



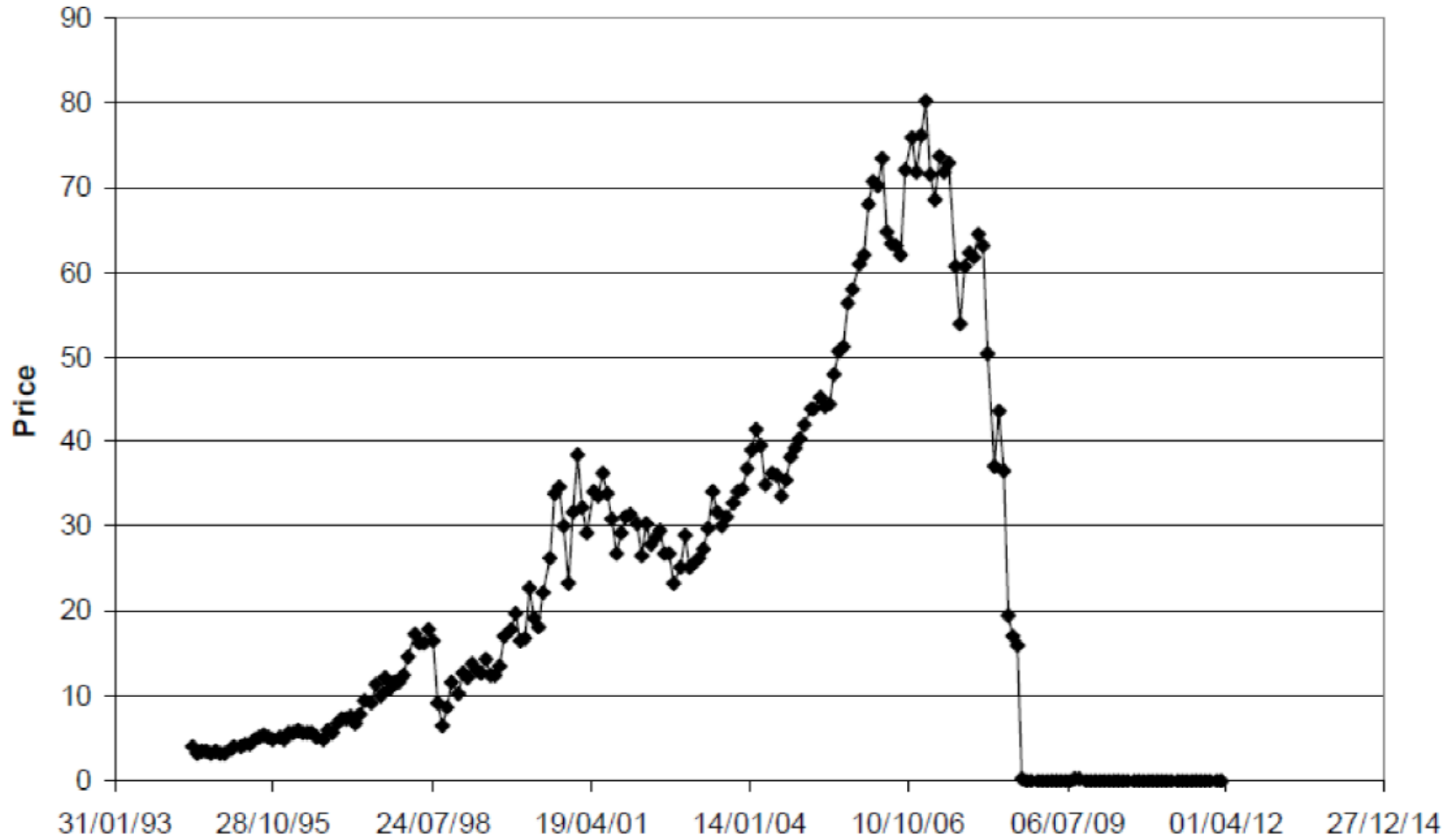
NÁRODNÁ BANKA SLOVENSKA  
EUROSYSTEM



# Ten Years after Lehman: What has Changed?

Ludovit Odor, Deputy Governor

# Lehman's stock price



Source: Remorov (2014), p. 24. Used source: Bloomberg

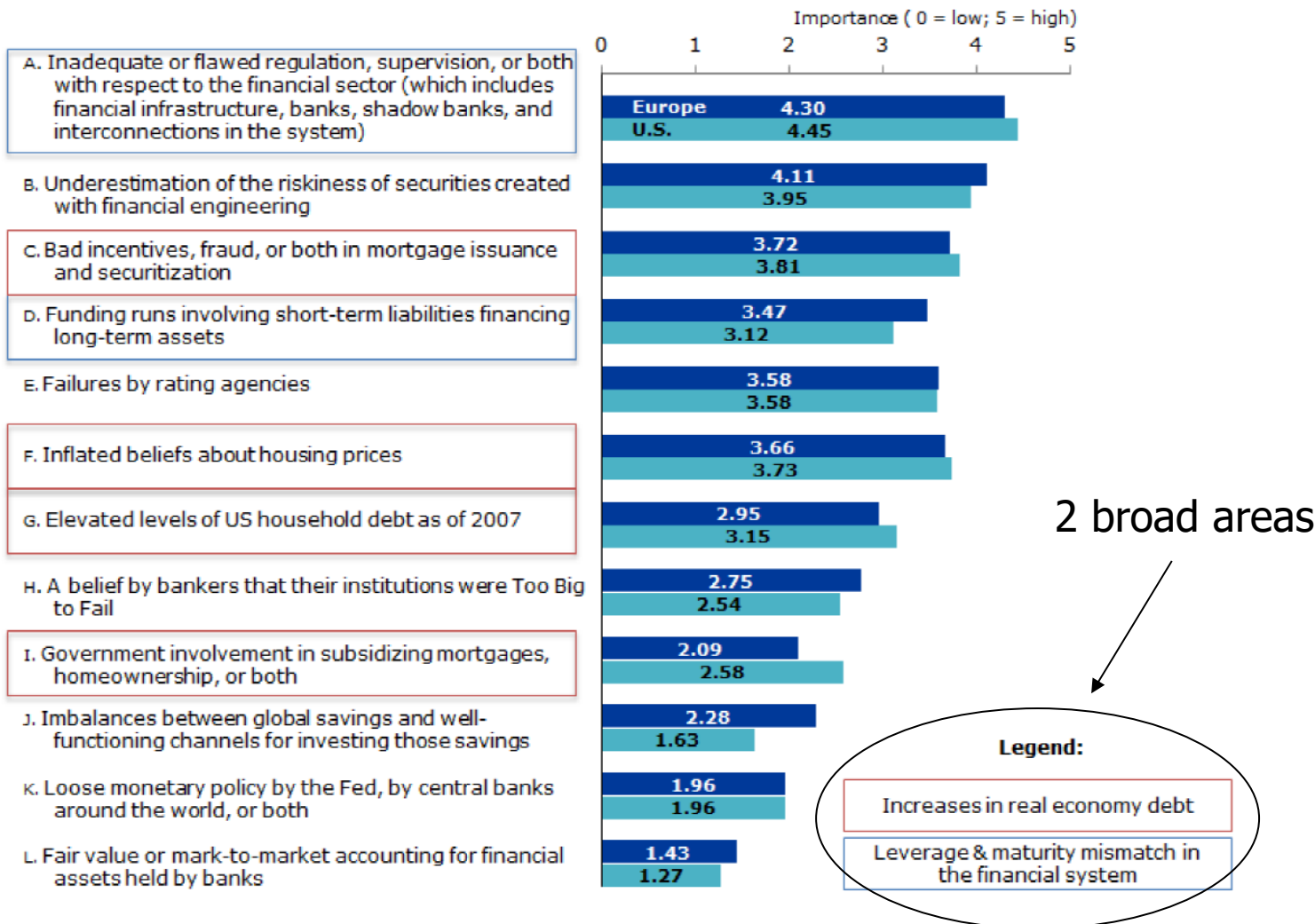


- **The story in hindsight**
- **Two questions**
- **Policy responses**
- **What has changed?**
- **Remaining challenges**



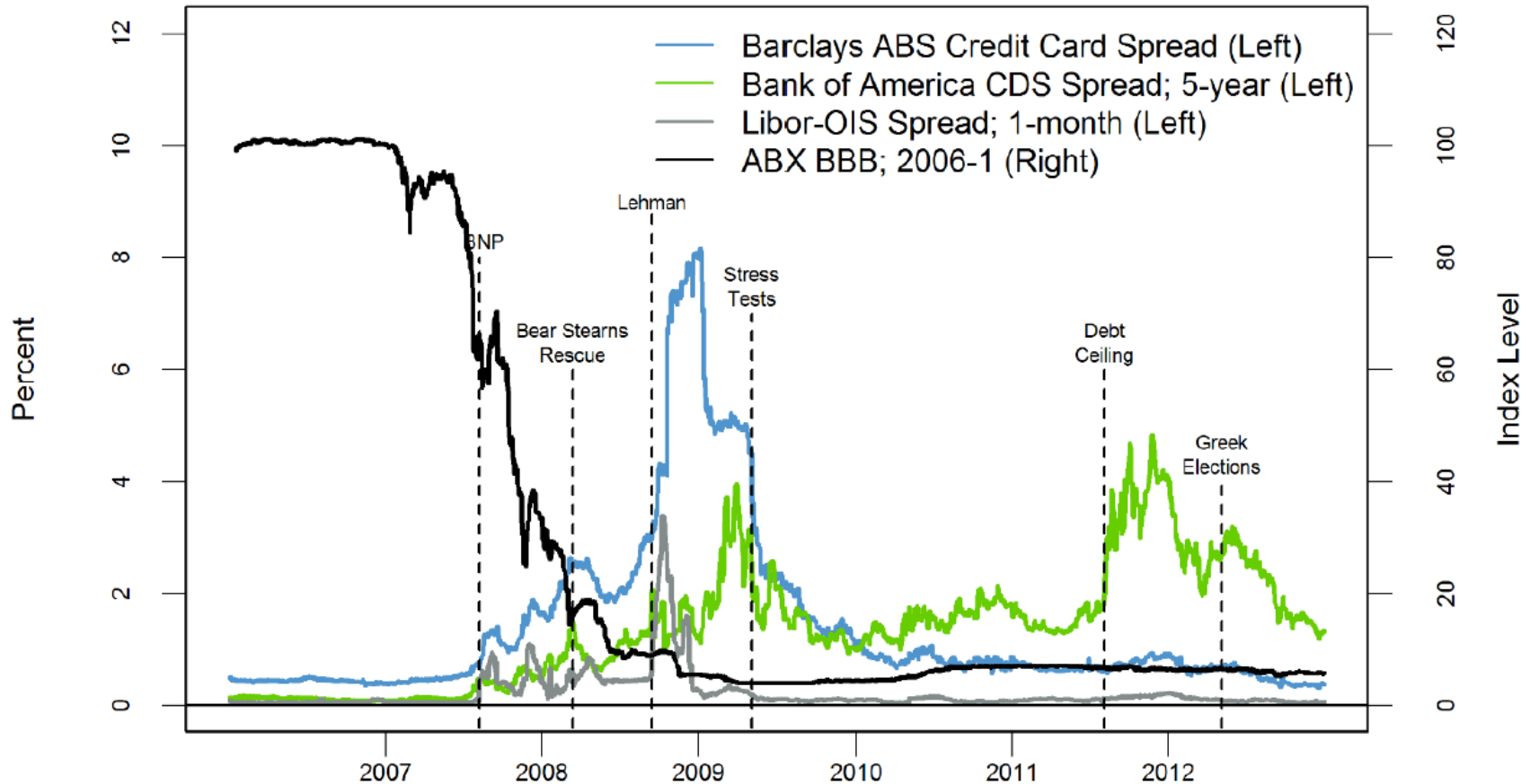
# **The story in hindsight**

# No single cause



Source: Chicago Booth Initiative on Global Markets ([igmchicago.org](http://igmchicago.org)). Survey of academic economists in the United States and Europe, conducted in 2017. Answers are weighted by respondents' stated confidence. On the European panel, 37 of 49 panelists responded. On the US panel, 37 of 42 panelists responded.

# Four stages (1)



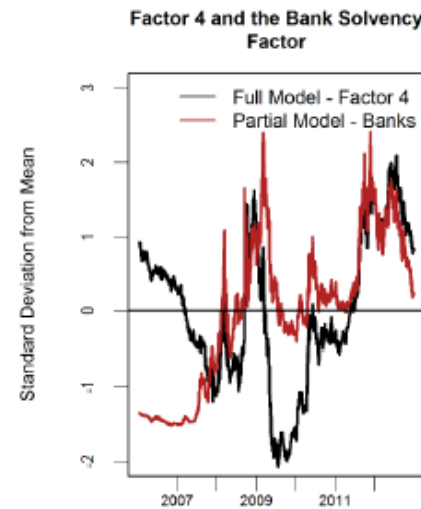
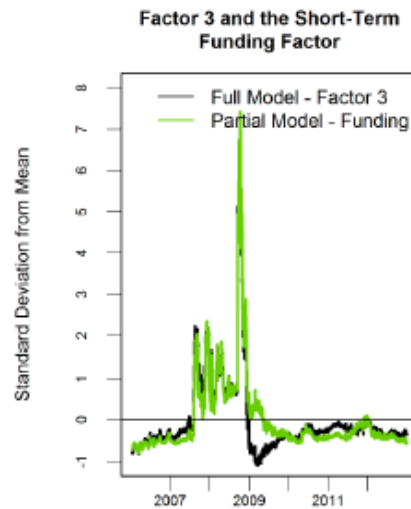
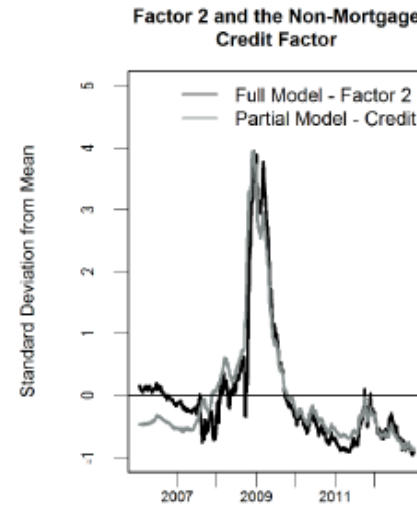
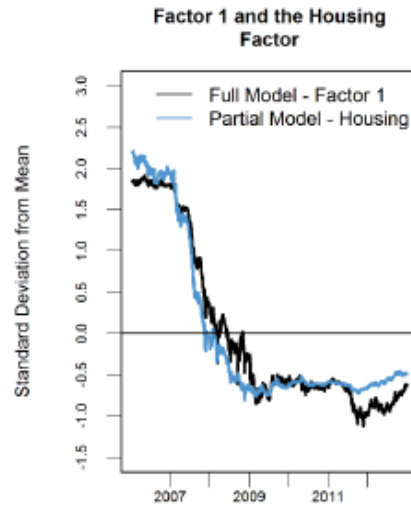
Source: Bernanke (2018)

# Four stages (2)



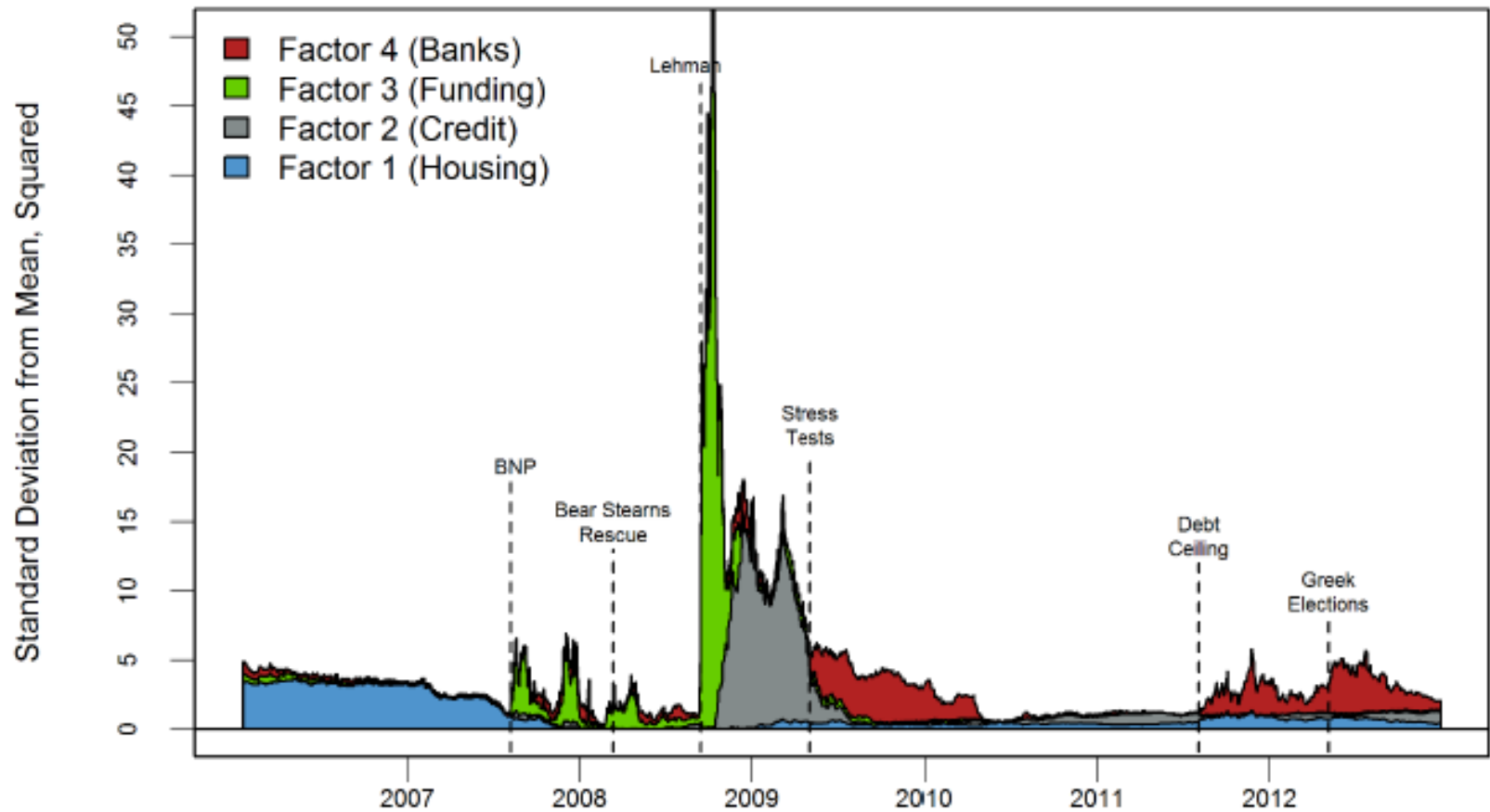
- **Stage 1 – Bursting of the housing bubble, concerns about the (subprime) mortgage market**
- **Stage 2 – Liquidity pressures, funding problems**
- **Stage 3 – „Run on Repo“, higher spreads on non-mortgage credits, panic**
- **Stage 4 – Bank solvency issues, higher probability of defaults**

# Four stages (3)



Source: Bernanke (2018)

# Four stages (4)



Source: Bernanke (2018)



# Two questions



**“Why did no one see it coming?”**

*Queen Elizabeth II*

**„Federal Reserve forecasts significantly under-predicted the rise in unemployment in 2009, even in scenarios designed to reflect extreme financial stress.“**

*Ben Bernanke*

# Why so unexpected?

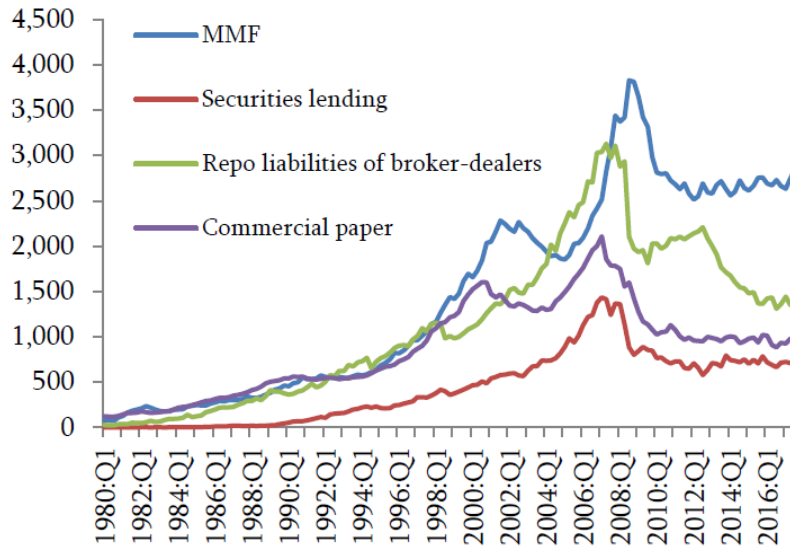


- **Great Moderation (confidence in policy)**
- **Global savings glut**
- **Shadow banking outside the scope of regulation**
- **Underestimated correlation of risks**
- **Interconnectedness, network effects**
- **Not well understood financial engineering**

# Shadow banking



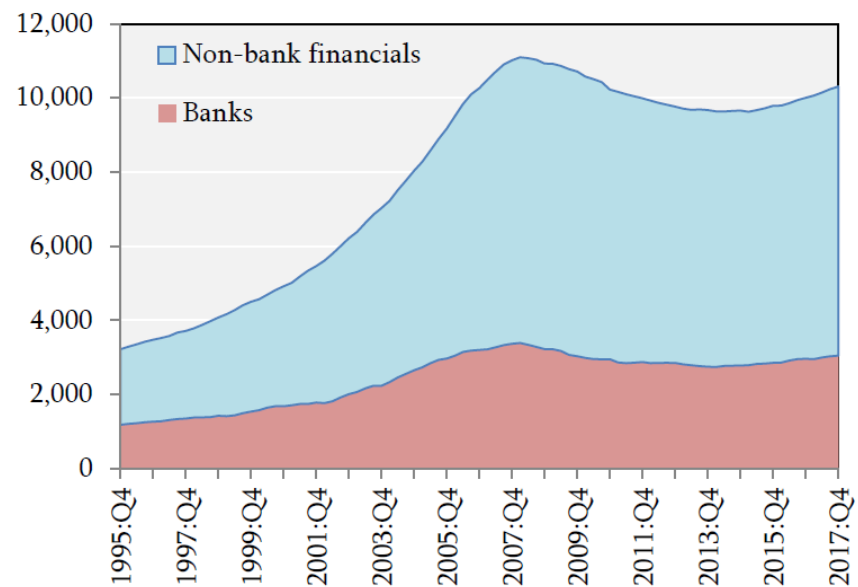
**Figure 2:** Reliance on short-term funding (\$bn)



Source: Financial Accounts of the U.S., based on Adrian et al. (2017)

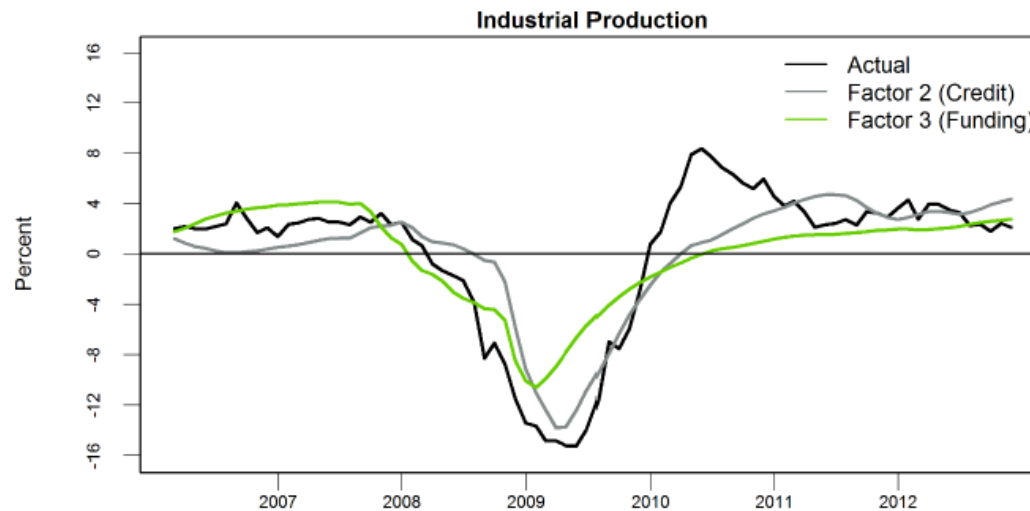
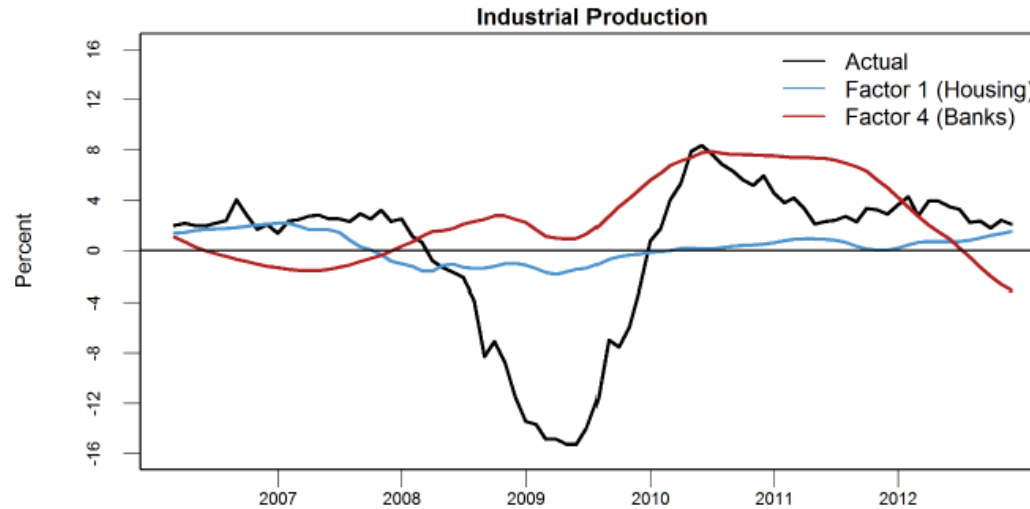
Source: Aikman et al. (2018)

**Figure 3:** Home mortgage credit by type of lender (\$bn)



Source: Financial Accounts of the U.S.. Non-bank financials includes life insurance companies, private pension funds, State and local govt. retirement funds, Government-sponsored enterprises, Agency- and GSE-backed mortgage pools, ABS issuers, Finance companies, and REITs.

# Why so deep? (1)

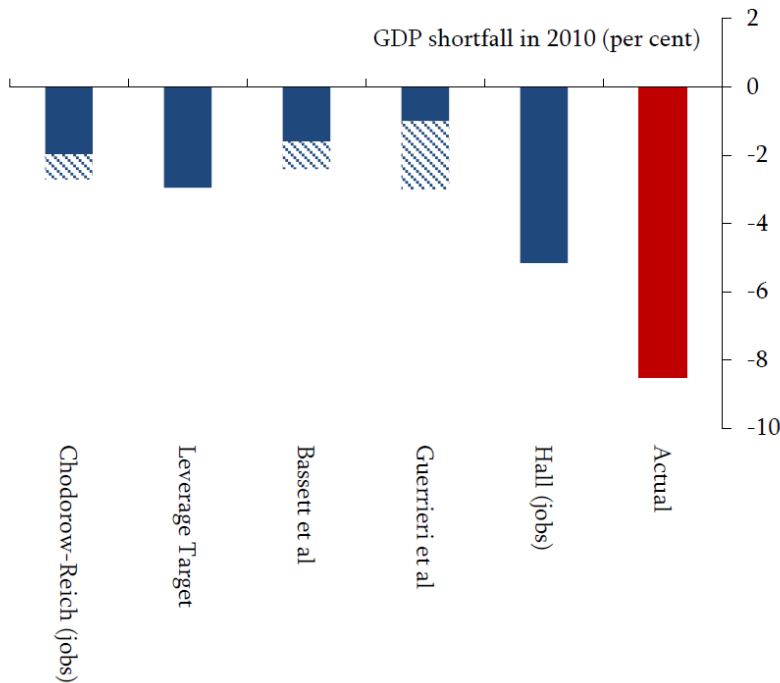


Source: Bernanke (2018)

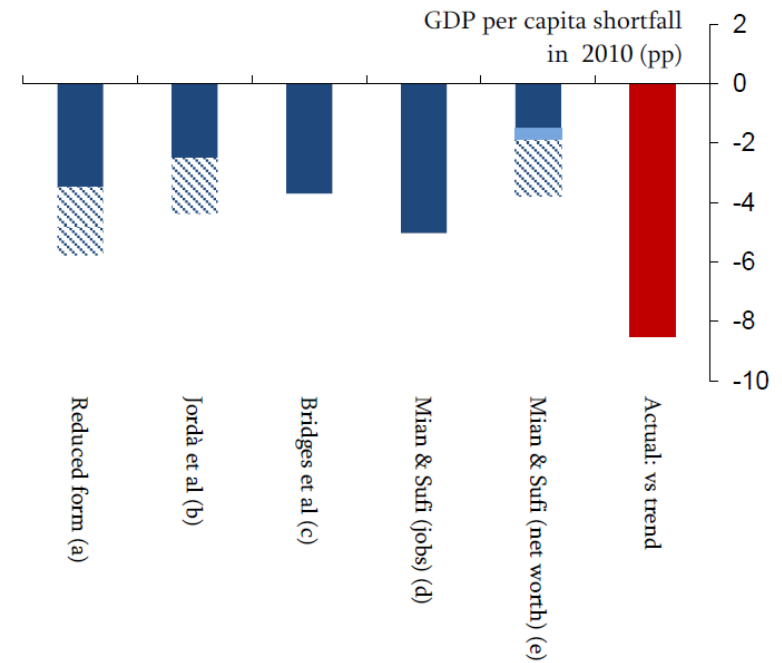
# Why so deep? (2)



**Figure 7:** Estimated impact of the credit crunch on US GDP in 2010



**Figure 10:** Estimates of the impact of the household debt boom on the severity of the U.S. recession



Source: Aikman et al. (2018)



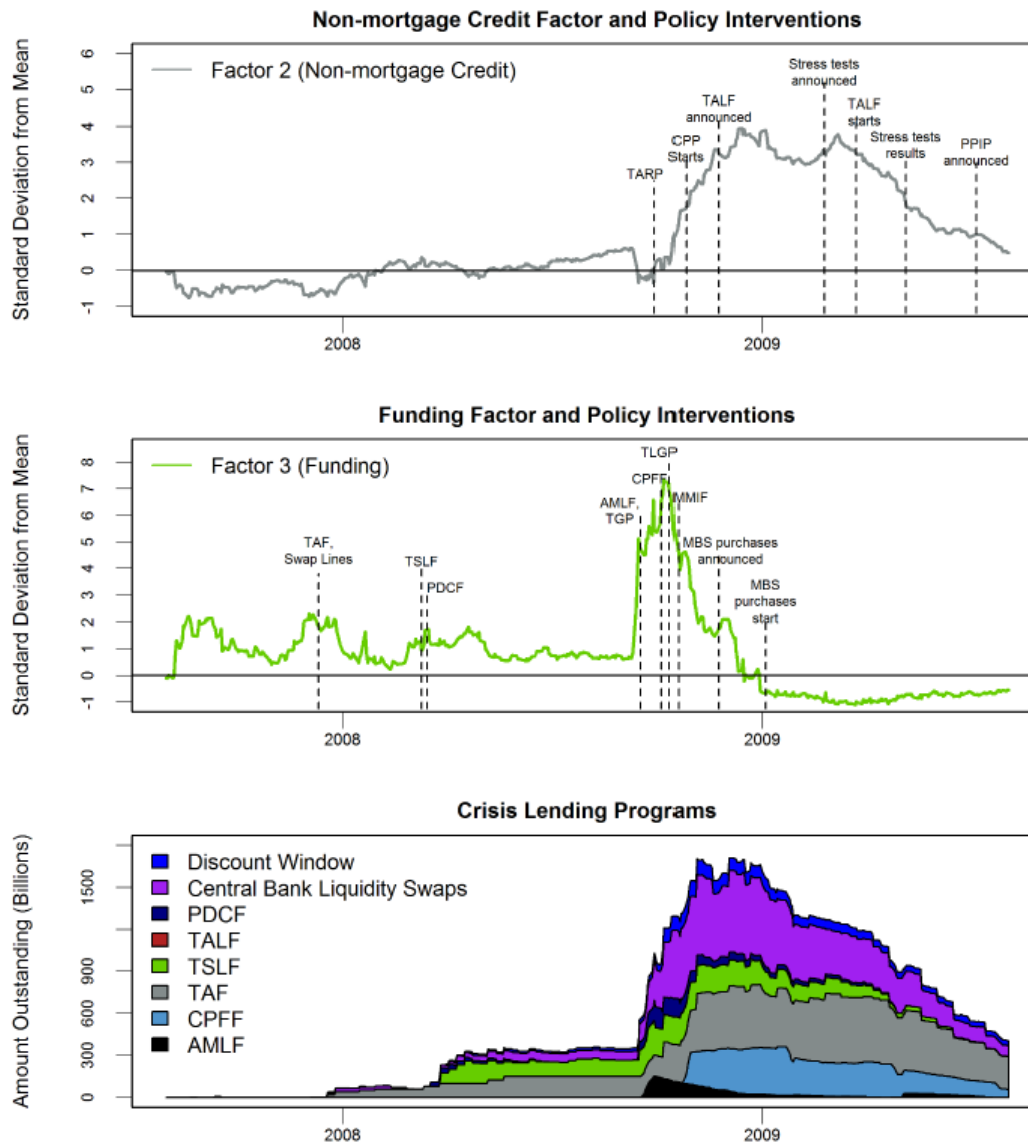
# Policy responses

# Policy responses (1)



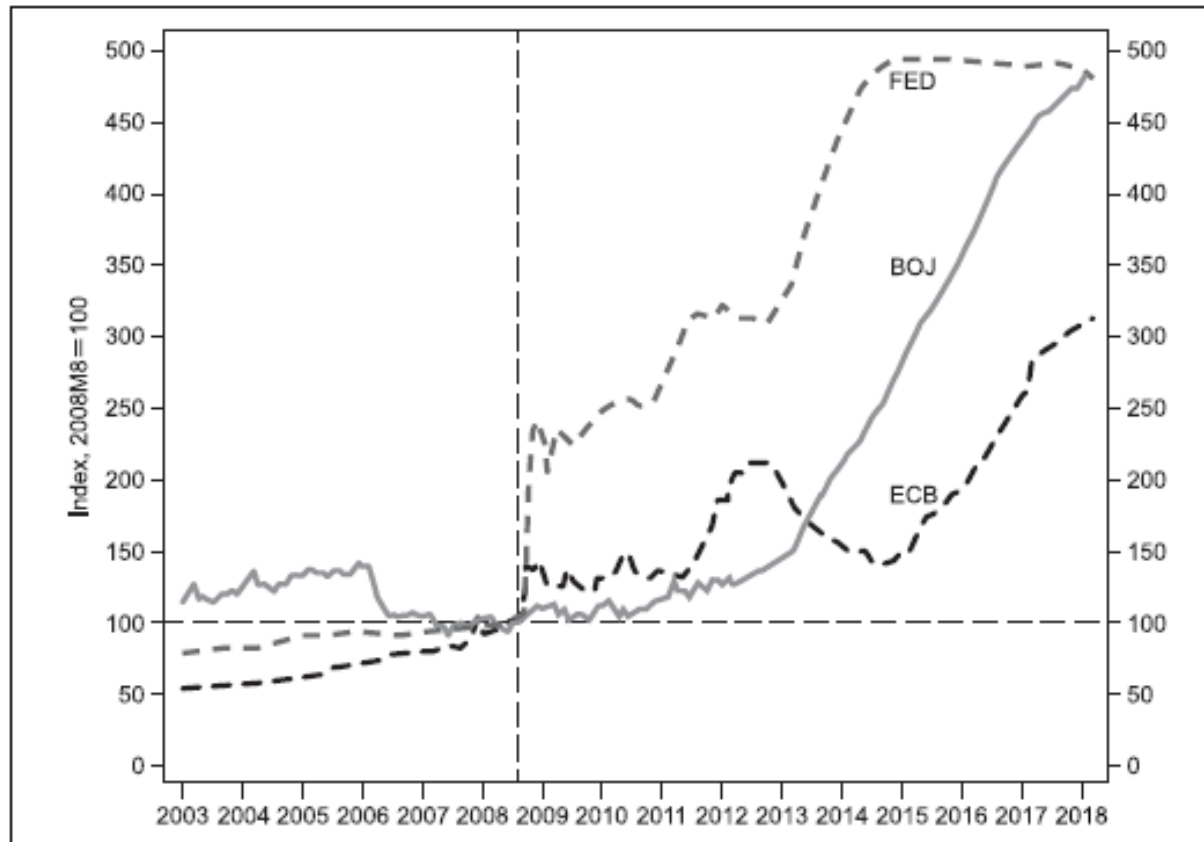
- **Liquidity: to contain panic**
- **Recapitalization: to ensure solvency of systemically important institutions**
- **Monetary easing: non-standard measures**
- **Fiscal stimulus**

# Policy responses (2)



Source: Bernanke (2018)

# Policy responses (3)

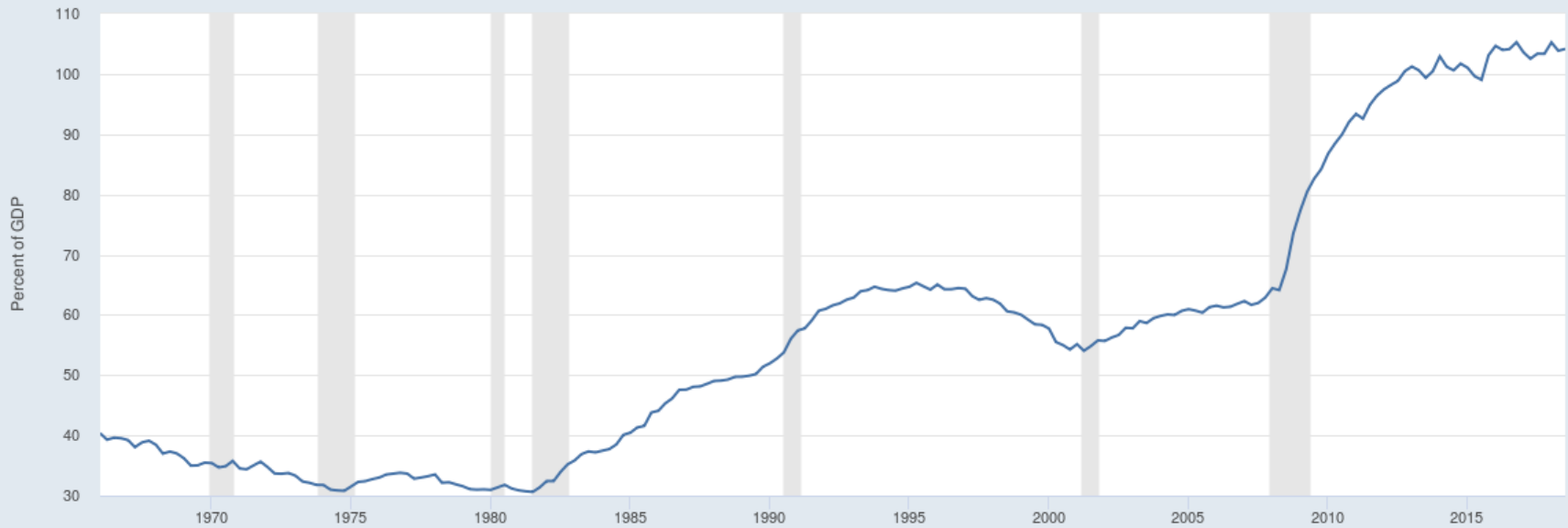


Source: Orphanides (2018)

# Policy responses (4)



**FRED** — Federal Debt: Total Public Debt as Percent of Gross Domestic Product



*Shaded areas indicate U.S. recessions*

Source: Federal Reserve Bank of St. Louis

[myf.red/g/mfyJ](https://myf.red/g/mfyJ)



# What has changed?

# Regulatory responses



- **Stricter capital requirements**
- **Liquidity requirements**
- **Leverage control**
- **Ex ante restructuring mechanisms**
- **Regulation of rating agencies**
- **Changes to accounting principles**
- **Remuneration in the financial sector**

# Better prepared?

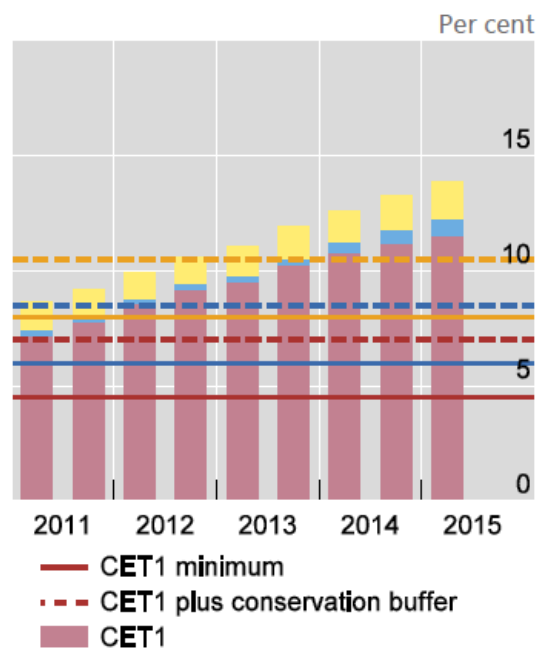


## Average fully phased-in Basel III CET1, Tier 1 and total capital ratios

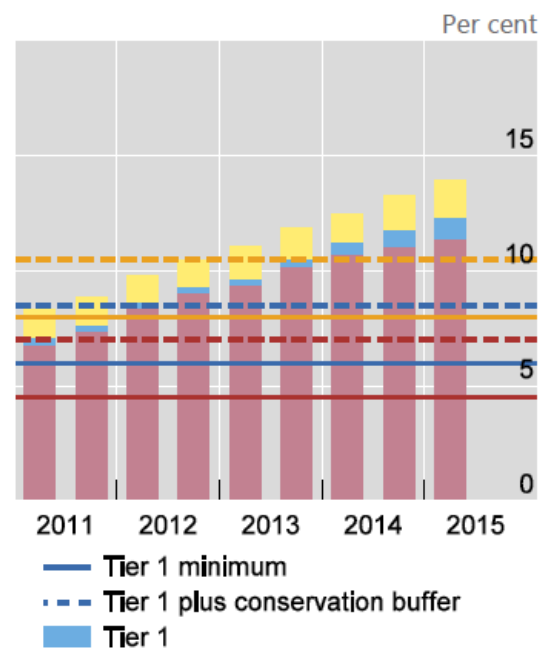
Consistent sample of banks<sup>1</sup>

Graph 5

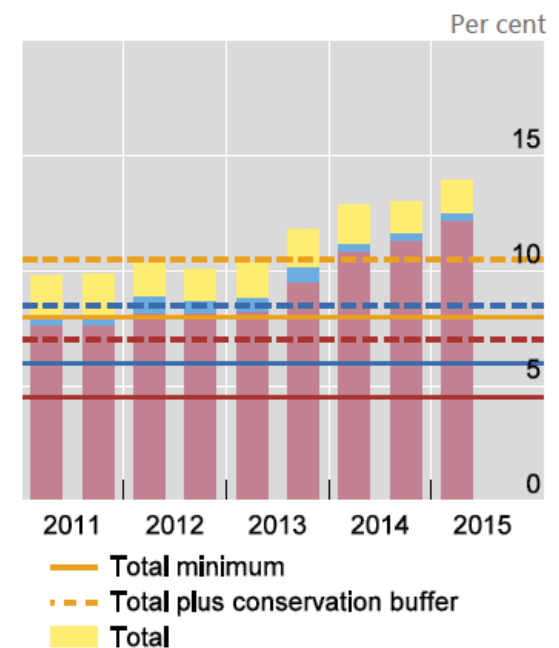
### Group 1 banks



### Of which: G-SIBs



### Group 2 banks



<sup>1</sup> Group 1 includes 91 banks, G-SIB includes 30 banks and Group 2 includes 71 banks.

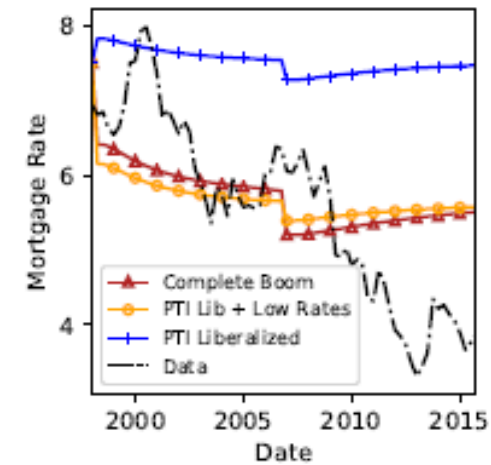
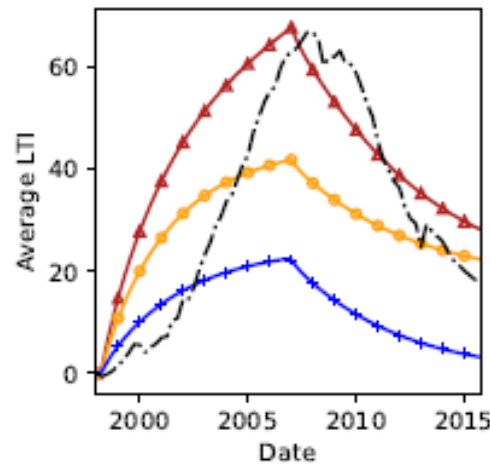
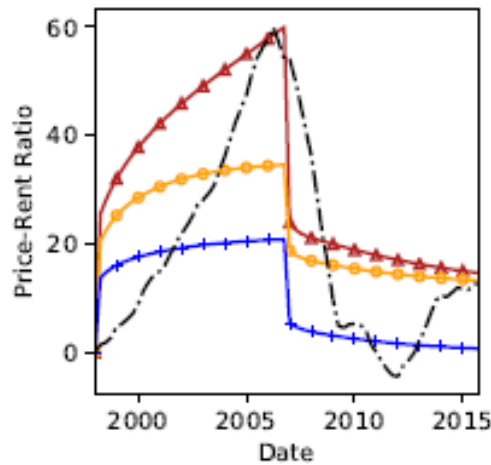
Source: Basel Committee on Banking Supervision. See also Table A.5.

# Macroprudential policies



- **To see the forest for the trees**
- **Dealing with externalities: credit crunch, fire sales, runs on markets, etc.**
- **Lender-based measures: counter-cyclical capital buffers**
- **Borrower-based measures: loan-to-value (LTV) limits, debts service to income ratios (DSTI), debt-to-income ratios (DTI)**

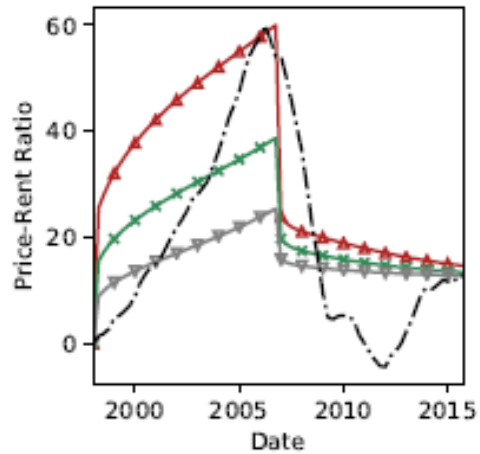
# Decomposing the boom



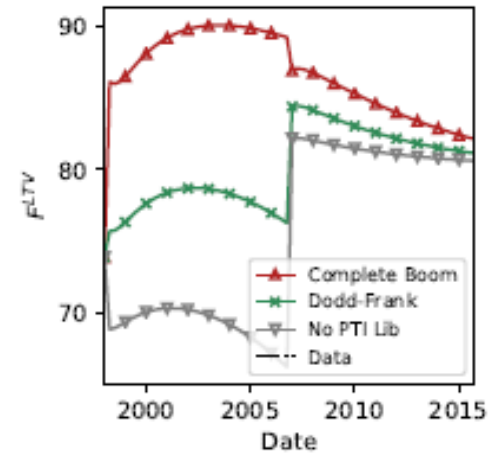
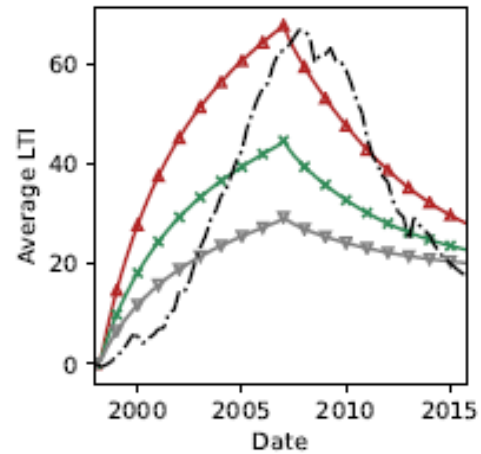
Source: Greenwood (2018)

Two additional shocks (complete boom):  
higher expected house prices and small  
liberalization of LTV limits

# Macroprudential counterfactuals



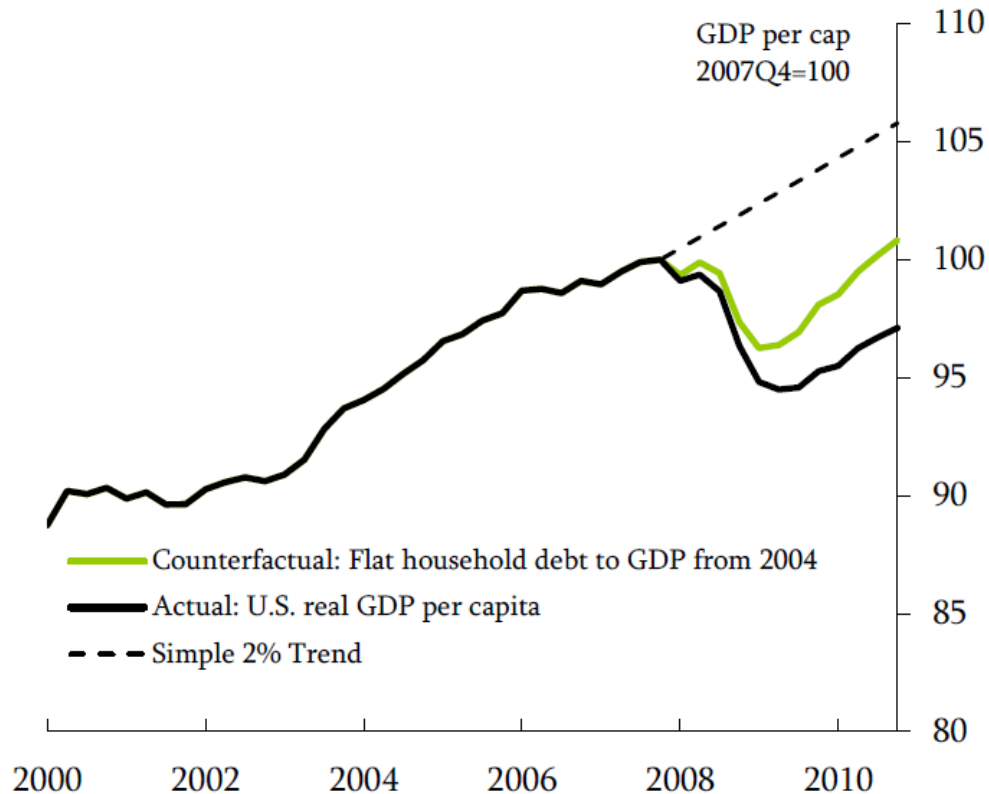
Source: Greenwood (2018)



# More counterfactuals



**Figure 9:** Counterfactual path of US GDP per capita if household credit boom ended in 2004



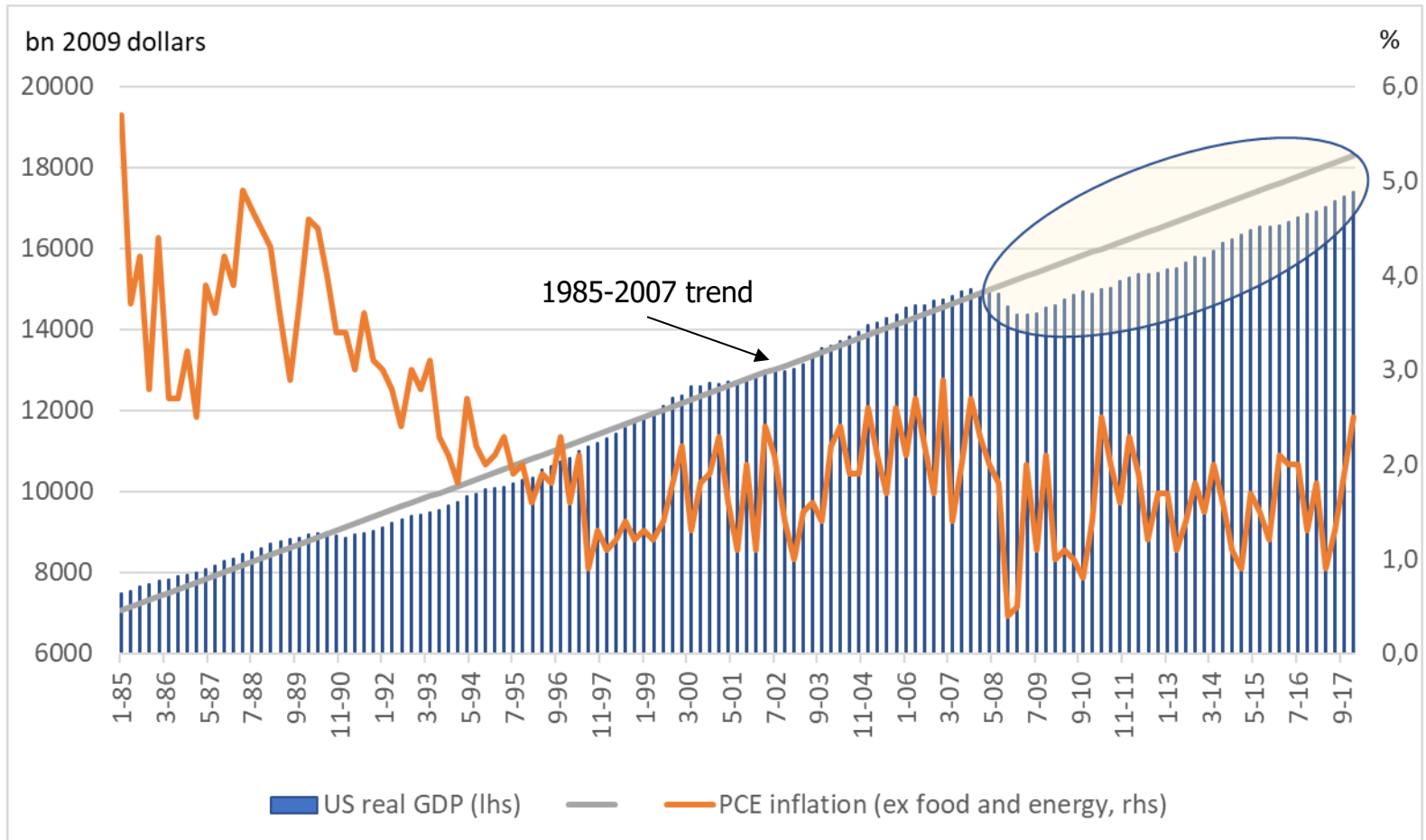
Source: Aikman et al. (2018)

# Rethinking monetary policy



- **Financial cycles have a far greater impact on economic activity than we thought**
- **The costs of financial financial crises are very high**
- **Price and output stability do not ensure financial stability**
- **Expanding the toolkit: liquidity provisions to non-banks, large-scale asset purchases, negative interest rates, forward guidance, helicopter money?**

# The problem for monetary policy



Source: FRED

# Rethinking fiscal policy (1)



- **Understanding the consequences of monetary-fiscal interactions is key to the design of macroeconomic policies**
- **Models without heterogeneity of agents and fiscal instruments are of limited use**
- **The long-term view, including contingent liabilities and proper risk assessment is important**
- **Synergies between home-grown fiscal rules and fiscal institutions might be more effective in combating the deficit bias**

# Rethinking fiscal policy (2)

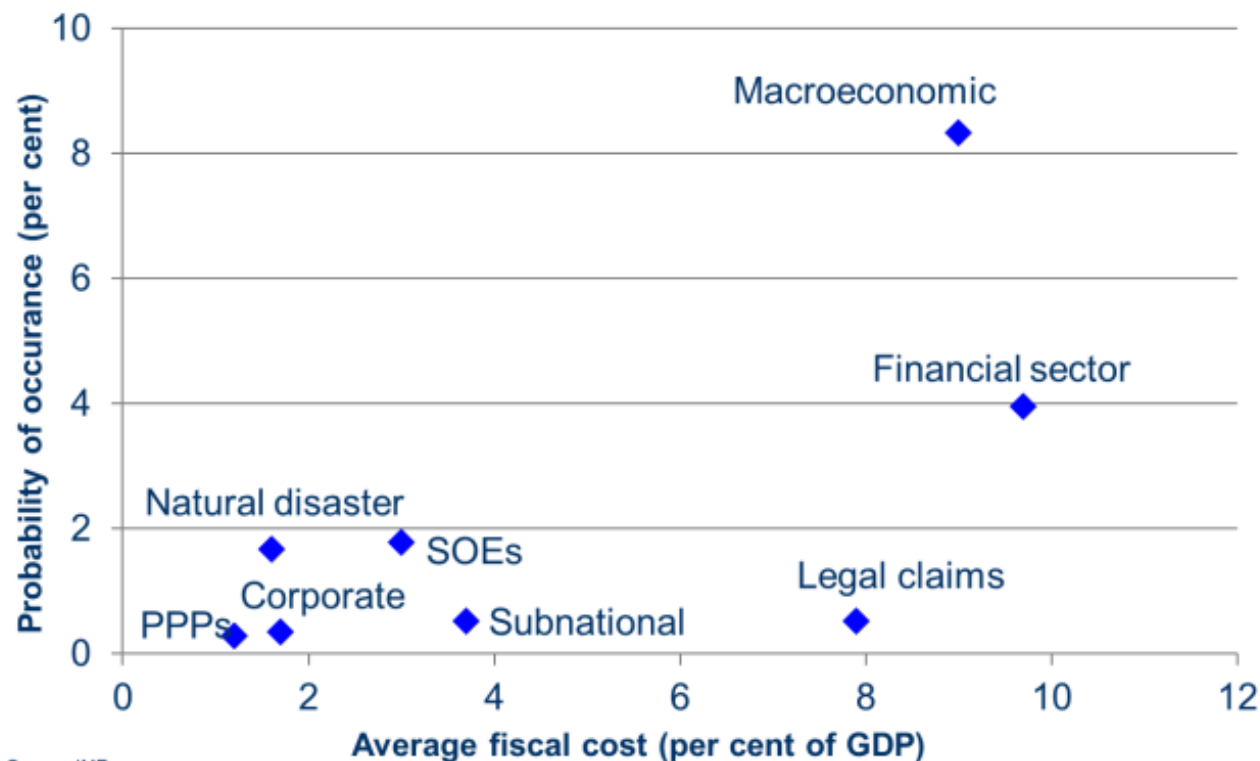


- **Fiscal rules should be smart in combining a long-term anchor (debt target) and short-term flexibility (expenditure rules)**
- **Political economy considerations should be an important part of any policy analysis**
- **Discretionary fiscal policy should be brought back onto the radar screen of analysts, either because of long recessions or due to consolidation needs to create adequate fiscal space in the long run**

# Rethinking fiscal policy (3)



Figure 4 – Costs and frequency of fiscal risk realizations



Source: IMF

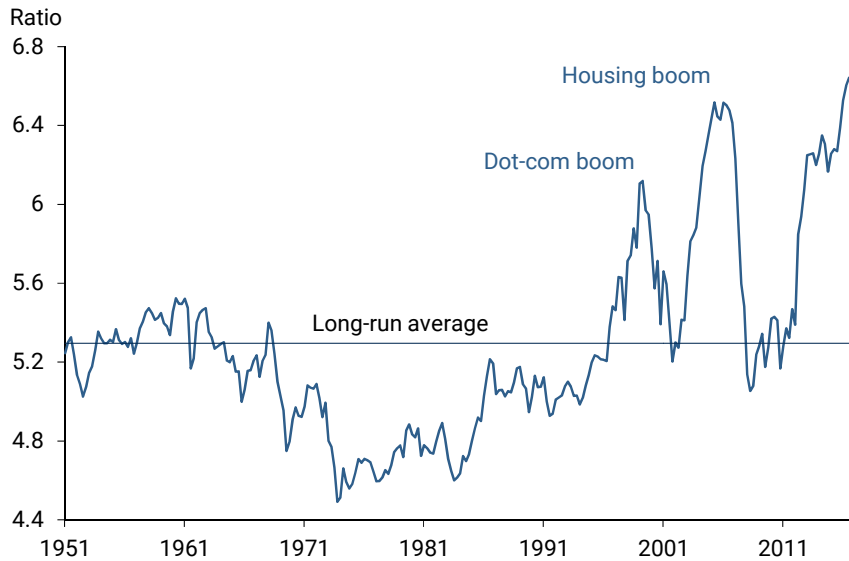


# Remaining challenges

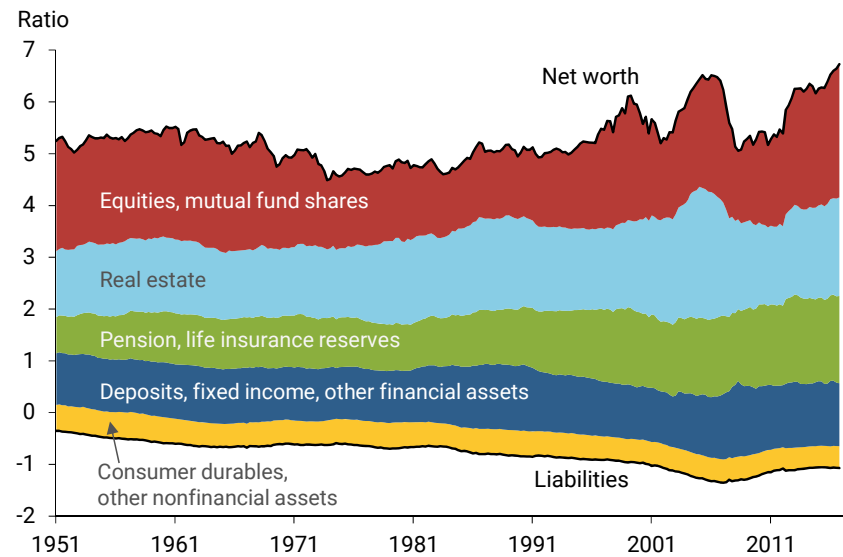
# Elevated asset prices



## Ratio of household net worth to income



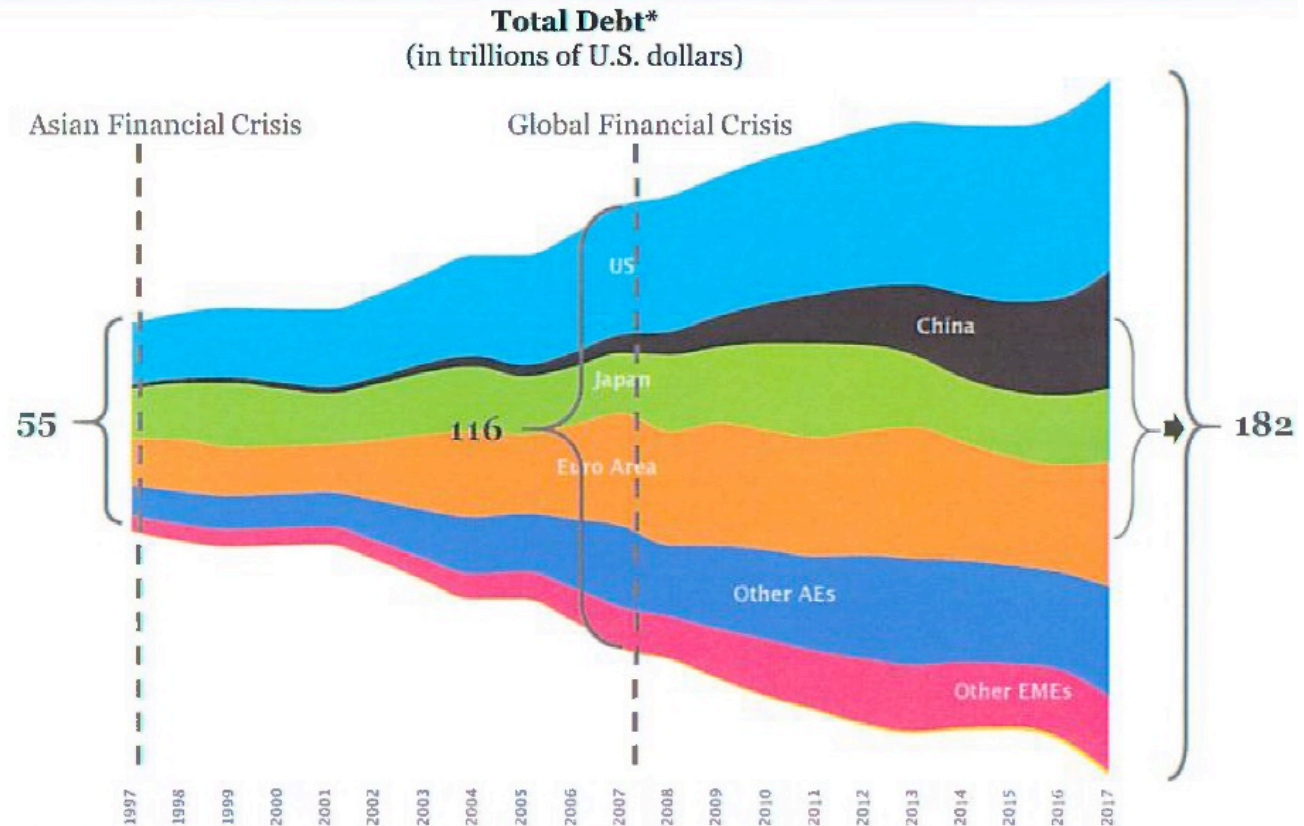
## Household net worth and components of disposable income



# Still high debt



## Global Debt Breaking Record — \$182 Trillion

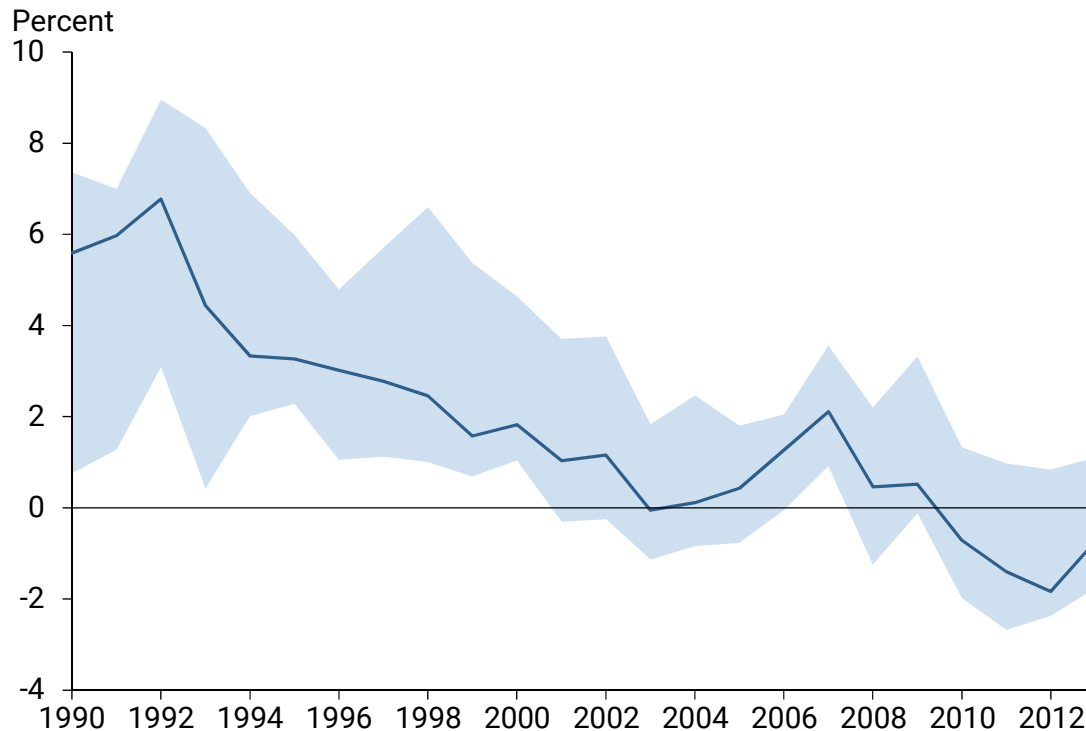


Source: IMF Global Debt Database (2018), preliminary estimates. \* Total debt is the sum of public and private debts.

# ELB will bind more often



## Real interest rate in developed economies, median and range



Note: Real short-term rates calculated as yields on short-term government securities with maturity less than 1 year minus realized CPI inflation. Shaded area shows the 90-10% range across countries. Sample includes Belgium, Germany, Finland, France, Greece, Iceland, Ireland, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, United Kingdom, and the United States.

# Other challenges



- **Stricter regulation/macropru mainly for banks**
- **No definite institutional solution in the euro area**
- **Populism/protectionism/de-globalisation**
- **Ageing**

# Conclusions



- **GFC was a poisonous combination of weak household balance sheets and highly leveraged shadow banking system**
- **Panic factors are important in explaining the depth of the recession**
- **Next crisis: banking sector is better prepared, but not public finances and monetary policy**
- **Institutional foundations of the euro are still not complete**

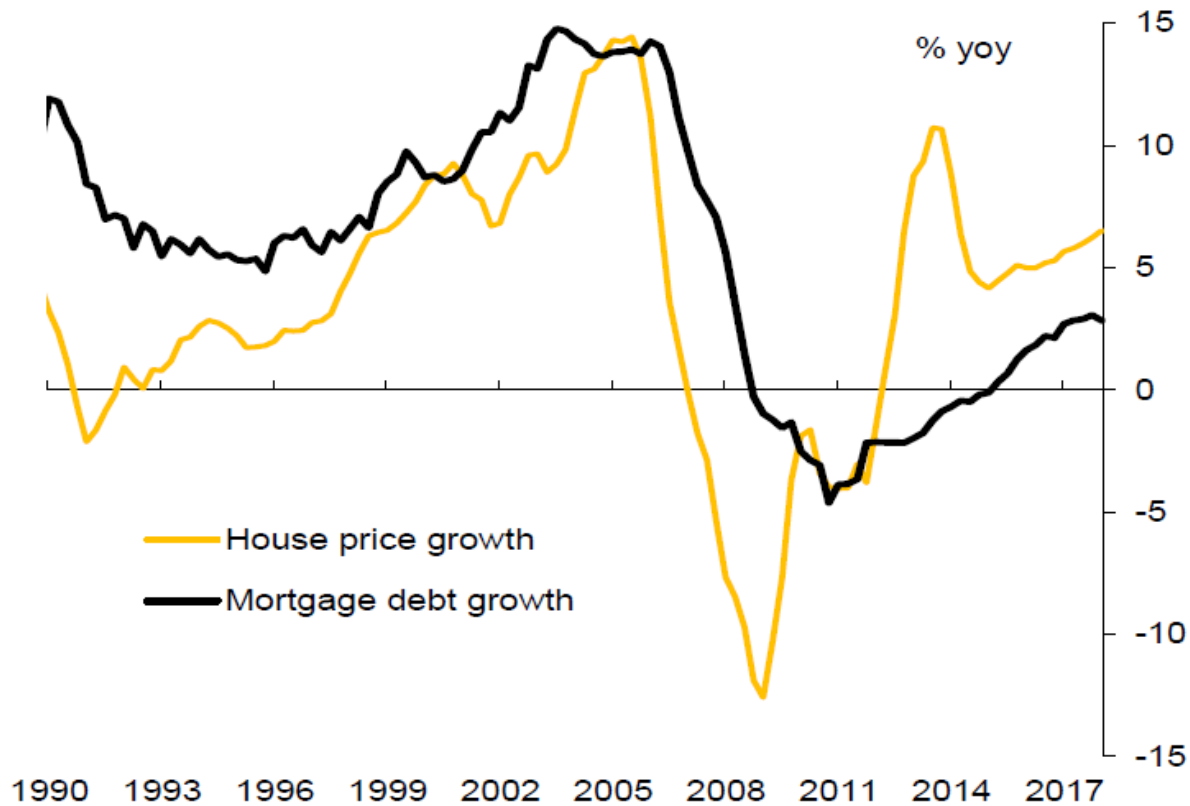


**Thank you for your attention!**

# Fault lines (1)

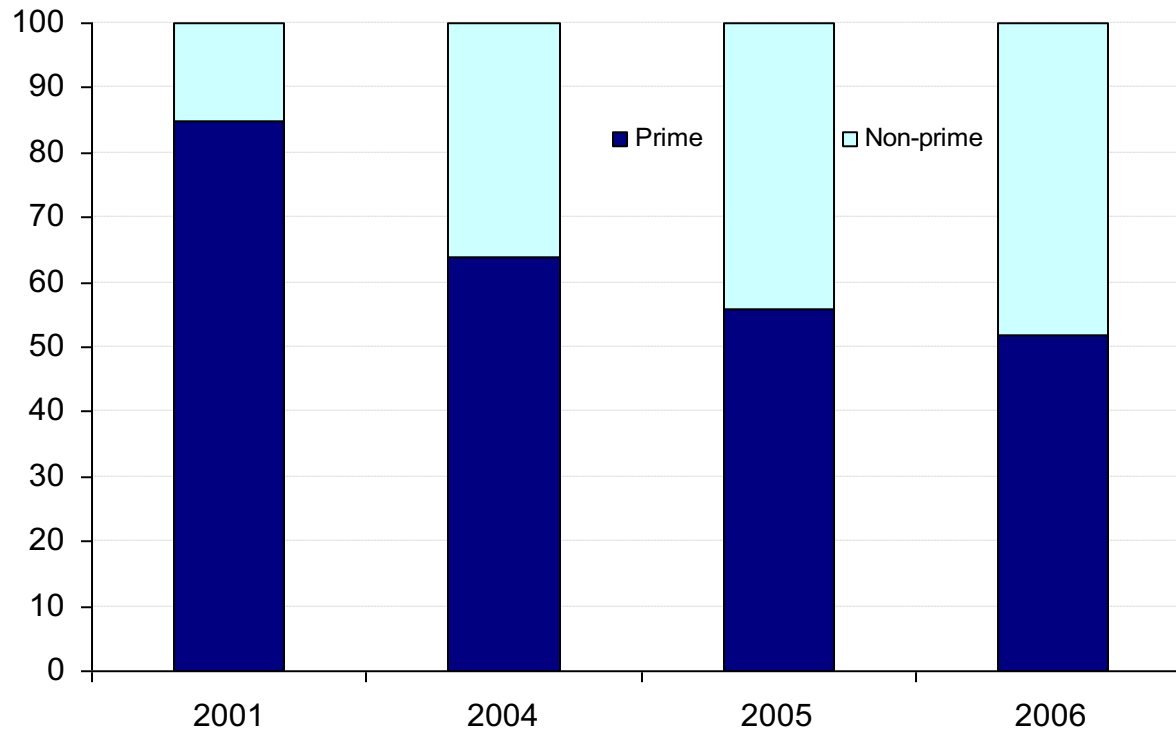


Figure 5: Mortgage debt and house prices



Source: Financial Accounts of the U.S. and S&P/Case-Shiller U.S. National Home Price Index

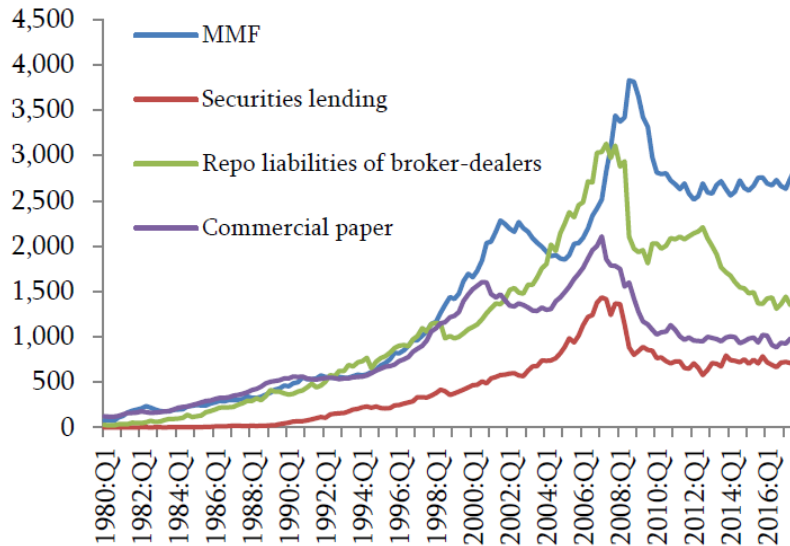
# Fault lines (2)



# Fault lines (3)

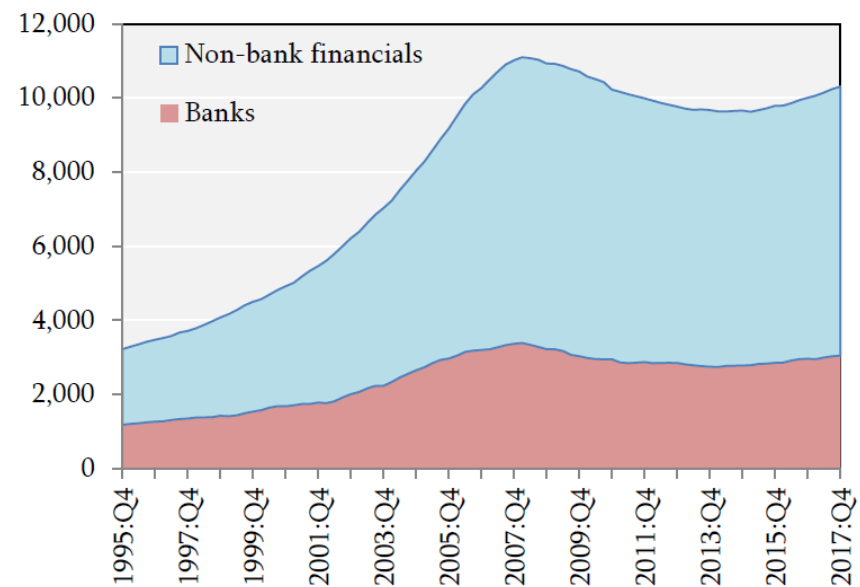


**Figure 2:** Reliance on short-term funding (\$bn)



Source: Financial Accounts of the U.S., based on Adrian et al. (2017)

**Figure 3:** Home mortgage credit by type of lender (\$bn)



Source: Financial Accounts of the U.S.. Non-bank financials includes life insurance companies, private pension funds, State and local govt. retirement funds, Government-sponsored enterprises, Agency- and GSE-backed mortgage pools, ABS issuers, Finance companies, and REITs.

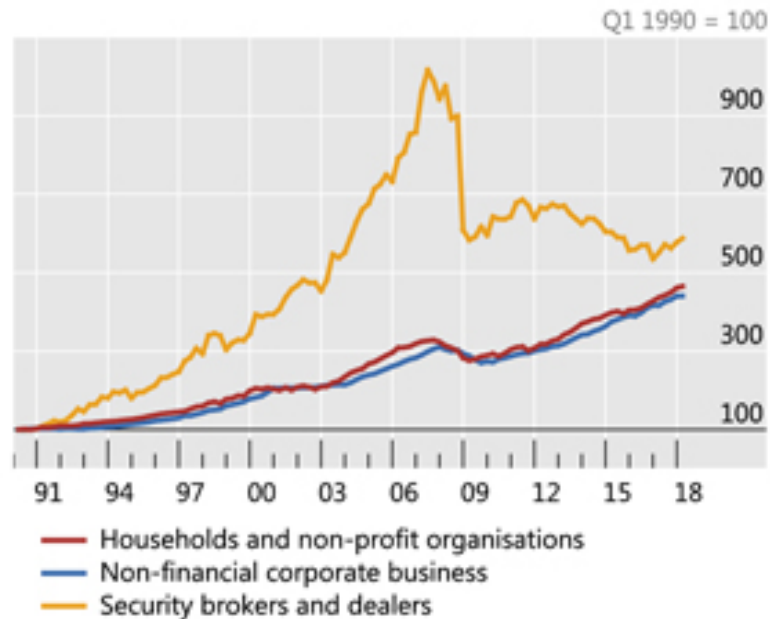
# Fault lines (4)



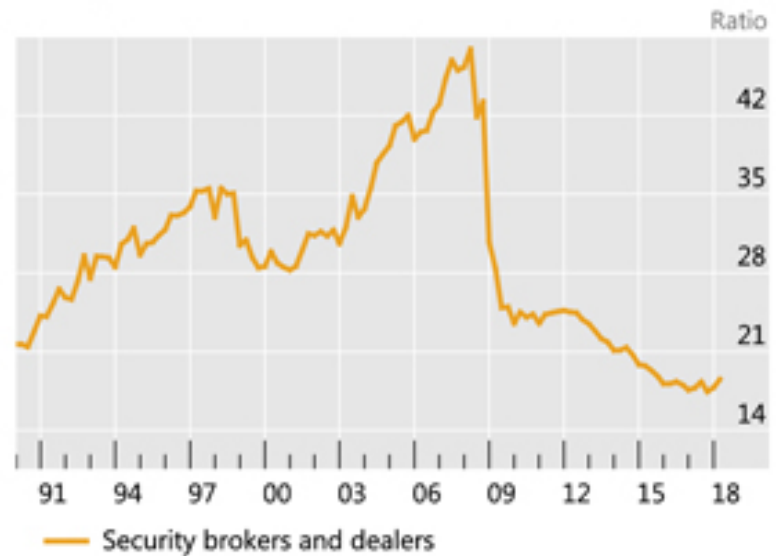
Total assets and leverage of the US securities broker-dealer sector

Graph 1

Total assets



Leverage<sup>1</sup>



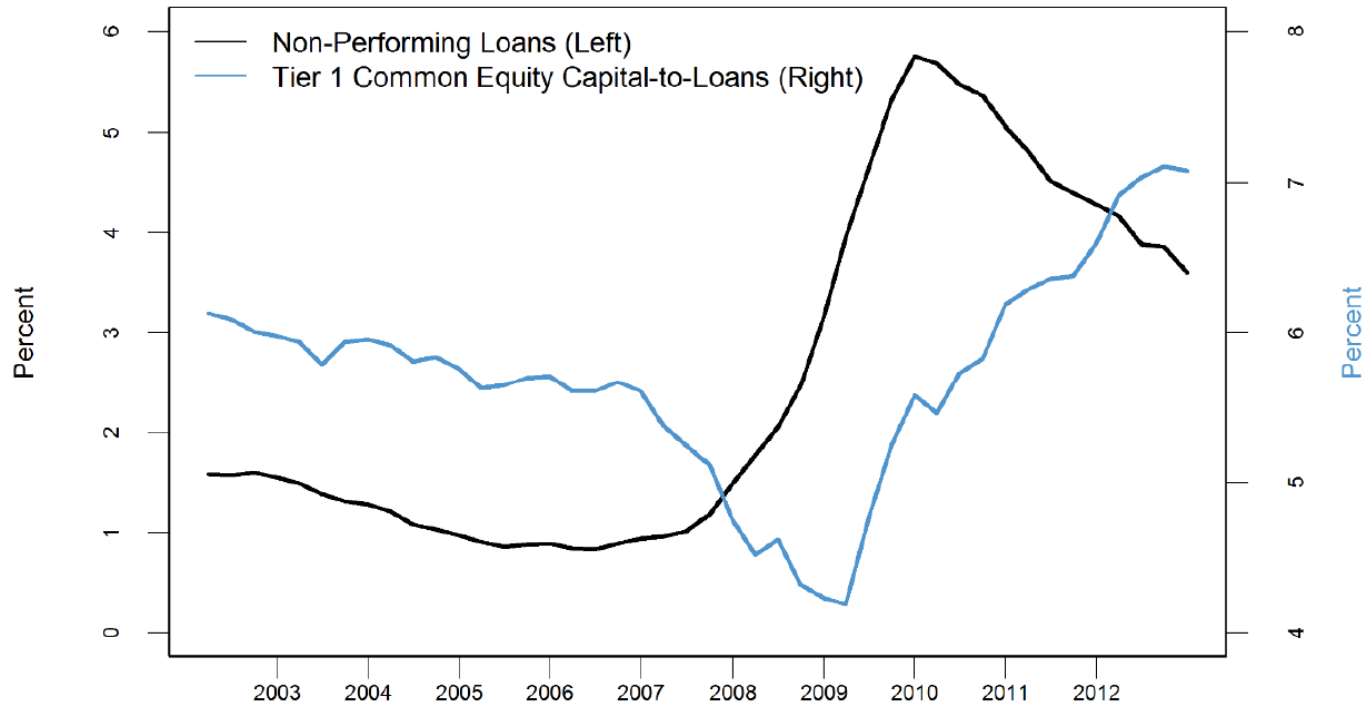
<sup>1</sup> Calculated as total assets divided by equity.

Sources: Federal Reserve, flow of funds accounts; BIS calculations.

# Fault lines (5)



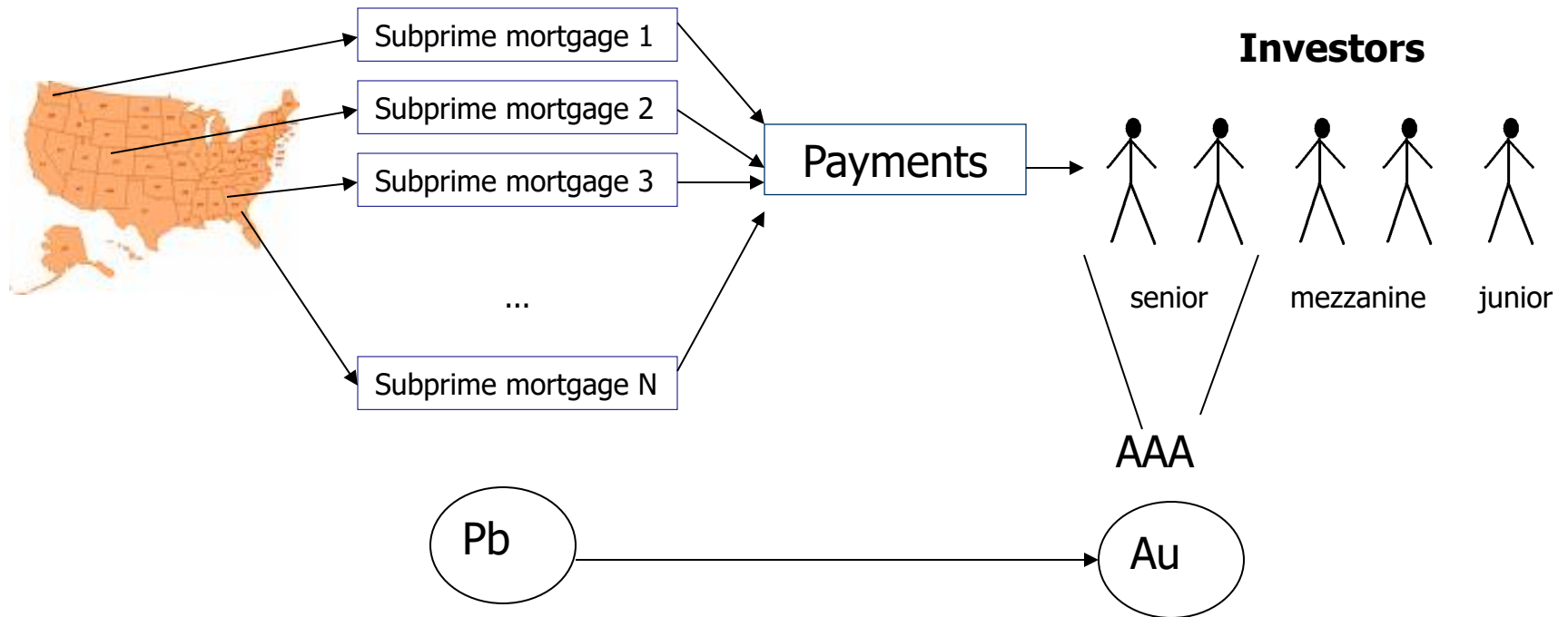
Figure 4. Capital and Non-performing Loans at Commercial Banks, 2002-2012<sup>11</sup>



Source: Bernanke (2018)

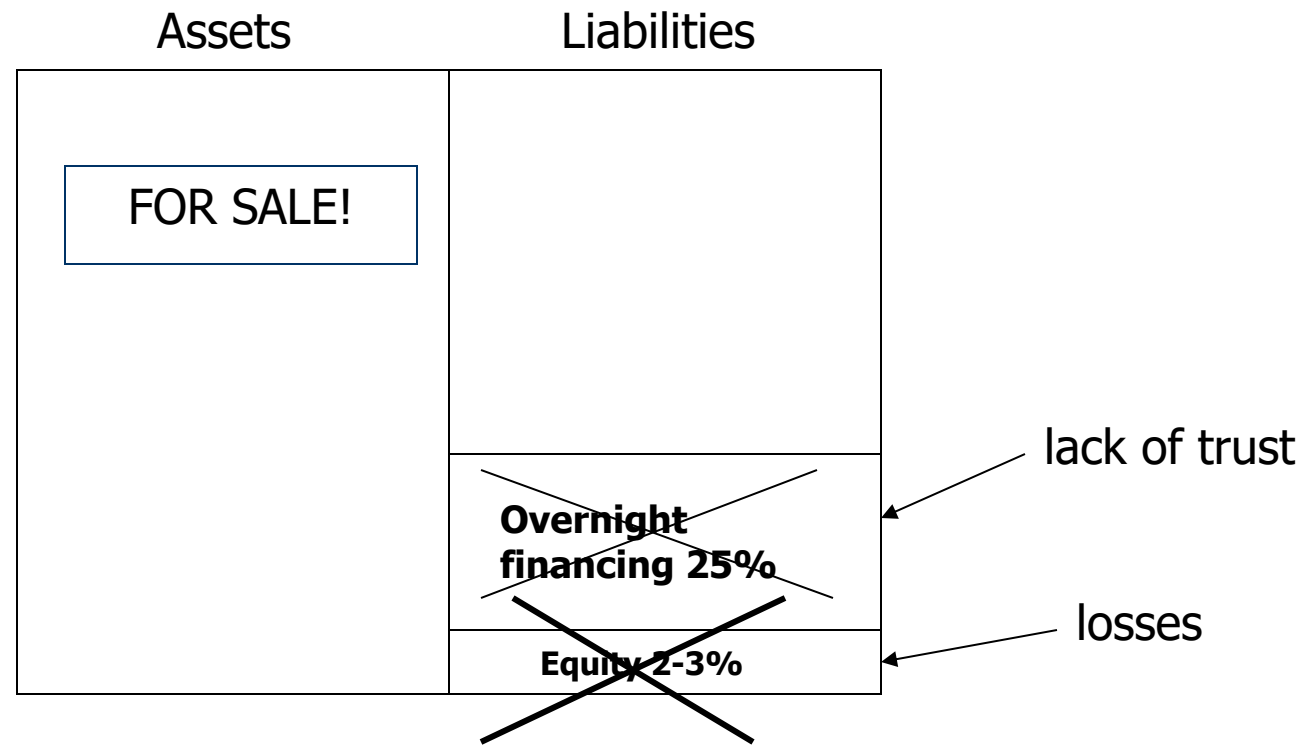


# Securitization





# Maturity mismatch, high leverage



Fire sales externality, domino effects, contagion, panic