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

2000 - 2006: + 100 %

2009: − 30 %
The result: A modern bank run
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

1.0% 0.5% 0.0% -0.5% -1.0% -1.5% -2.0%


% of World GDP

USA, Australia, UK  EU, Japan  ROW
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

<table>
<thead>
<tr>
<th>Bond Tranches</th>
<th>Thickness</th>
<th>“Loss Support”</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>80%</td>
<td>20%</td>
</tr>
<tr>
<td>AA</td>
<td>5%</td>
<td>15%</td>
</tr>
<tr>
<td>A</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>BBB+</td>
<td>2%</td>
<td>8%</td>
</tr>
<tr>
<td>BBB</td>
<td>1%</td>
<td>7%</td>
</tr>
<tr>
<td>BBB-</td>
<td>2%</td>
<td>5%</td>
</tr>
<tr>
<td>BB</td>
<td>1%</td>
<td>4%</td>
</tr>
<tr>
<td>Overcollateralization (Equity)</td>
<td>4%</td>
<td>0%</td>
</tr>
</tbody>
</table>
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 90-91 crisis 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.
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)

Erik_Brynjolfsson, MIT

Image by Ralph Clevenger
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