Lessons from the Financial Crisis and Its Impact on Higher Education, Innovation and Technology

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Outline

- Financial crisis
  - Global imbalances
  - Shadow banking
  - Some lessons

- Innovation and technology
- Higher education

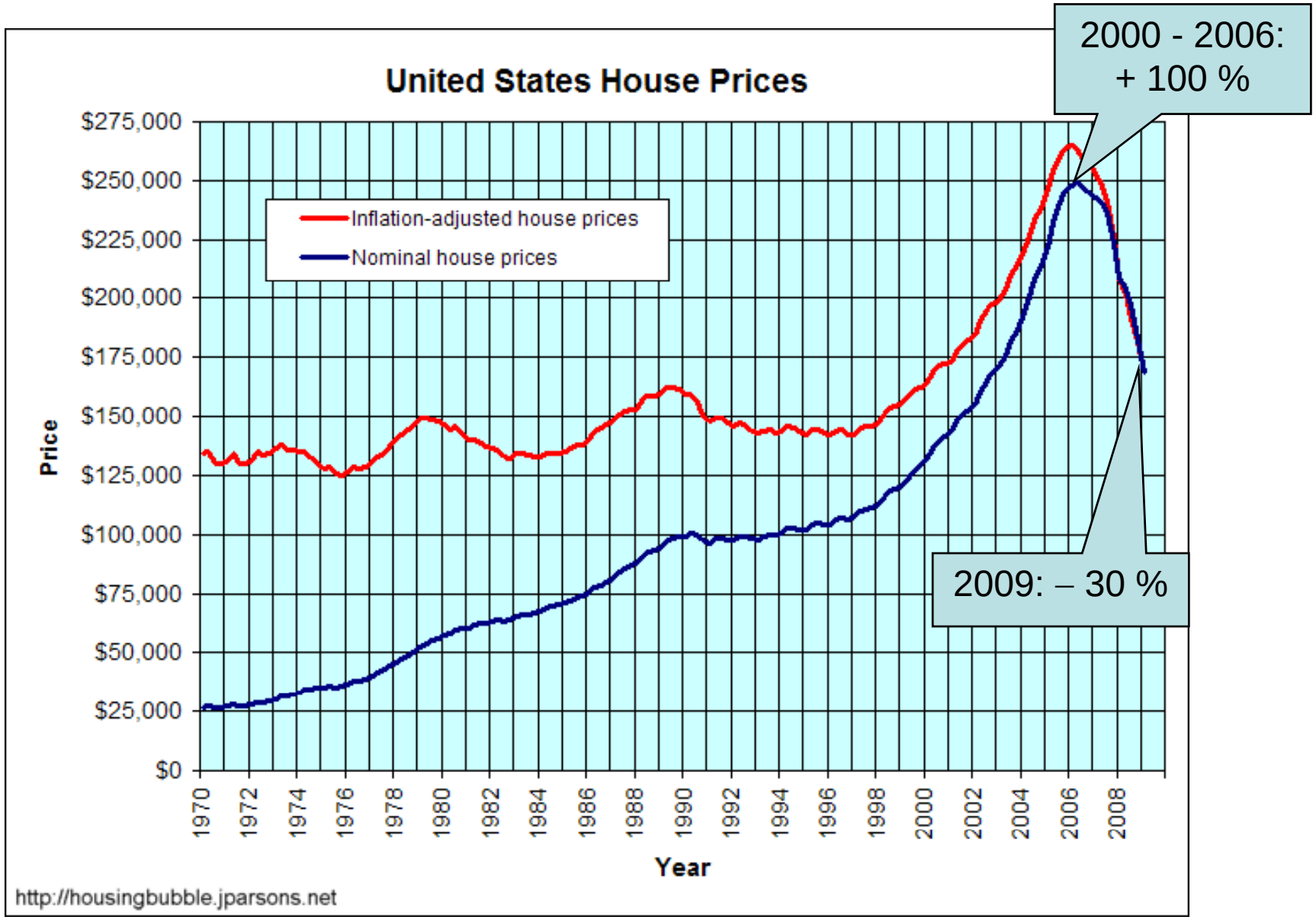
Financial crisis

The “Quiet period”: 70 yrs without banking panics in the U.S.

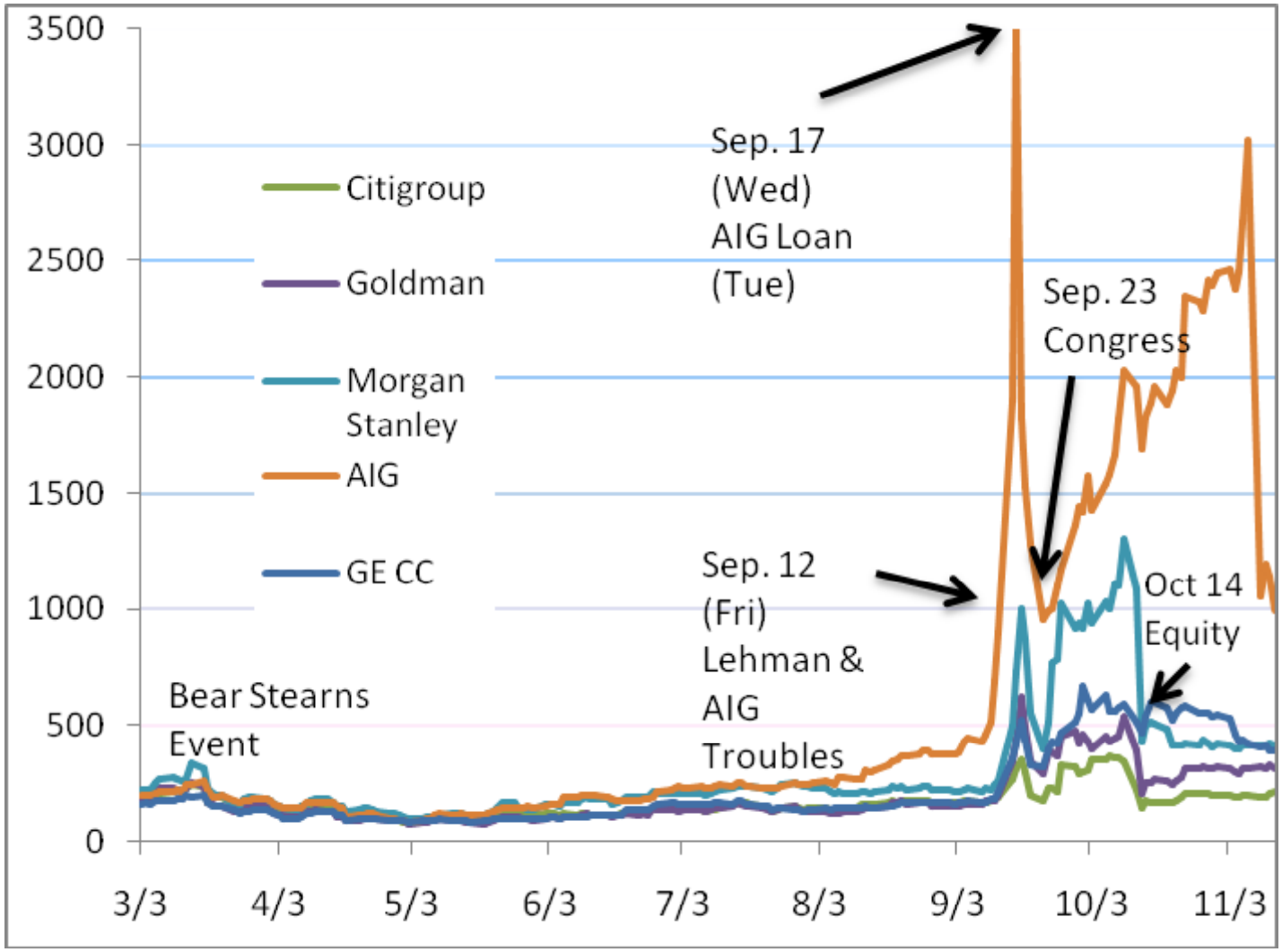
Source: Banking and Monetary Statistics and FDIC.

From Gorton-Metrick (2009)

Real estate bubble and bust



The result: A modern bank run



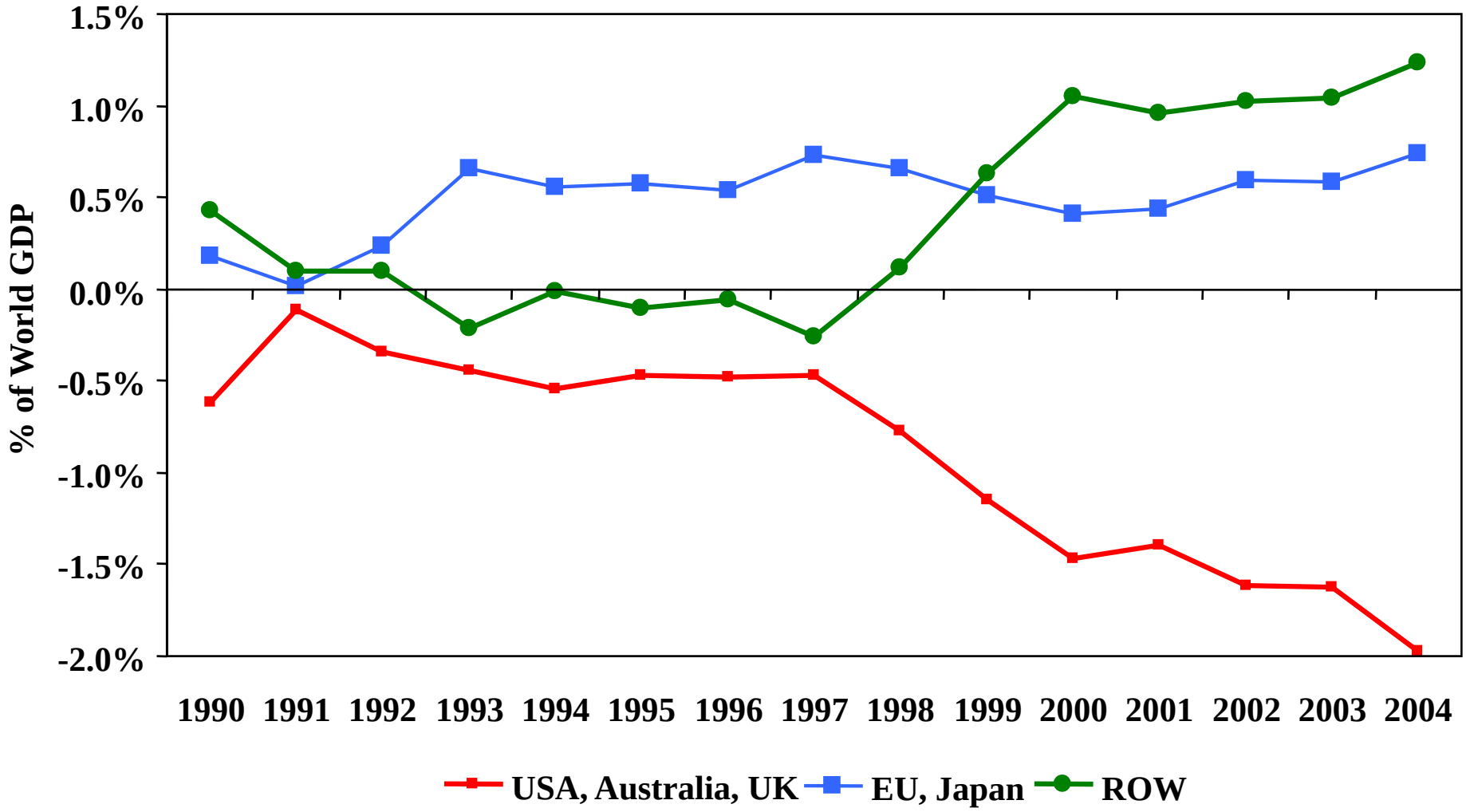
Source: Datastream

Who to blame?

- Wall Street greed, incentives
- Reckless lending, subprime
- Securitization, non-transparent
- Rating agents, flawed models

- We need less blame, more analysis
- What were the underlying drivers?

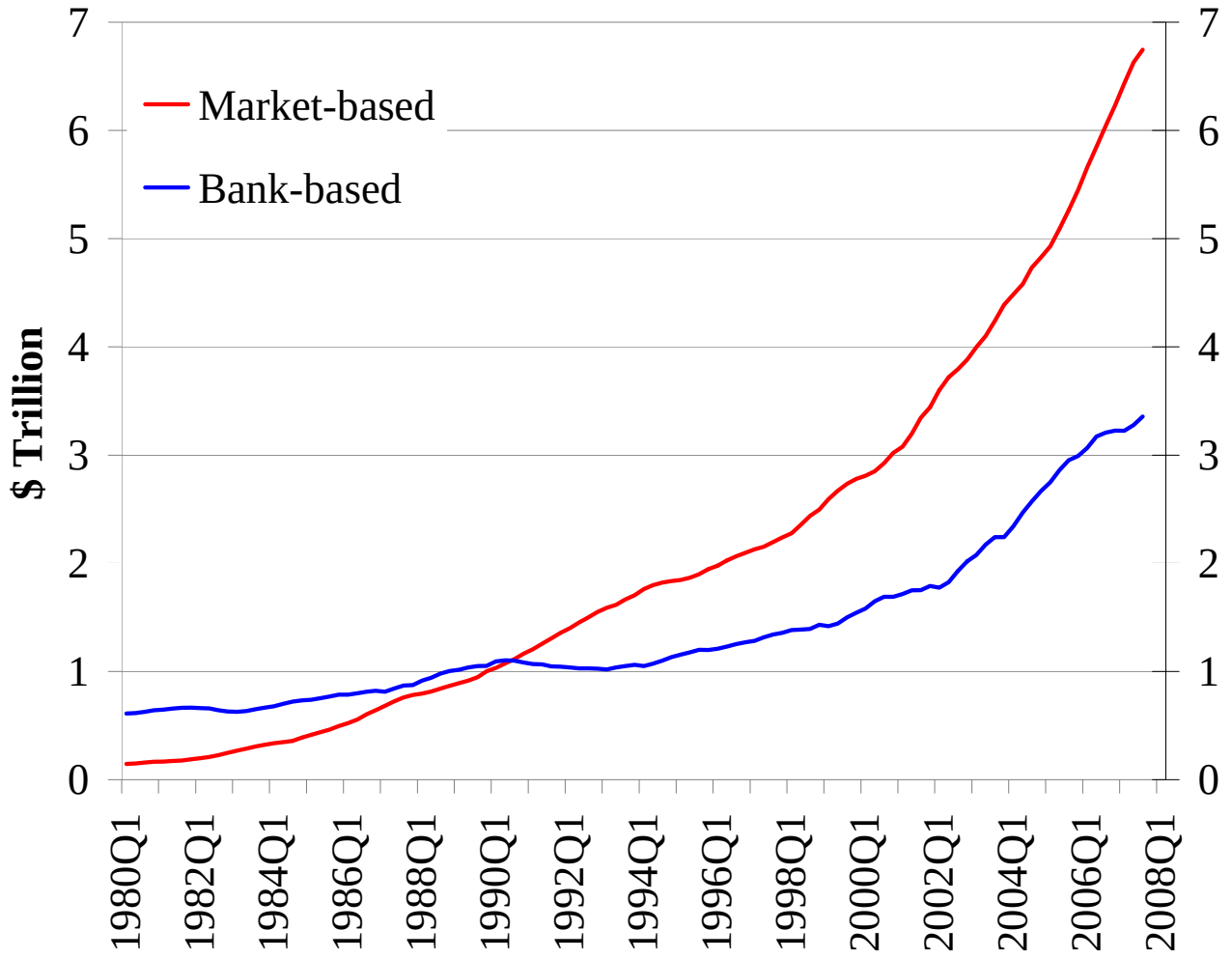
Global imbalances



Global savings glut meets political desire for broader home ownership

- Increased foreign demand for savings led to massive amounts of money looking for “parking space”
- Old dream: political desire for increased home ownership for low-income people (Freddie Mac and Fannie Mae)
- Wall Street’s response: create more parking space
  - New lending/housing (subprime, but government subsidized)
  - Home equity loans
- The vehicle: Shadow banking

Led to rise of shadow banking – especially in mortgage funding

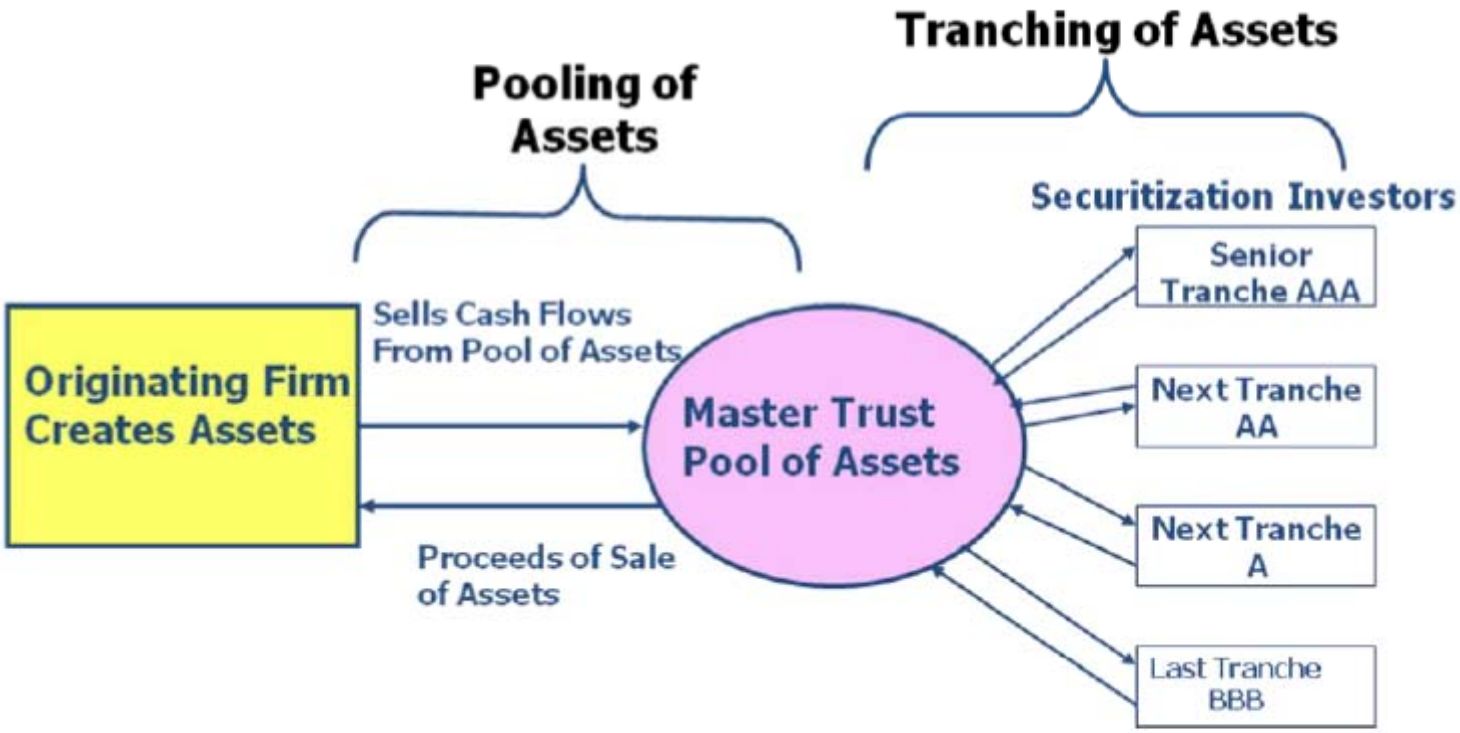


Adrian-Shin (2009)

Shadow banking

- Investment banks (Lehman, Bear Sterns, etc) and GSEs (Fannie and Freddie)
- Funded in wholesale market (repo)
- Collateral used to secure big loans
- Largely unregulated; huge leverage
- Grew very fast. Absorbed most of increase in liquidity

Securitization



Gary Gorton (2009)

Tranching of Asset Pool

Bond Tranches	Thickness	“Loss Support”
AAA	80%	20%
AA	5%	15%
A	5%	10%
BBB+	2%	8%
BBB	1%	7%
BBB-	2%	5%
BB	1%	4%
Overcollateralization (Equity)	4%	0%

Potential risks

- High leverage
  - Commercial banking system 1:10
  - Shadow banking system 1:30
- Relied increasingly on short-term money
  - Overnight funding (repos) rose from 15% to 25% after 2004
- “Deposit insurance” relied on liquid secondary market for collateral

What about lack of transparency?

- Nothing transparent about traditional banks
  - No mark to market
- De Beers and diamonds: customers aren't allowed to inspect quality
- Liquidity = symmetric information about payoffs
- Scandinavian 90-91crisis happened without any securitization

Nature of liquidity provision

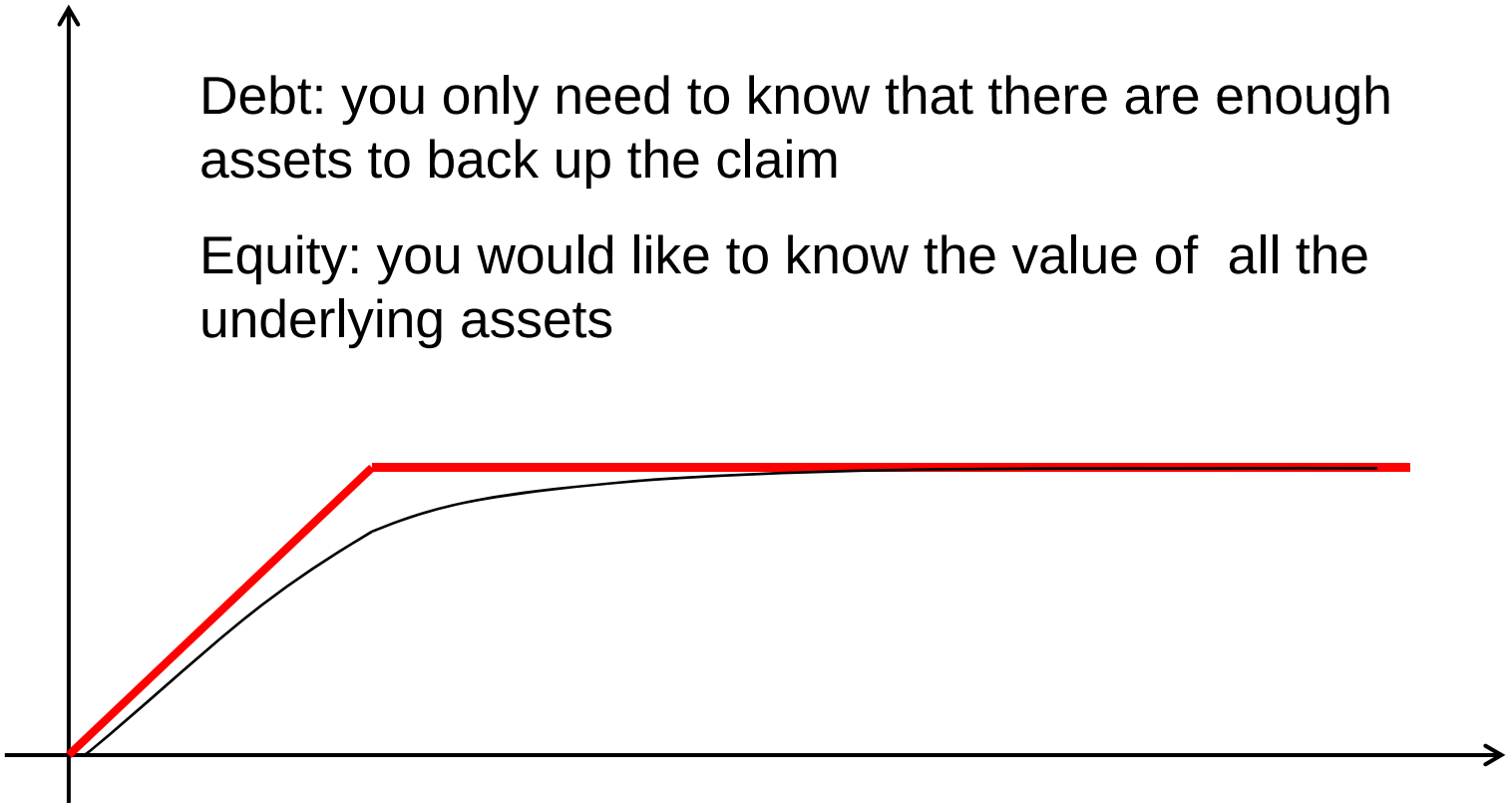
- High velocity markets
  - No time to evaluate creditworthiness

  =>
- Information insensitive instruments = Debt
  - Low volatility of underlying assets (mortgages, securitization)
  - Coarse ratings
  - Over-capitalized

Debt and information sensitivity

Debt: you only need to know that there are enough assets to back up the claim

Equity: you would like to know the value of all the underlying assets



information sensitive

information insensitive

The good and the bad of low transparency

- Securitization increased liquidity:
  - Eliminated idiosyncratic risk (low asset volatility)
  - Eliminated adverse selection (low transparency)

….but

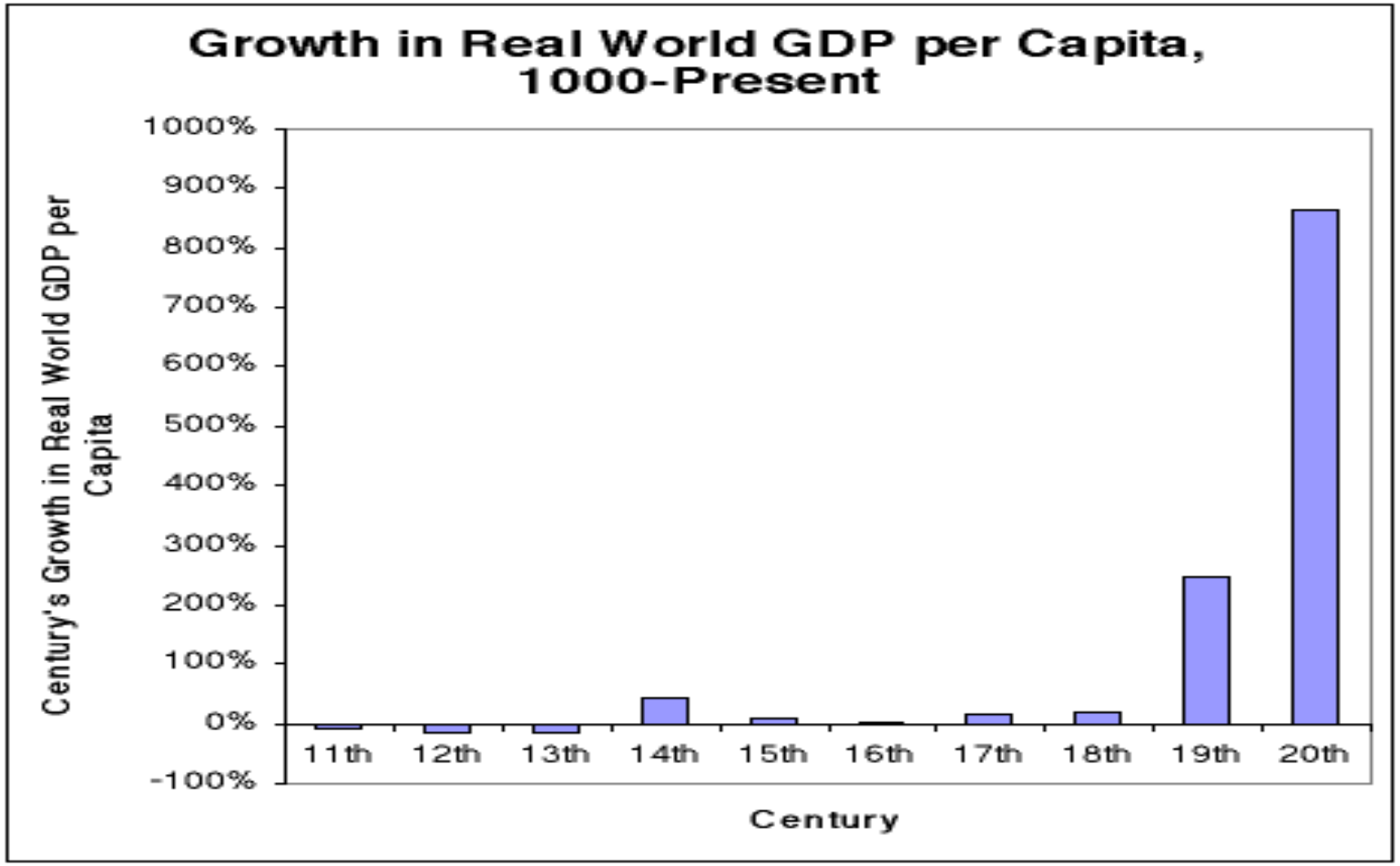
- Its Achilles heel: systemic risk
  - Information about risk not produced (unlike stock mkt)
  - Excessive since risk unpriced (unlike stock market)

Assessment

- Massive global savings got largely absorbed by U.S. shadow banking
- No danger for U.S. external debt, but caused havoc for financial intermediation within
- Shadow banking reliant on liquid markets
- Bank run occurred when markets froze on suspicions over subprime related products
- Could this have been avoided?
- Market liquidity remains a problem; the Quiet period may be over

Innovation and technology

Innovation is (almost) everything in growth



Does crisis spur innovation?

- Historical facts:
  - Well over one half of 2009 Fortune 500 companies were born in a recession or bear market (stocks down
  - About half of 2008 Inc list
- Examples: Intel, AMD, Charles Schwab, Microsoft
- Nokia re-born in the midst of the Finnish “depression” 1991-93

Why would that be?

- One reason: CEOs of companies born in recessions are *more conservative*
- Second reason: “the prospect of hanging clarifies the mind” – strong incentives to come up with ideas in crisis

Too much resources can hurt

- Jeff Bezos, Amazon CEO: “We have never invented anything of value when we had enough money and time.” (paraphrased)
- Many high-spending, large companies have had problems with innovation (Microsoft, Intel, Nokia,…) – hard to do two things at the same time.
- Biotech industry – a great disappointment so far. Barely any discoveries in return for huge investments; free-spending research-style changing with credit crunch – for better??

The importance of constraints

- Deng Xiaoping, Chinese premier: “Frame the forest and let the trees grow”
- Steve Jobs – brilliant at setting stretch goals and specs… and then sticking to them. Totally uncompromising

Innovation much more than technology

- Intangible innovations (and patents) growing in importance:
  - Making money on the Internet – Google's advertising based business model
  - The value of User Interface – Amazon.com's continuous investments (e.g. one-click feature)
  - New business models – Harrah's use of data
- Complementary investments very important
  - Financial crisis not a technological problem
  - IT productivity critically dependent on investments in human capital

IT complementarities

IT Capital (10%)

Technological Complements (15%)

Organizational Assets (75%) (human capital, business processes, culture)

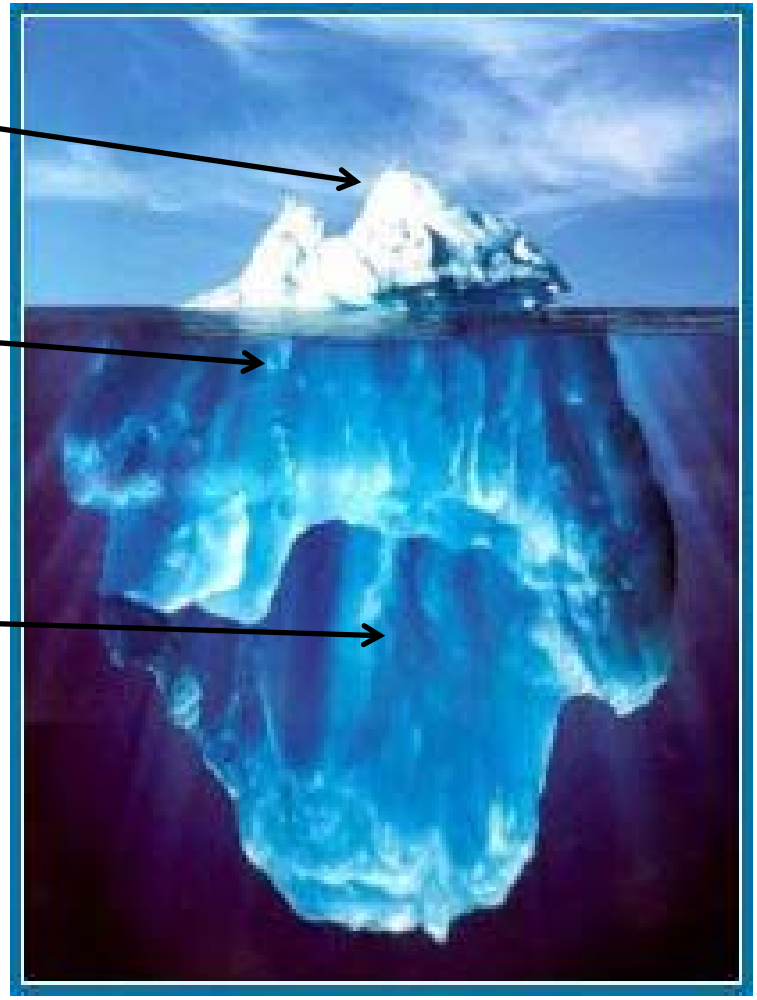


Image by Ralph Clevenger

Erik_Brynjolfsson, MIT

Higher education

Why is research increasingly specialized?

- Peer review based refereeing, promotions evaluations foster inbreeding – probably true whether specialized or multi-disciplinary

- Specialization essential for radically new innovations
  - Nokia story: relied largely on novel radio technology conceived in the “ivory tower”
  - But; MS, Google rather different

Is higher education in need of radical reform?

- Global problems – financial system, energy, warming, water, poverty,… globalization itself – demand problem oriented, multi-disciplinary efforts
- The nature of innovation broadening
- Marc Taylor, Columbia: “Graduate education in the US is the Detroit of higher education.”
- Paul Krugman, Nobel laureate: Narrow economics partly responsible for crisis
- MBA curriculum changing becoming more holistic – human values included

Aalto University

- Helsinki University of Technology + Helsinki School of Business + University of Art and Design
- Ambition: be something more than “just another good university”: interdisciplinary, interactive, international
- Industry’s hope: maintain Finland’s competitiveness through innovative research and excellence in teaching

Interdisciplinary approach at Aalto

- Engage all parties: students, faculty, industry – but especially students
- Experiment with innovative “business models” for simultaneous teaching and research:
  - Design Factory, Service Factory, Media Factory
- Expand cross-disciplinary teaching programs (International MBA)
- Give students more choice: force them into sufficiently broad education

But: don’t forget basic research

- Basic research the foundation for all top U.S. research universities
- Basic research has played a key role in the Fed’s highly innovative approach to solving the financial crisis – also for interpreting it
- Basic research cannot be steered from the top down – choosing the right people to bet on as important as choosing the right subject
- But: Man on the Moon very successful

Conclusion: The key challenges

- Financial crisis:
  - how to measure systemic risk
  - how to handle global imbalances
- For innovation and technology:
  - how to innovate in the intangible space
  - how to handle complementarities
- For higher education:
  - how to find the right balance between basic and applied research.
  - how to be interdisciplinary without losing discipline