Irrational Exuberance Revisited

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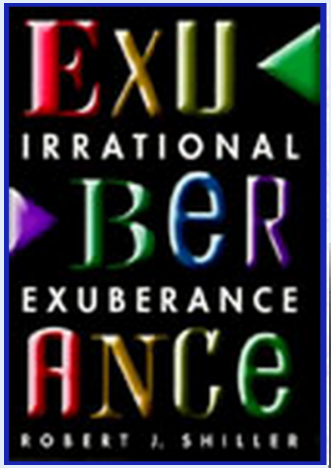
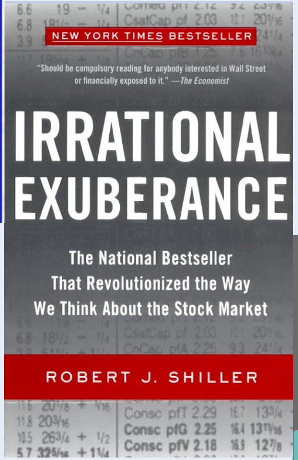
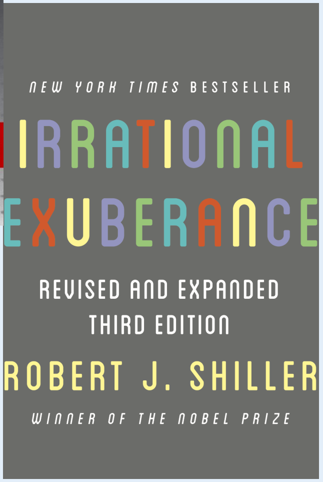
Shiller Irrational Exuberance Three Editions

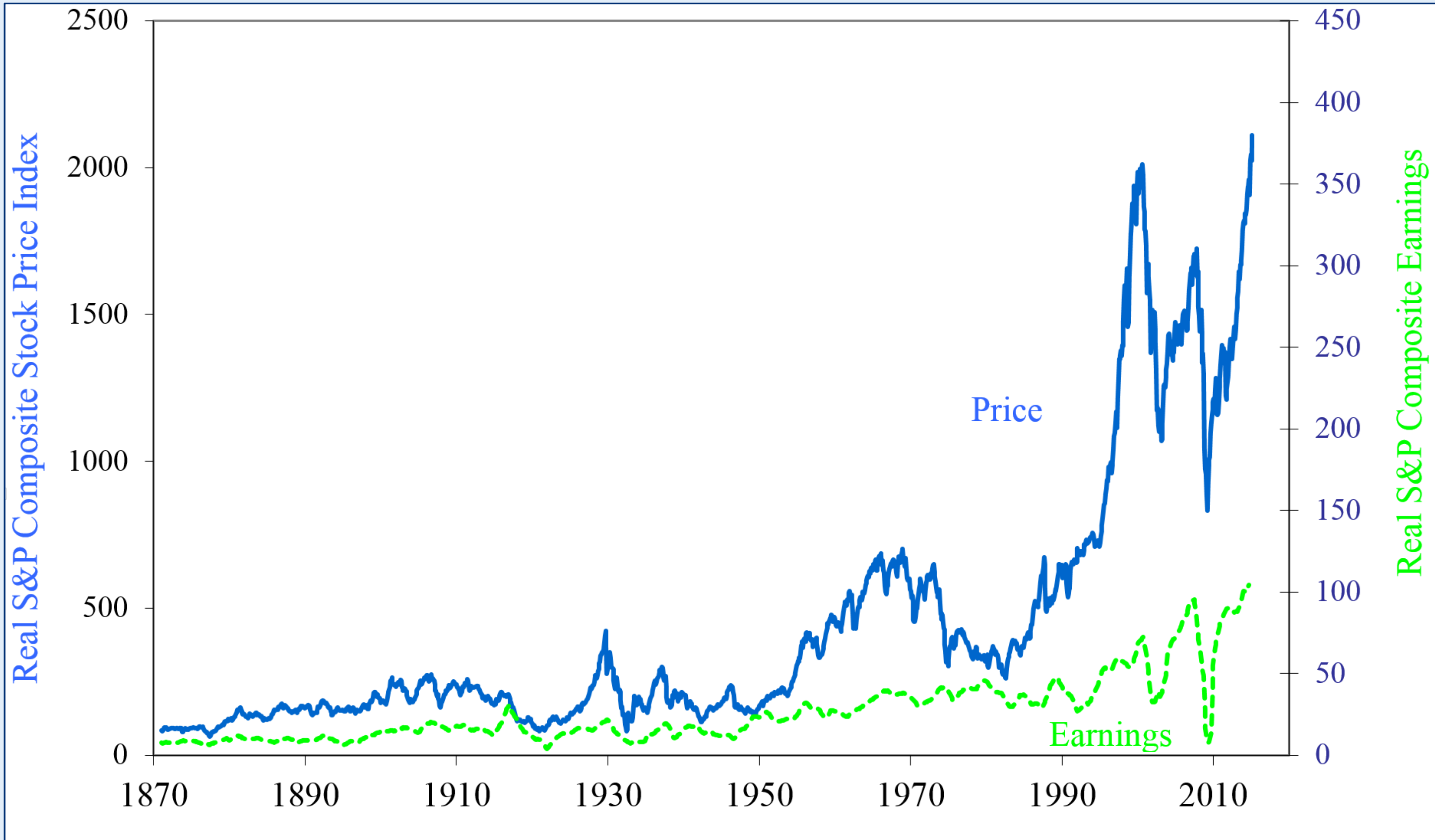
- First Edition: 2000
  at end of what I call the "Millennium Boom"
- Second Edition: 2005
  near end of what I call "Ownership Society Boom," 2003-2007
- Third Edition: 2015
  during the time of what I call the "New Normal Boom" 2009-2015







Real U.S. Stock Prices and Real Earnings 1871-2015



History of Thought

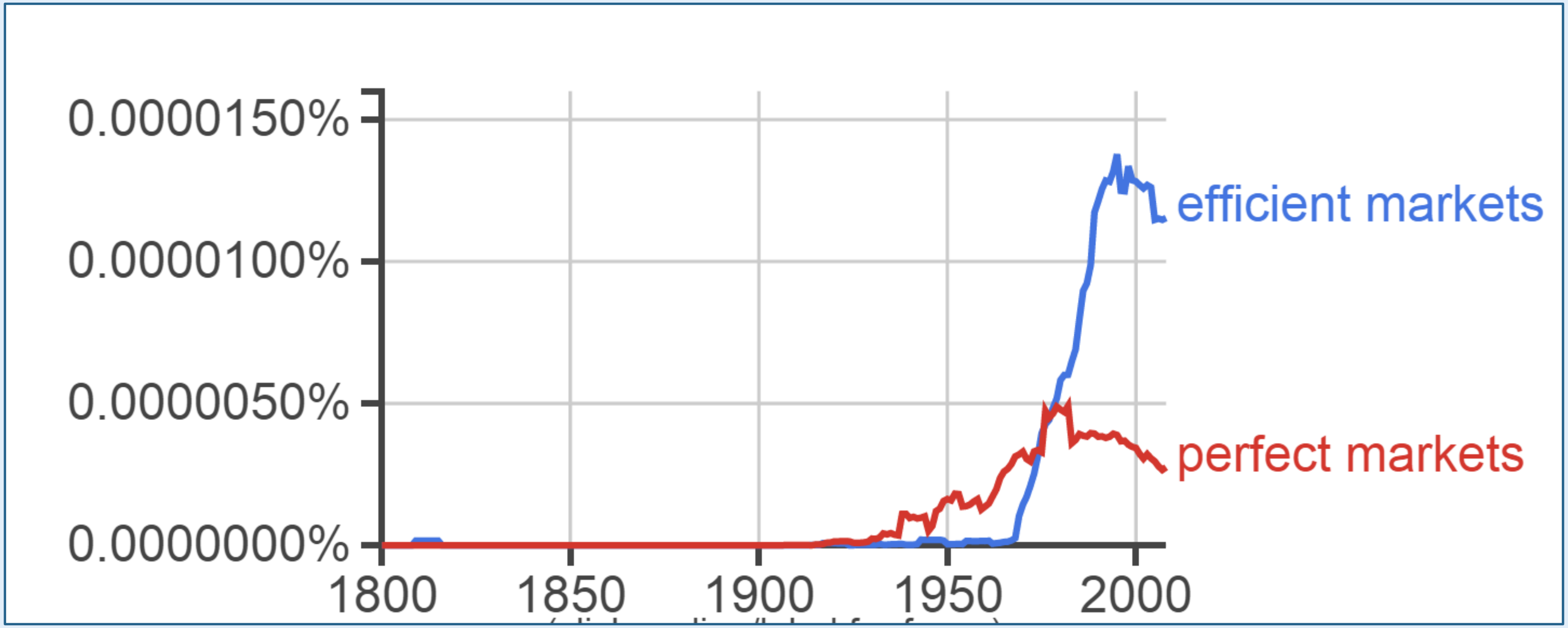
- Ill-Defined Notion of Efficient Markets Dates Back to 19th Century, but Blossomed in Second Half of 20th
- Behavioral Finance Revolution Last Years of 20th Century

Earliest known statement of the idea that became efficient markets theory

- "When shares become publicly known in an open market, the value which they acquire there may be regarded as the judgement of the best intelligence concerning them."

    - George Gibson, *The Stock Exchanges of London Paris and New York*, G. P. Putnam & Sons, New York, 1889

Earlier Idea of Perfect Markets



The Idea of Perfect Markets, 1901

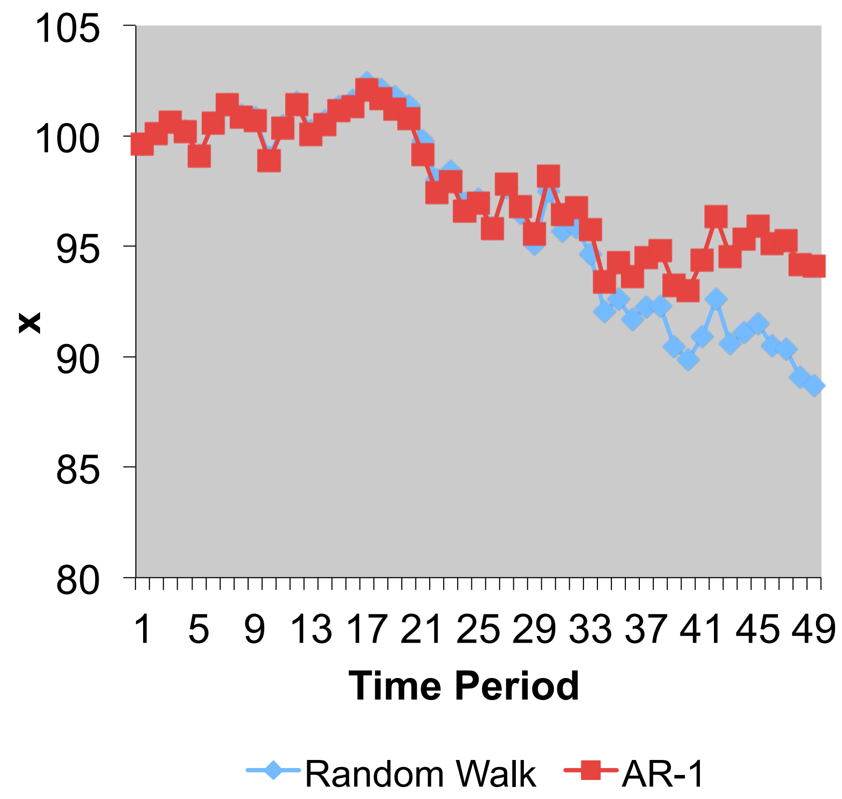
- Charles Conant, "The Uses of Speculation," *Forum*, 31(6):698, August 1901

Through the publicity given to quotations on the exchanges, therefore, and the promptness of communication between the exchanges of the world, goods and capital move from place to place under the influence of the law of the greatest good to the community, with the least waste of energy, the smallest misdirection of effort, and the most continuous efficiency possible in the present state of knowledge among men.

Earlier Concept of Perfect Markets Did Not Rely on Concept of Conditional Expectation

Random Walk and AR-1 Model

- Random Walk: $x_t = x_{t-1} + \varepsilon_t$
- First-order autoregressive (AR-1) model: $x_t = 100 + \rho\,(x_{t-1} - 100) + \varepsilon_{t.}$ Mean reverting (to 100), 0< ρ<1.
- Random walk as approximate implication of unpredictability of returns
- Similarity of both random walk and AR-1 to actual stock prices.



Event Studies:
Eugene Fama, Lawrence Fisher, Michael Jensen, Richard Roll
International Economic Review 1969

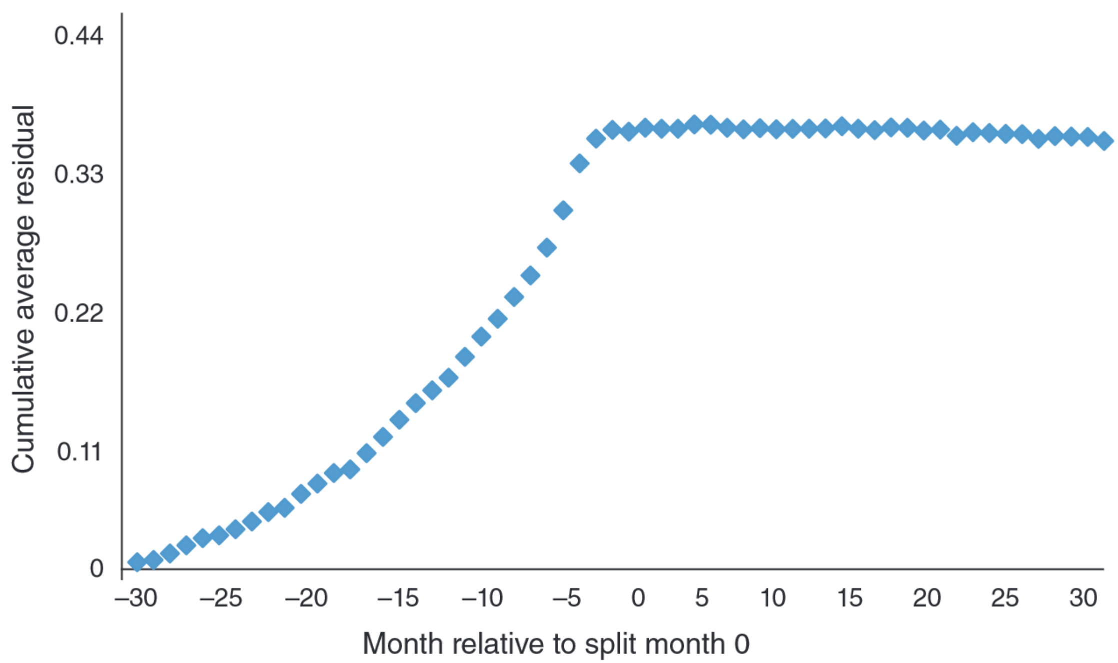
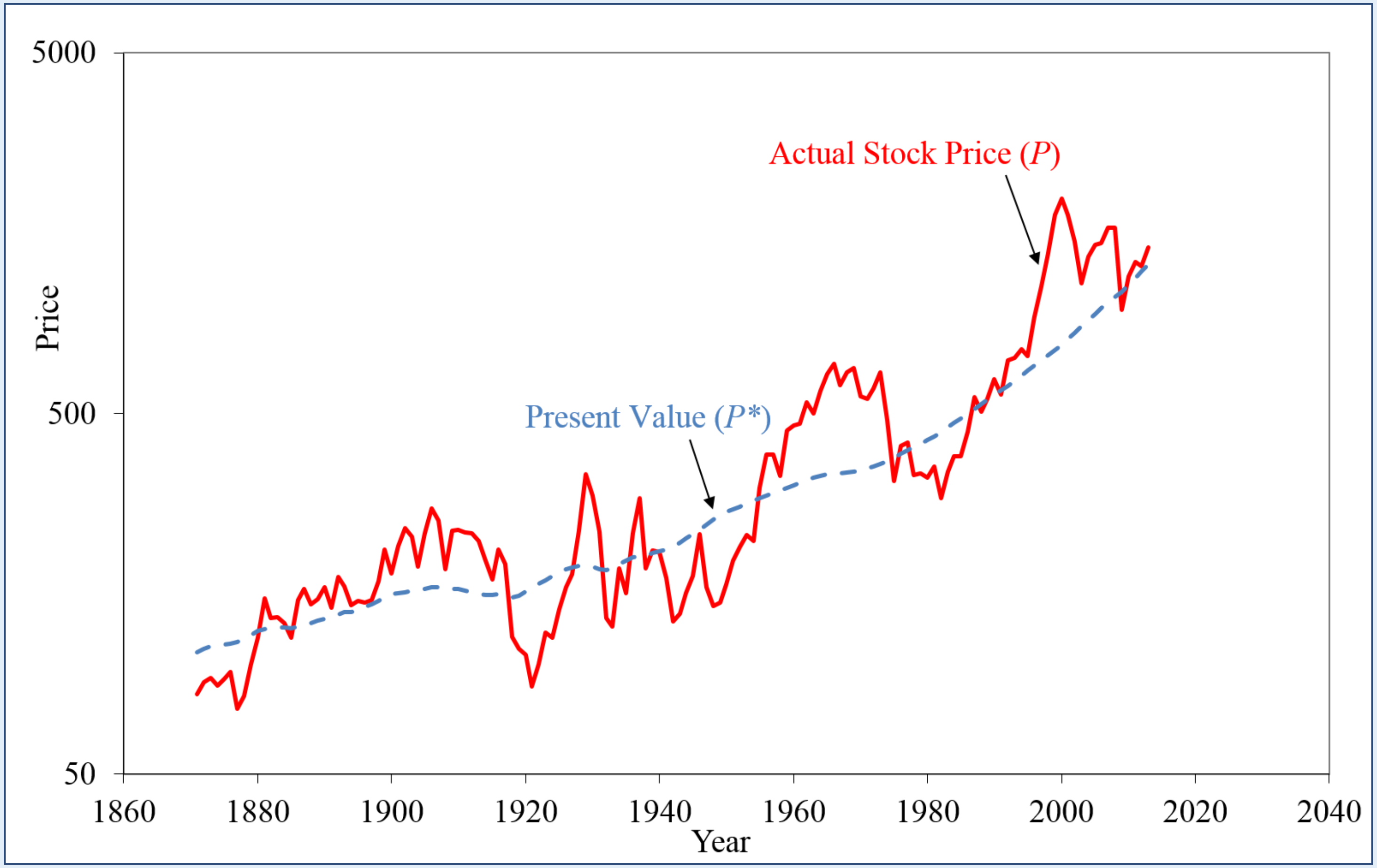


FIGURE 1. CUMULATIVE AVERAGE RESIDUALS IN THE MONTHS SURROUNDING A SPLIT

Source: Fama et al. (1969).

Real Stock Prices Compared with Present Value of Real Dividends, “Do Stock Prices …” *AER* 1981 updated



"Stock Prices and Social Dynamics" *Brookings* 1984

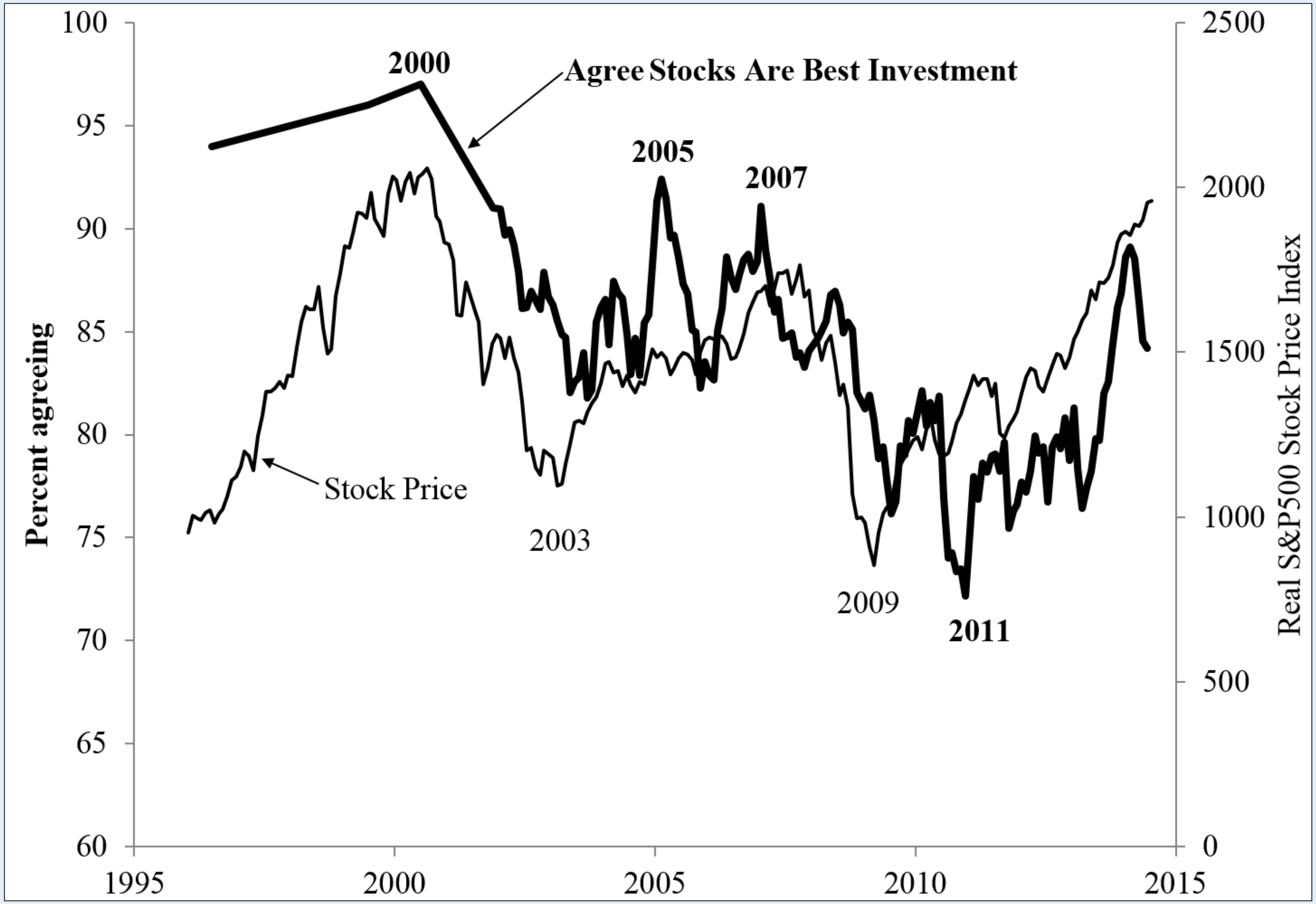
- Demand for stocks per share by ordinary investors A_t is somewhat predictable
- Demand for stocks by smart money per share is the difference between rationally expected return next period and the constant riskless rate r , divided by constant φ
- It follows that:

$$P_t = E_t(P_t^{*A}) = E_t \sum_{k=0}^{\infty} \frac{1}{(1+r+\varphi)^{k+1}} (D_{t+k} + \varphi A_{t+k})$$

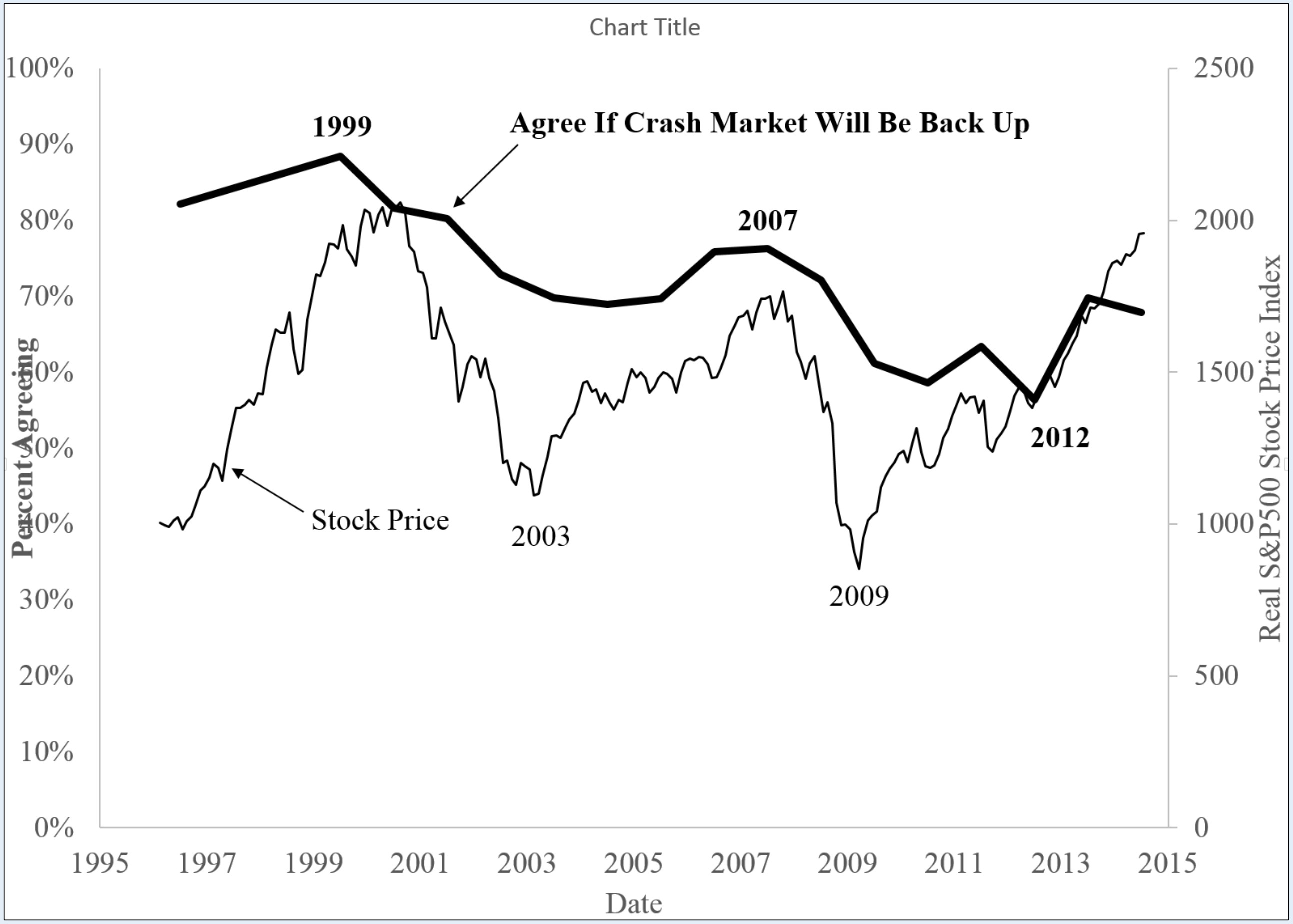
The Basic Theory of Speculative Bubbles in *Irrational Exuberance*, 2000

- Bubbles are driven initially by an unusual confluence of an array of precipitating factors
  - Many of these factors are stories, often human interest stories (narrative basis for human thinking)
  - Some of these factors are naïve theories
- Bubbles reach epidemic proportions with amplification mechanisms
  - Price-to-price feedback
  - Price-to-GDP-to-price feedback
  - Price-to-corporate-earnings-to-price feedback
  - Naturally Occurring Ponzi Scheme (Pyramid Scheme, Money Circulation Scheme, Pilotenspiel)

Evidence of Feedback Mechanism: Results of Individual Investor Survey: Stocks Are the Best Investment



Evidence of Feedback Mechanism: Results of Individual Investor Surveys: Buy-on-Dips Confidence Correlates with Stock Market Level



Individual and Institutional Investor Survey: Valuation Confidence

Perceptual Biases Relevant to Financial Markets

- Framing
- Representativeness heuristic
- Attention anomalies
- Regret theory and envy
- Ego involvement

The Behavioral Finance Revolution After 1990

- Sociology: Collective consciousness Durkheim (1893), collective memory Halbwachs (1925)
- Social psychology: *Groupthink* , Janis (1971)
- Selective attention: William James 1890, ("rational inattention" Sims 2003)
- News media, Internet, as amplifier of social epidemics
- Even population biology, epidemiology, and neuroeconomics are coming into play

Precipitating Factors for Millennium Bubble 1982-2000

- The World Wide Web
- Triumphalism
- Culture Favoring Business Success
- Republican Congress & Capital Gains Taxes
- Baby Boom
- Media Expansion

- Optimistic Analysts
- 401(k) Plans
- Rise of Mutual Funds
- Decline of Inflation
- Expanding Volume of Trade
- Rise of Gambling Opportunities

Additions and Deletions to Precipitating Factors for the Ownership Society Boom 2003-7

Additions:

- Ownership Society Theory
- Greenspan put

Deletions:

- The World Wide Web after Dot-Com burst
- Republican Congress (Senate tied in 2000 elections, both houses went Democratic in 2006 election)
- Triumphalism faded with memories of Deng Xaioping (d. 1997) and Boris Yeltsin (d. 2007)

Rather Different Precipitating Factors for the New Normal Boom 2009-15

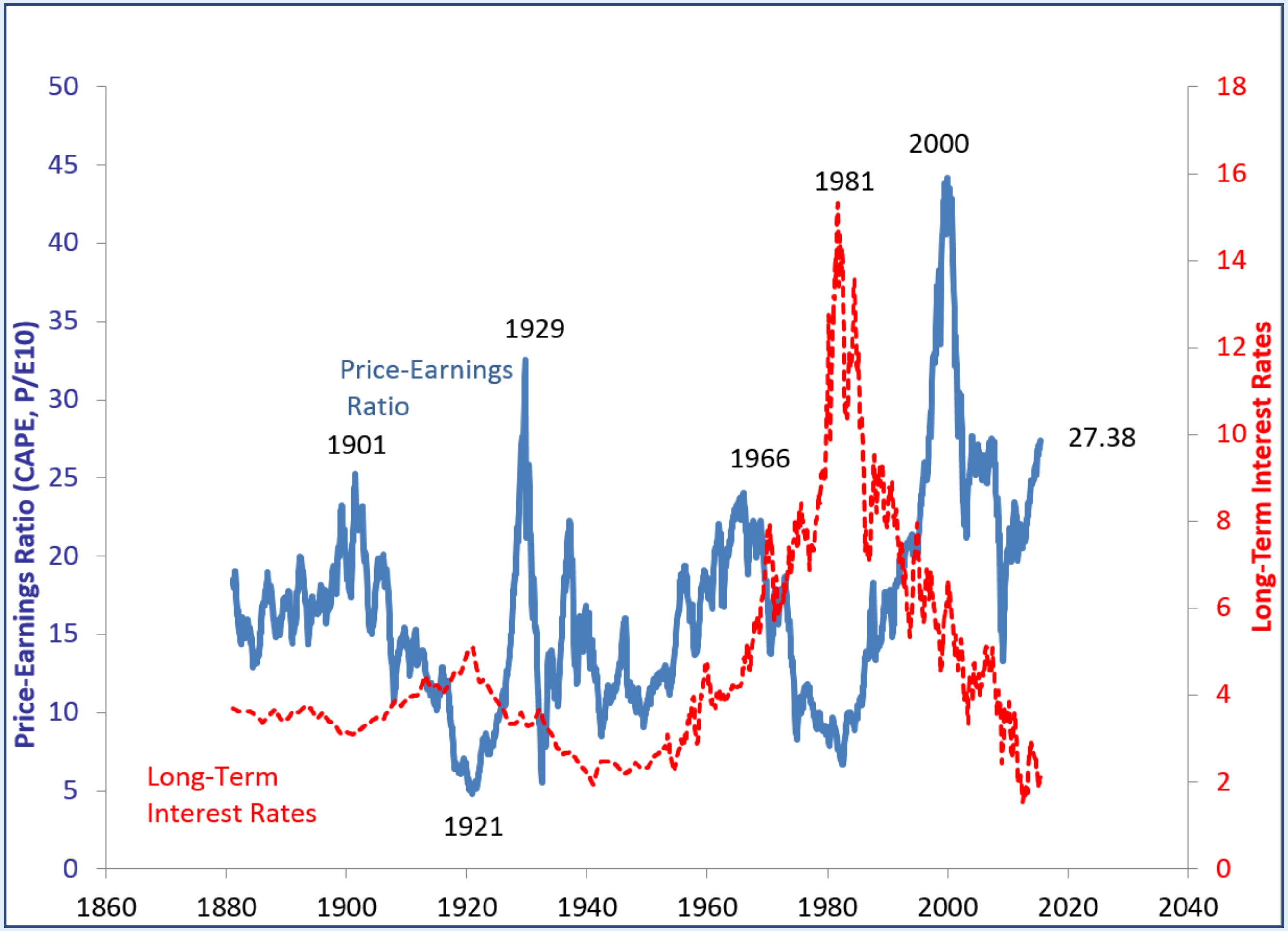
Additions:

- End of depression scare
- Extremely loose monetary policy and QE1, QE2, QE3
- New end-of-career anxieties with stellar advance in information technology
- Public attention drawn to income inequality

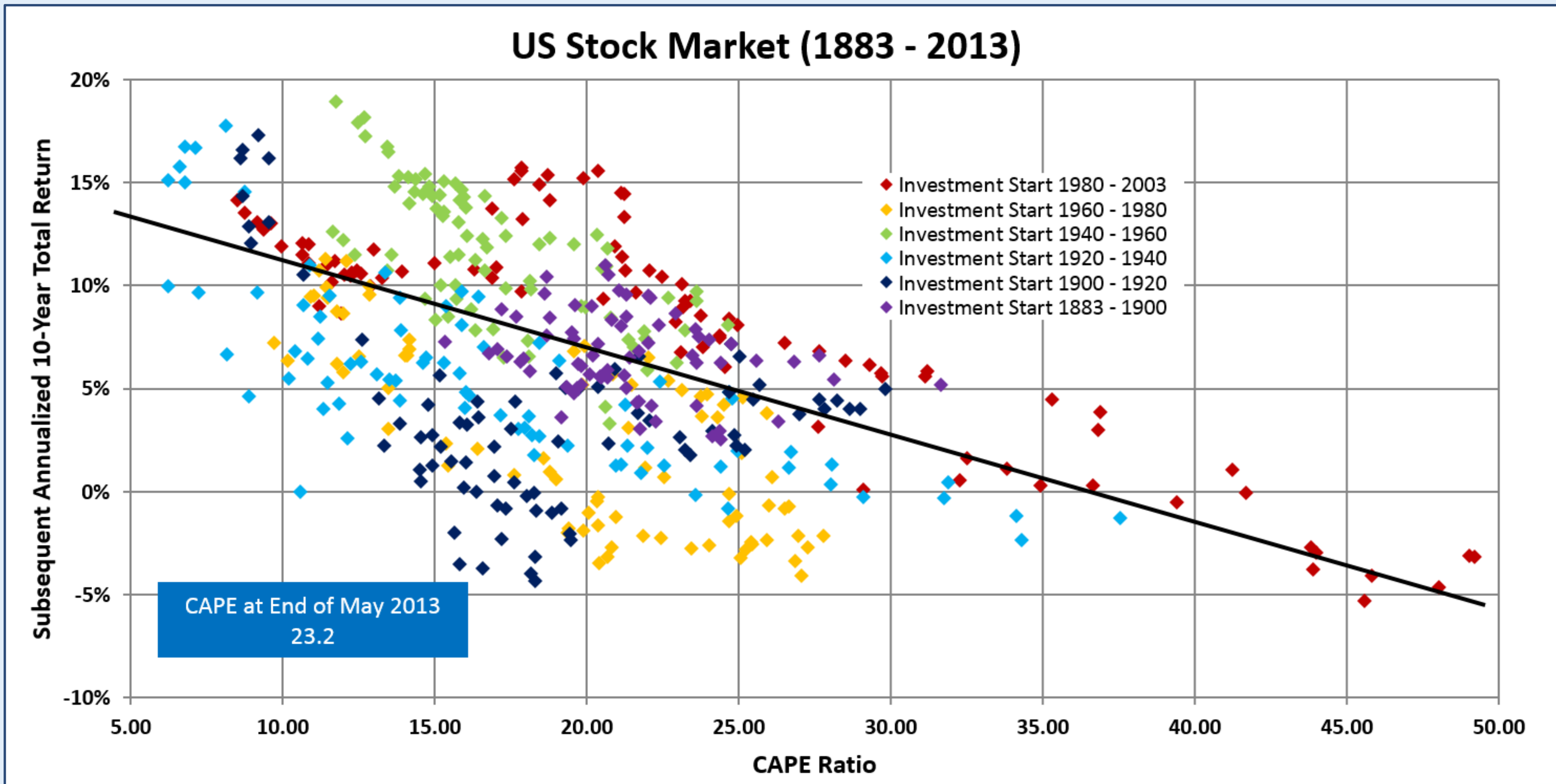
Deletions:

- Democratic Congress disappears: Republicans take House 2008 in and Senate in 2014

U.S. Cyclically Adjusted Price Earnings Ratio 1881 - May 21, 2015

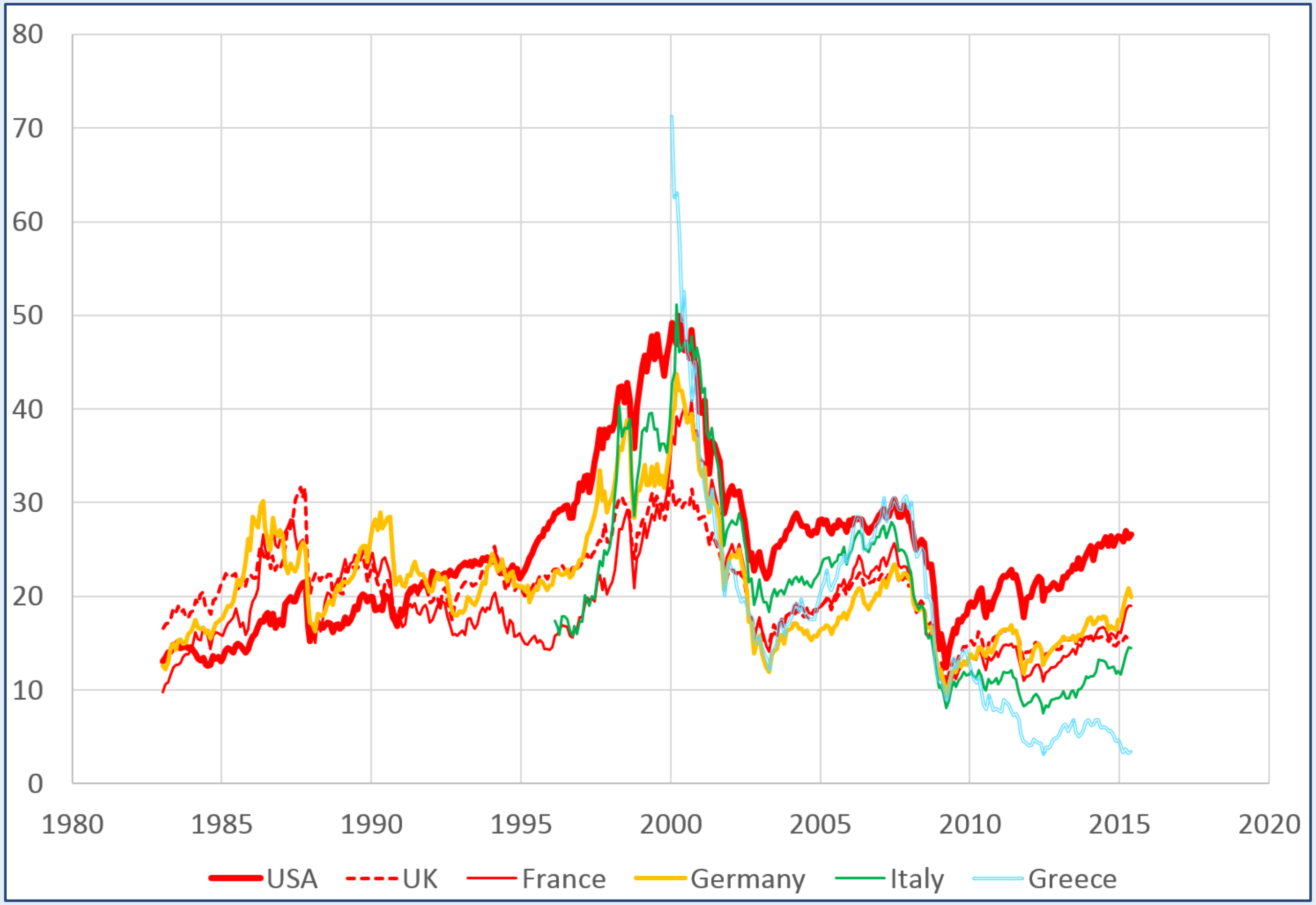


Campbell-Shiller Cyclically-Adjusted Price Earnings Ratio Predicts U.S. Stock Market Annualized Ten-Year Return

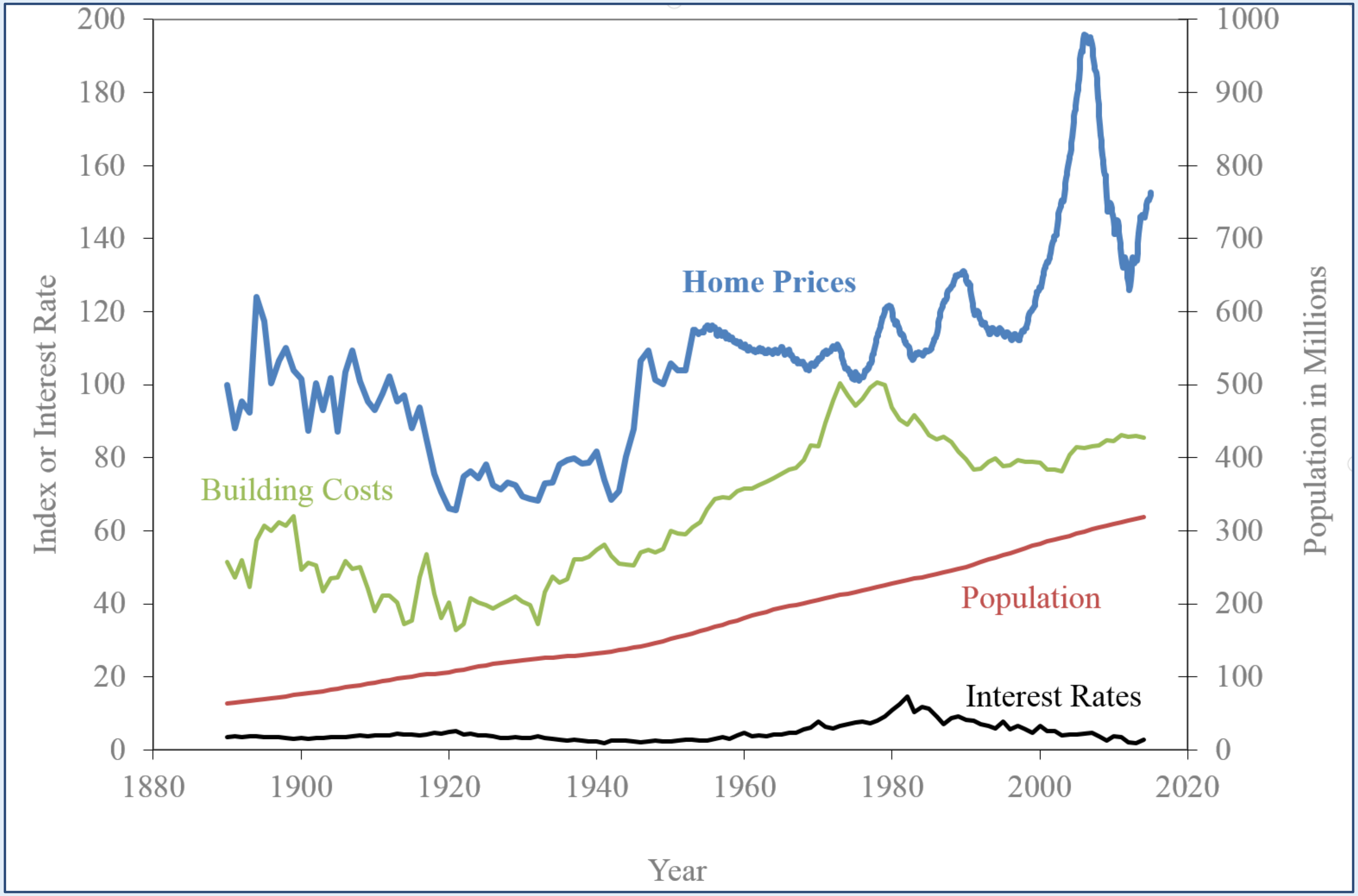


CAPE is Not Everywhere So Overpriced 1983-2015

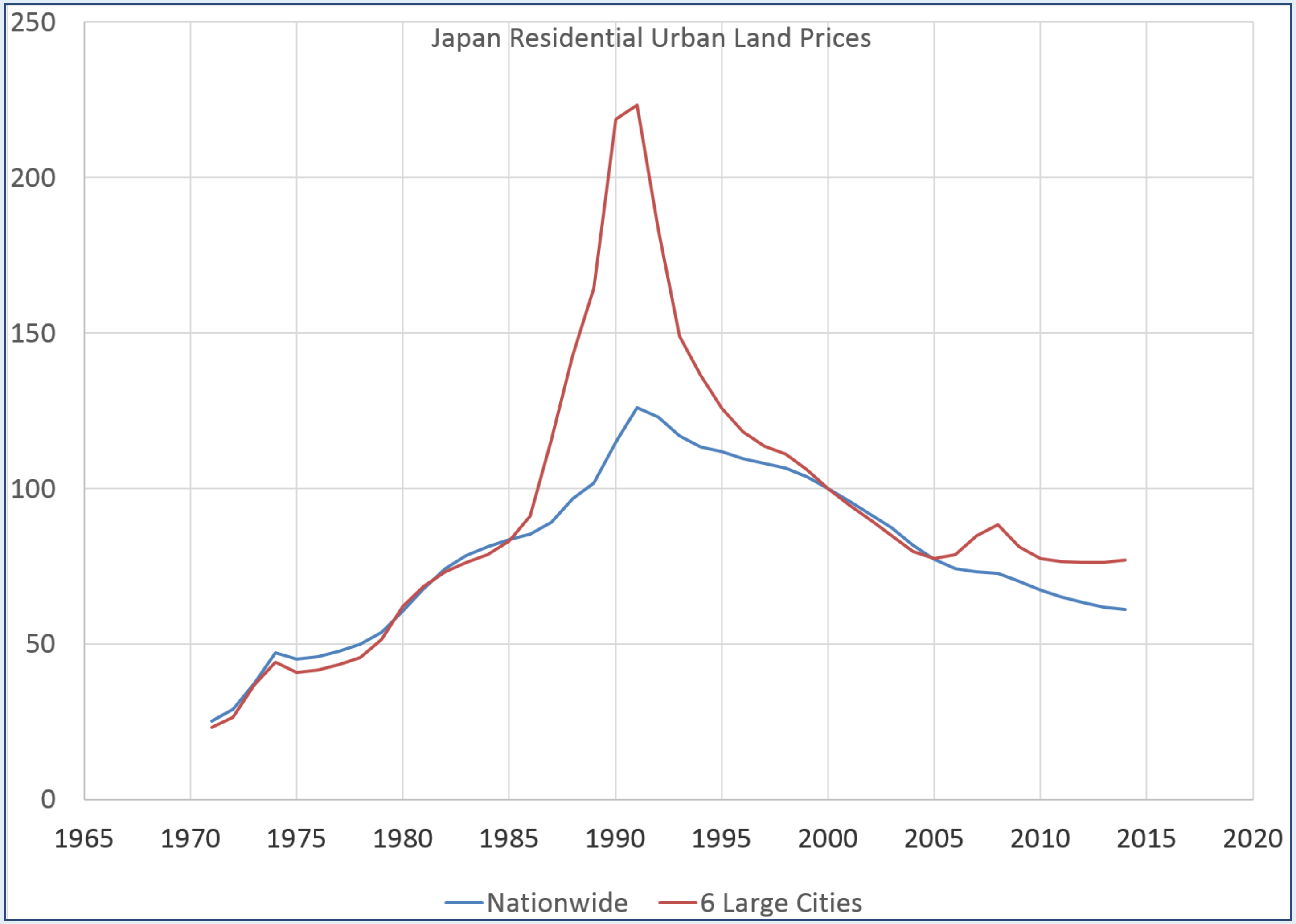
CAPE: U.S. and European Countries Compared: Jan 1983 - May 2015



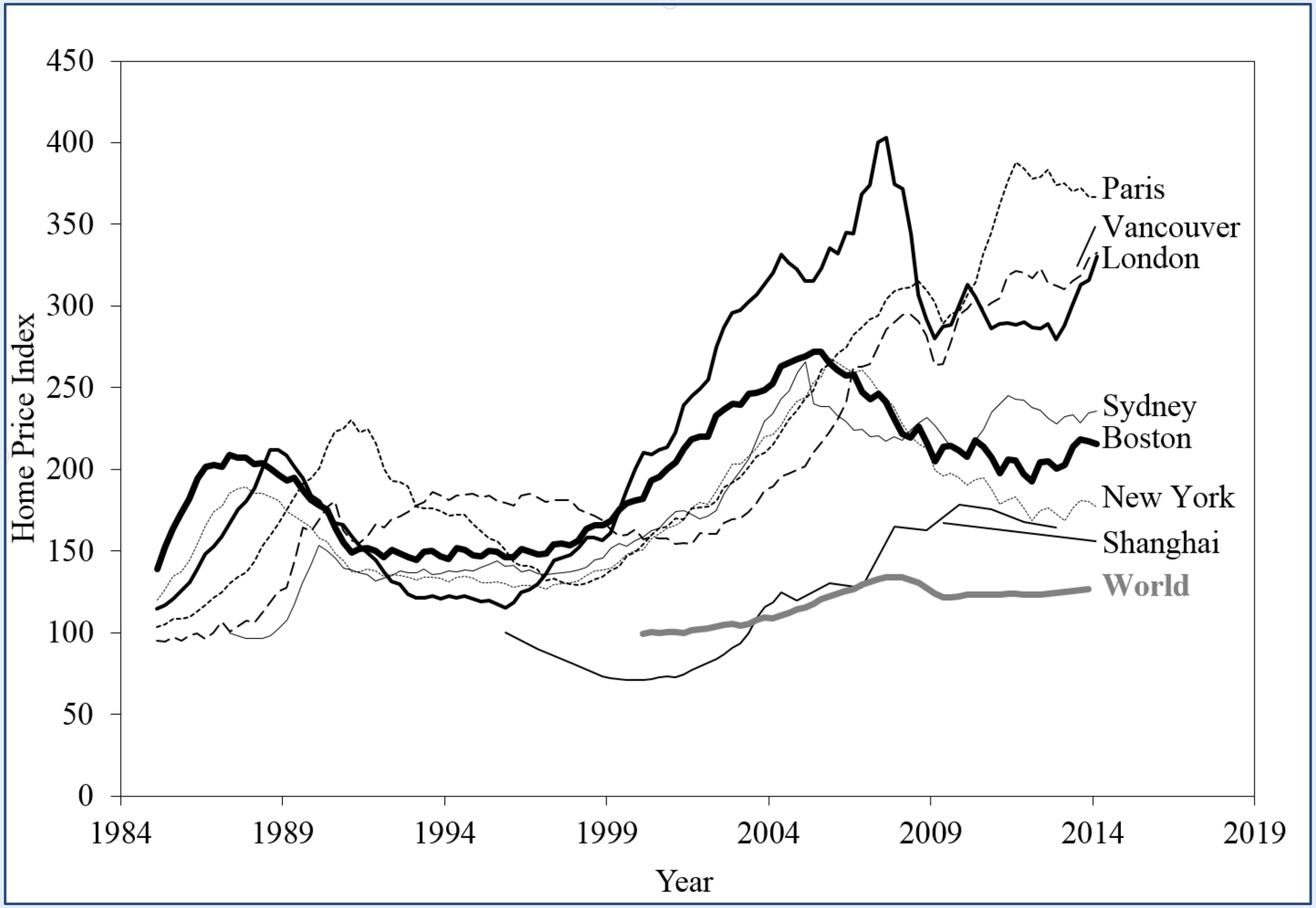
U.S. Home Prices and Fundamentals 1890-2015



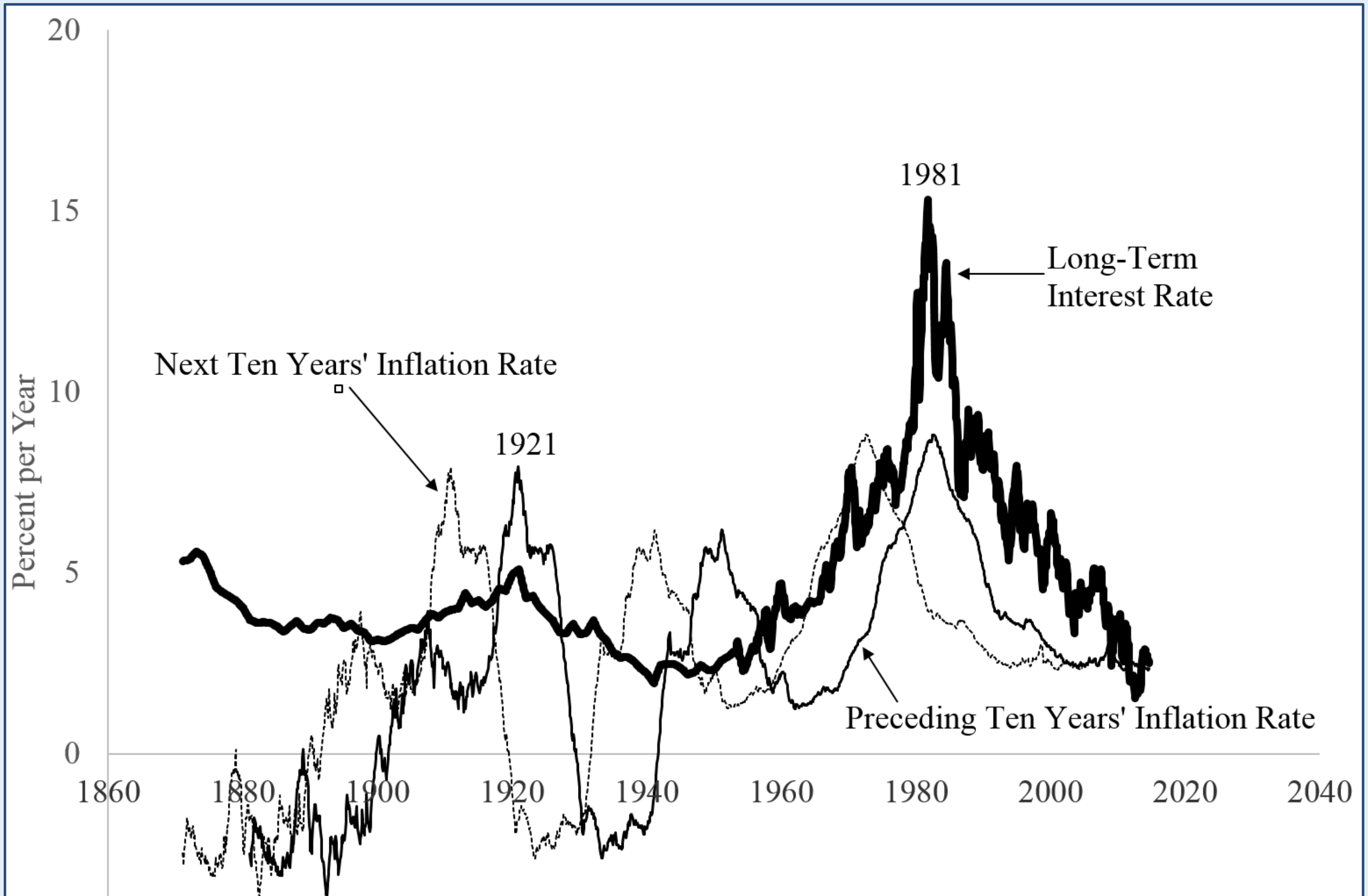
In Japan, Despite Extremely Low Long Rates, Home Prices Stay Low



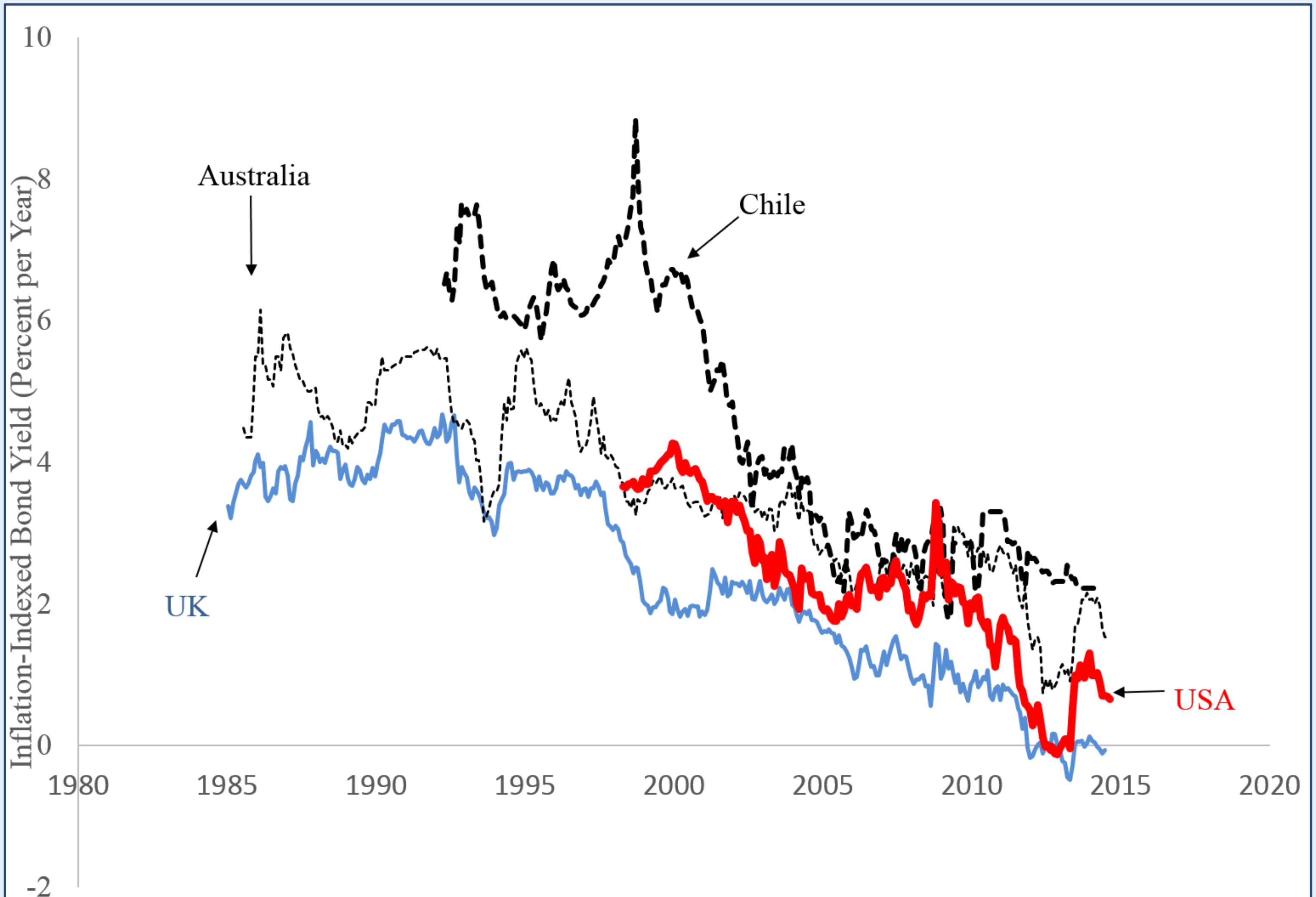
IMF Real World Home Price Index
(Bottom Thick Gray Line)
Is High but Not Super High



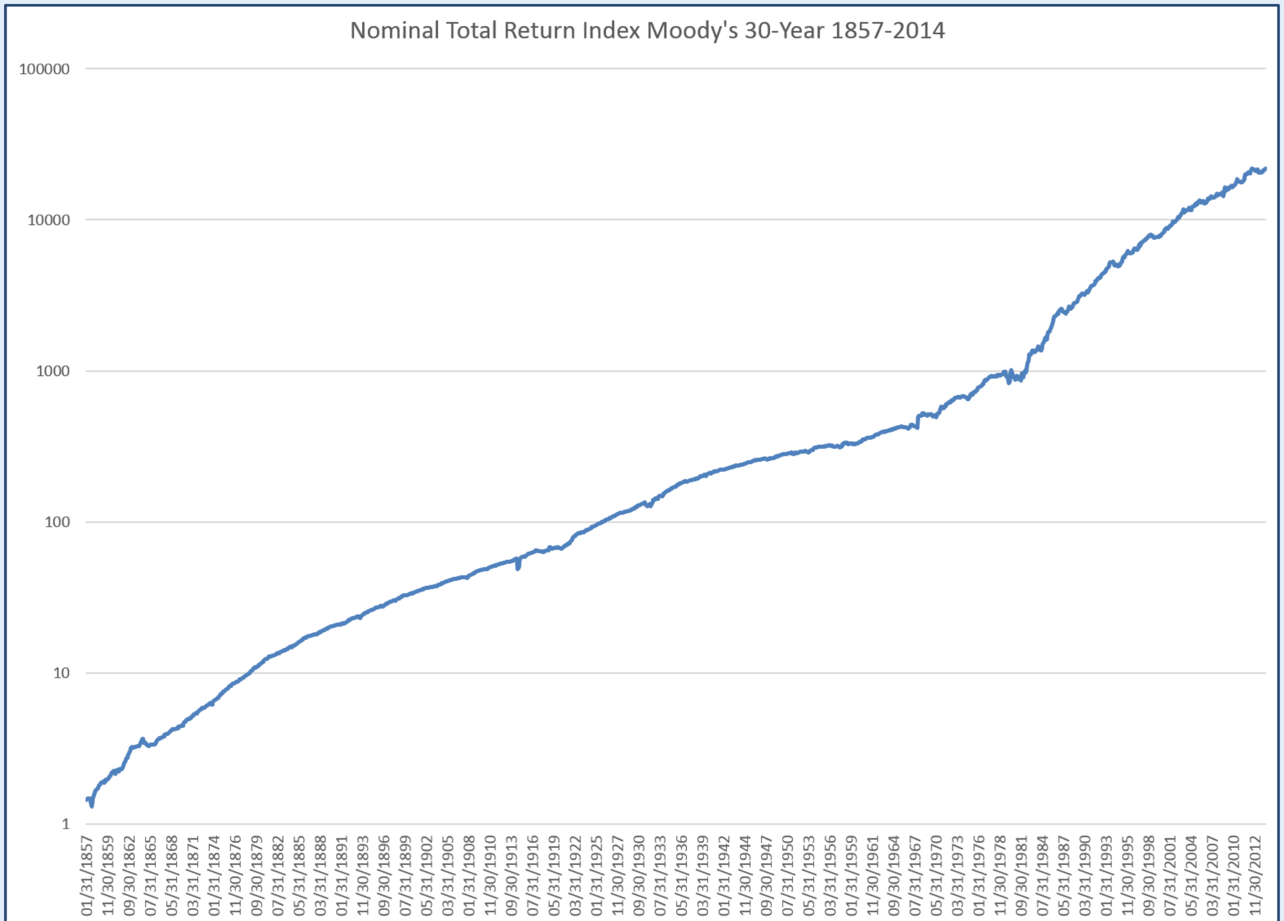
U.S. Long-Term Interest Rate and Ten-Year Inflation Rate - Led and Lagged



Inflation-Indexed Long-Term Bond Yields for Four Countries



There Has Never Been a Sharp Bond Market Crash in the U.S.
Moody's Long-Term Bond Total Return Index



Is the Term "**Irrational Exuberance**" Still as Apt in Describing **New Normal Boom?**

Pro:

- Excitement about price growth in the bond market, stock market, housing market, must play a role
- The phrase "irrational exuberance," coined on Wall Street nearly a century ago, is a description of basic human nature
- The precipitating factors change but the feedback mechanism is enduring.

Con:

- There is an atmosphere of fear, brought on by inequality, high technology, instead of euphoria (Like an LSD high rather than an Ecstasy high)
- Could some investors be so naïve as to think that bond market capital gains will continue indefinitely?