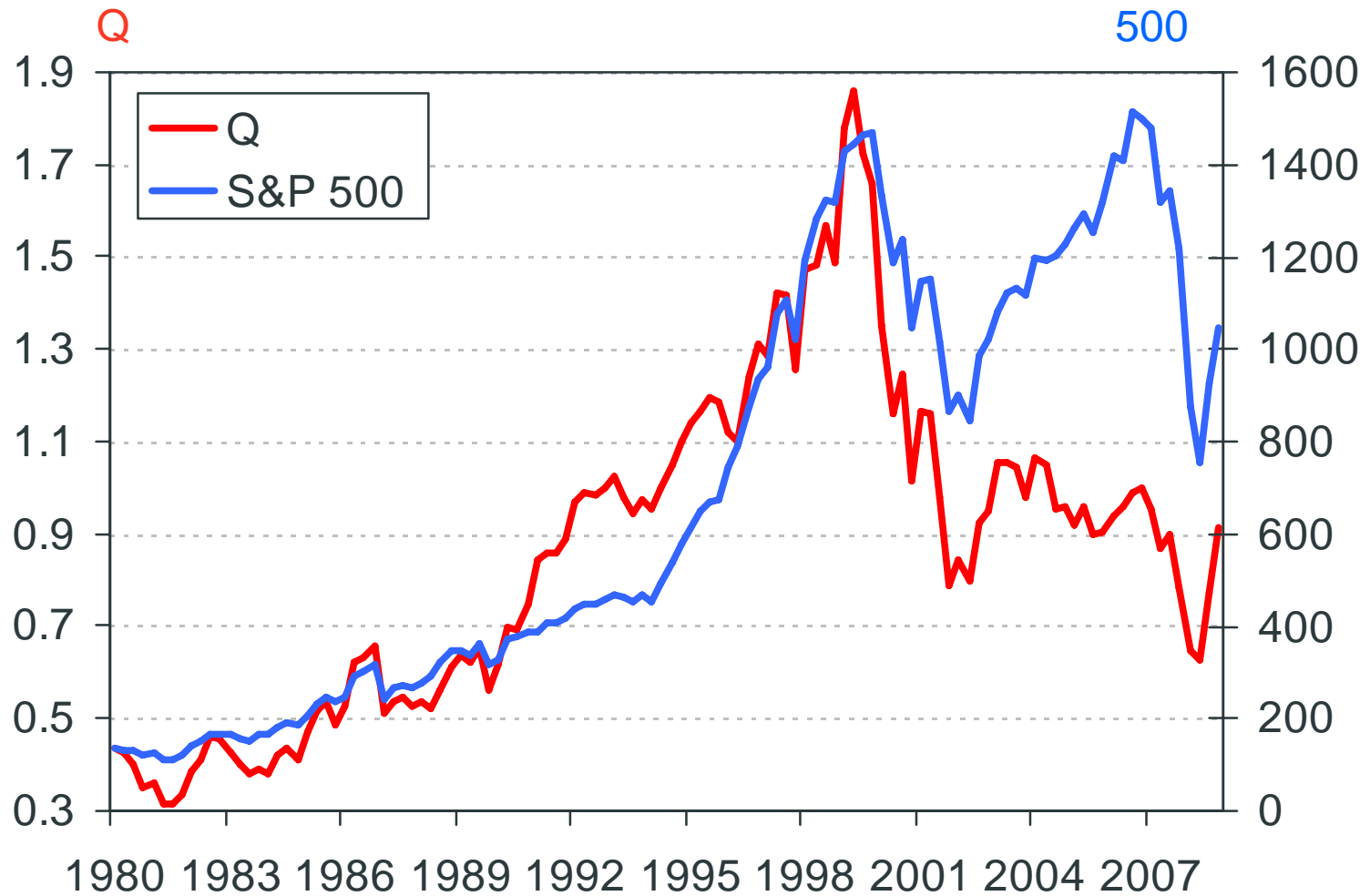
# Approaches to Finding Bubbles

- **Fundamental Value Measures**
  - Price/Earnings ratio, Tobin's Q, Rent vs. Buy in housing
- **Accelerating Gains**
- **VIX**
- **Econophysics**

# Cyclically Adjusted 10 Year P/E Ratio S&P 500

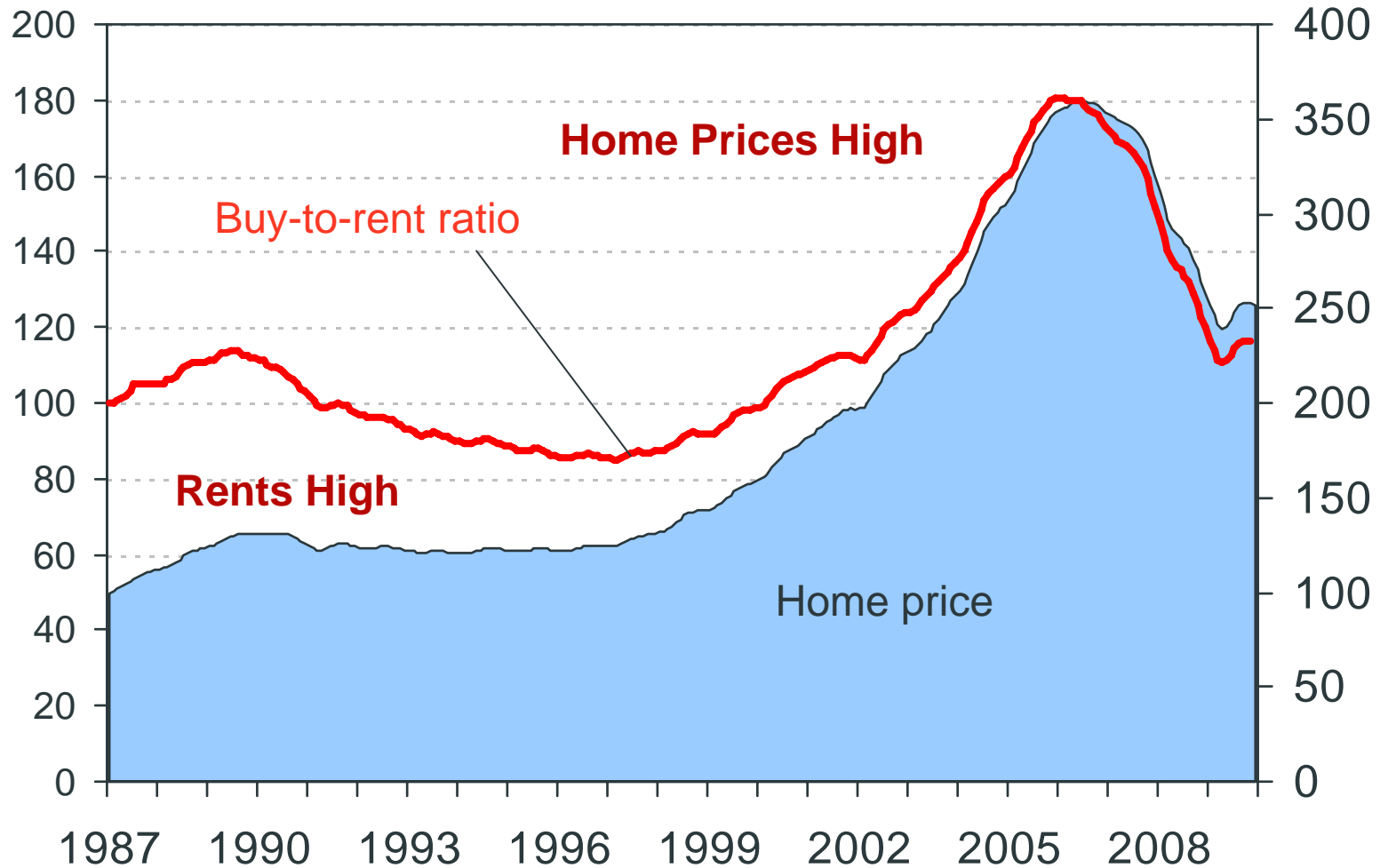


# S&P 500 Tobin's Q



Tobin's Q = ratio of market value to replacement cost of nonfinancial corporations Data from Federal Reserve Flow of Funds, equations based on John Mihaljevic, Advisors Perspective, July 14, 2009

# Housing: Rent or Buy

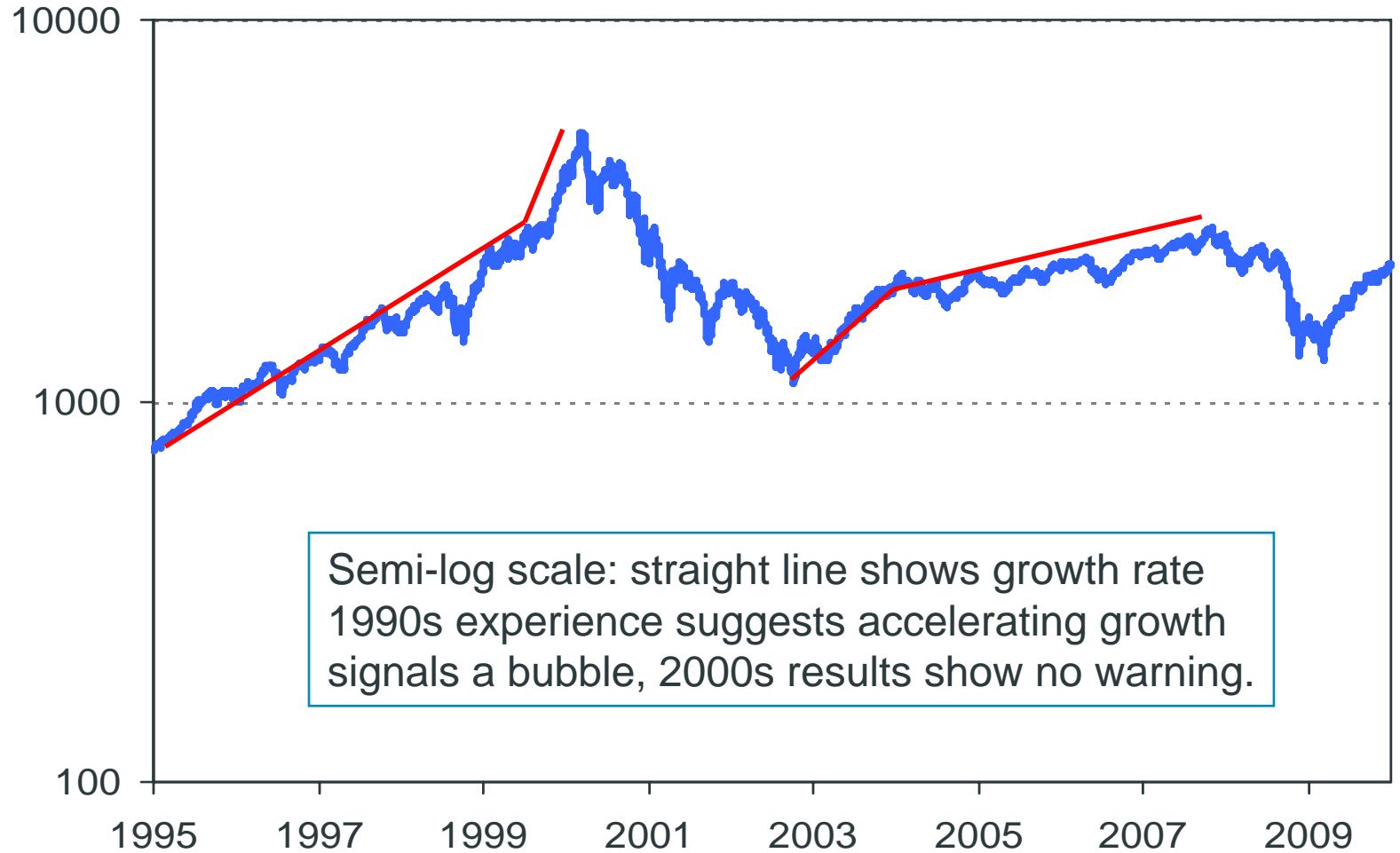


S&P/Case-Shiller Home Price 10-Cities divided by U.S. CPI  
Owners Equivalent Rent, scaled to January, 1987=100

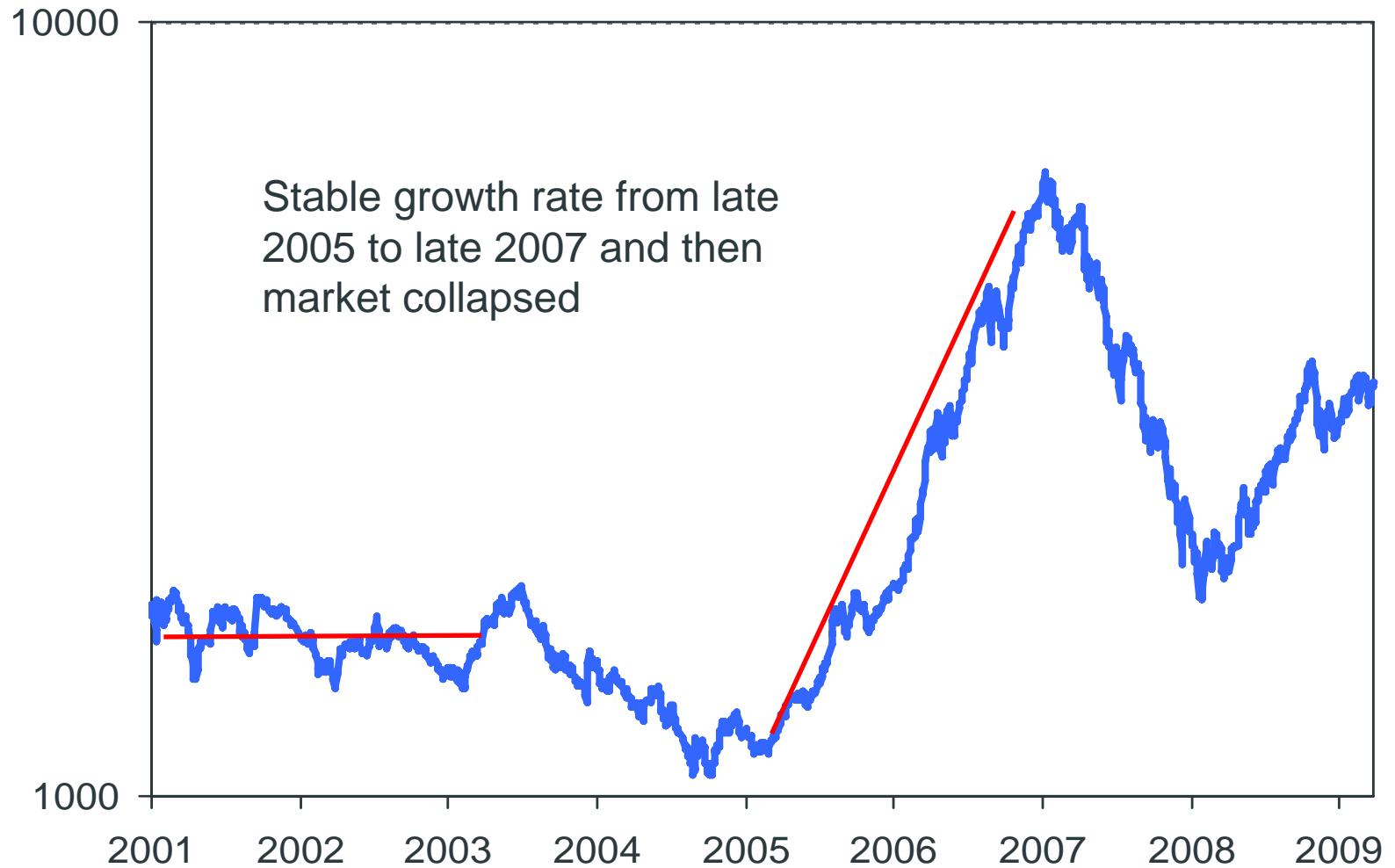
# Fundamentals Measures to Detect Bubbles

- Signals develop over months, quarters or even years
- Detecting a bubble is not knowing when it will burst
- Do Investors confuse market timing with seeking safety?
  - Are these measures tickets to ride bubbles or warning lights recommending escape

# Acceleration: NASDAQ

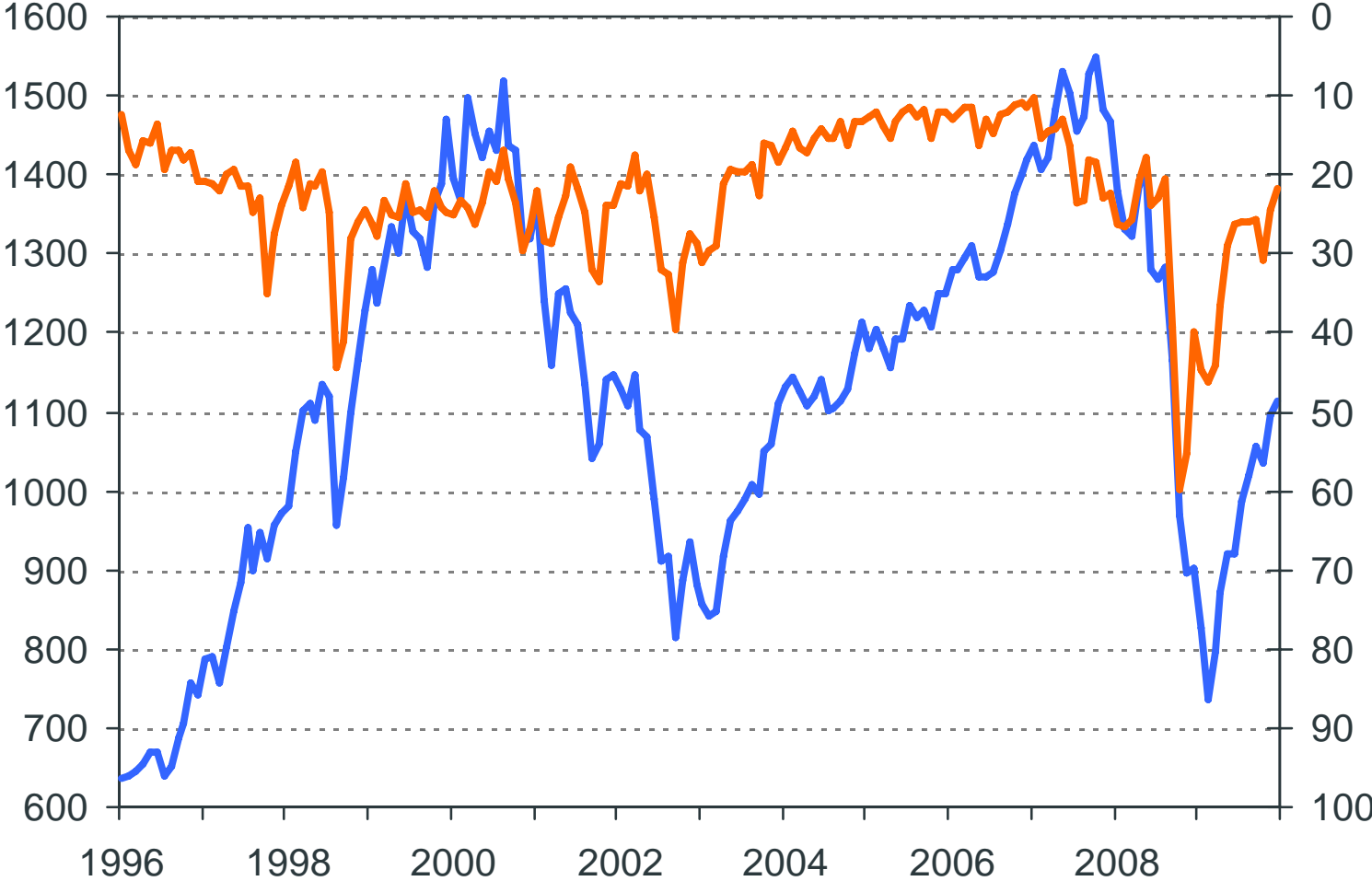


# Acceleration: Shanghai



# VIX and S&P 500

No lead-lag relation



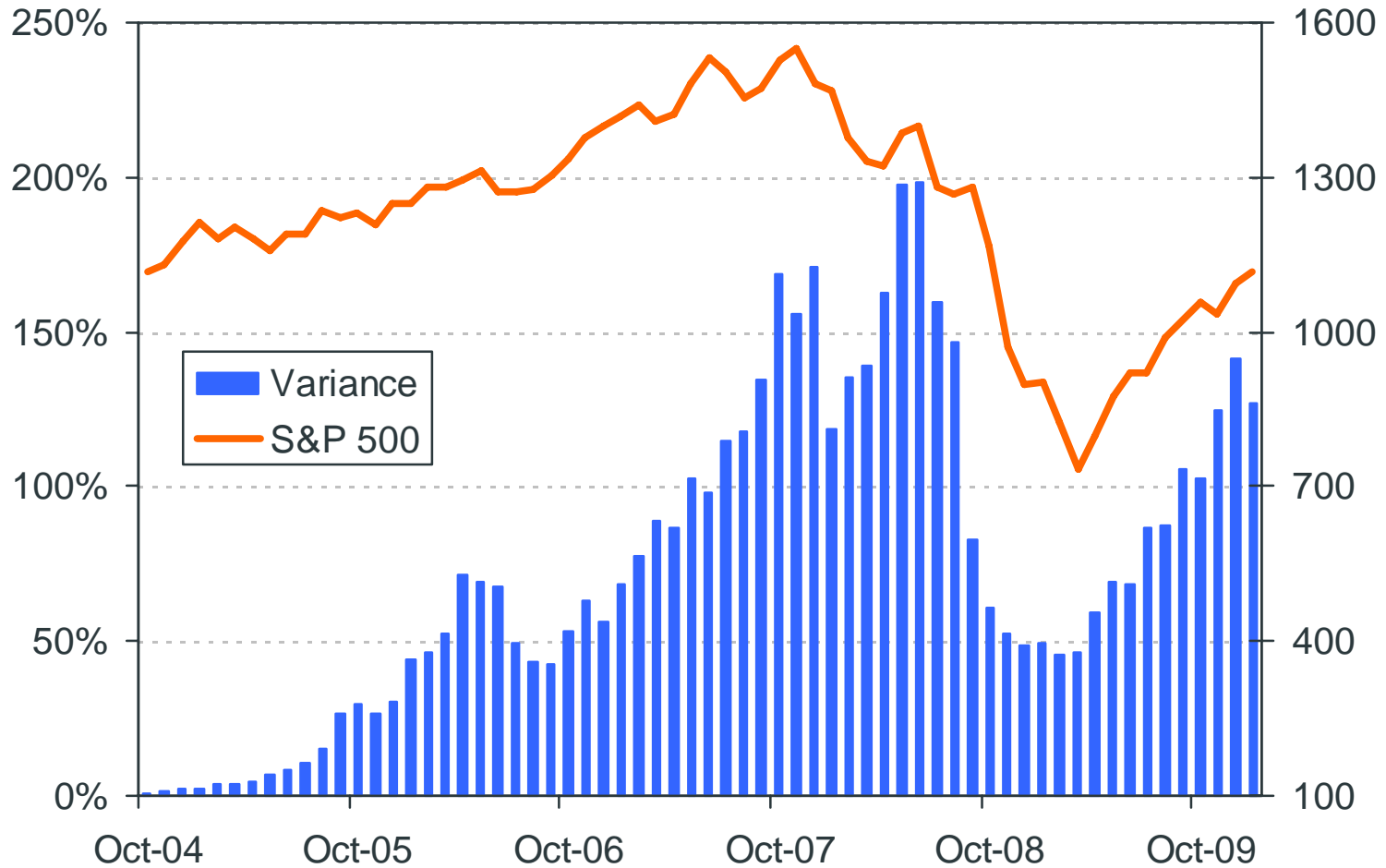
# Accelerating to VIX...

- **Accelerating** price increases characterize bubbles
- Some argue this defines a bubble
- Examples don't support this
  - Sometimes acceleration becomes a bubble
  - Other times not
  - Bubbles can form or burst with little acceleration first
- **VIX**
  - VIX track changes in the S&P 500 closely
  - Neither VIX nor the S&P 500 anticipate one-another at daily or monthly frequencies,
  - Lead/lag relations do not appear to be significant.

# Econophysics and Variance Models

- Economists, technicians and traders aren't alone in trying to predict market crashes
- Physicists and mathematicians join the search, bringing extensive mathematical tools.
- They try to look “inside” an index and see how the relations among the components vary.
- The example is from the S&P 500, although the same thing can be seen in home prices.

# Variance Models



# Predictions

- The Econophysics approach, like the others, can strongly suggest we're in a bubble
- The variance of cumulative stock returns rises, and falls, with the market as the index becomes more and more concentrated.
- The concentration is driven by a surge in one group of stocks.
- **However, none of the measures either give absolute assurance the market is a bubble or any degree of warning before the collapse.**

# What to do with the bubble

# Bubble Predictions

- The question is not whether we can predict bubbles, but if the predictions will be accurate
- The best we can (hope) to do is give a sense of confidence or probability for a prediction...
- Suppose we say there is an 80% chance the market will crash and we short everything... what happens if the 20% comes true?

# Puzzles and Decisions

- Faced with the chance we're in a bubble what next?
  - **Ride the bubble betting it won't burst before we're out the door?**
  - **Short everything now?**
- We need to look at both the upside and the downside
- We need to consider what if there is a crash, and what if there isn't

# Decisions without prediction

**Minimax** – choose the row that minimizes the maximum loss whichever market condition is true...

If there's a crash, maximum loss is -500

If there's no crash, maximum loss is -150

Choose first row, Crash protection

		Market Condition	
		Crash	Bubble and Ride
Investors Expected Market Condition	Crash	+100	-150
	Bubble and Ride	-500	+1000

# Decision Using Prediction

Use a forecast – 80/20 there will be a crash – to estimate expected gains or losses and choose the strategy.  
In this case, bet there will be a crash

		Market Conditions		Expected Value
		Crash	Ride	
		80%	20%	
Investor's Forecast of the Markey	Crash	+100	-150	+50
	Ride	-500	+1000	-200

# What next...

- No surprise that we haven't found a reliable way to forecast markets
- But we can use both fundamental and market analysis to estimate the probability that we're in a bubble and getting close to the Pop
- Whether we want to ride the bubble or short the market, we best consider both our guesstimates of it bursting as well as the up-side and the down-side of our bets.
- Place your bets...

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# Thank you

**Beware the unseen bubble**

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