Survey on financial crisis: causes, consequences, policy responses and aftermaths

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EE432

Semester 1/2018

References

- Chapter 12/13 Mishkin**
  - Advanced v.s. emerging market financial crisis
- Reinhart and Roggoff “This time is different: Eight centuries of Financial folly”
  - A good survey on financial crisis over the past 800 years, written by two well-known economists
- Financial Crises “Explanations, Types, and Implications” *Stijn Claessens and M. Ayhan Kose IMF 2013*
- Schularick & Taylor “Credit Booms Gone Bust: Monetary Policy, Leverage Cycles and Financial Crises, 1870–2008” AER 2012
- Financial Crises: Theory and Evidence Franklin Allen

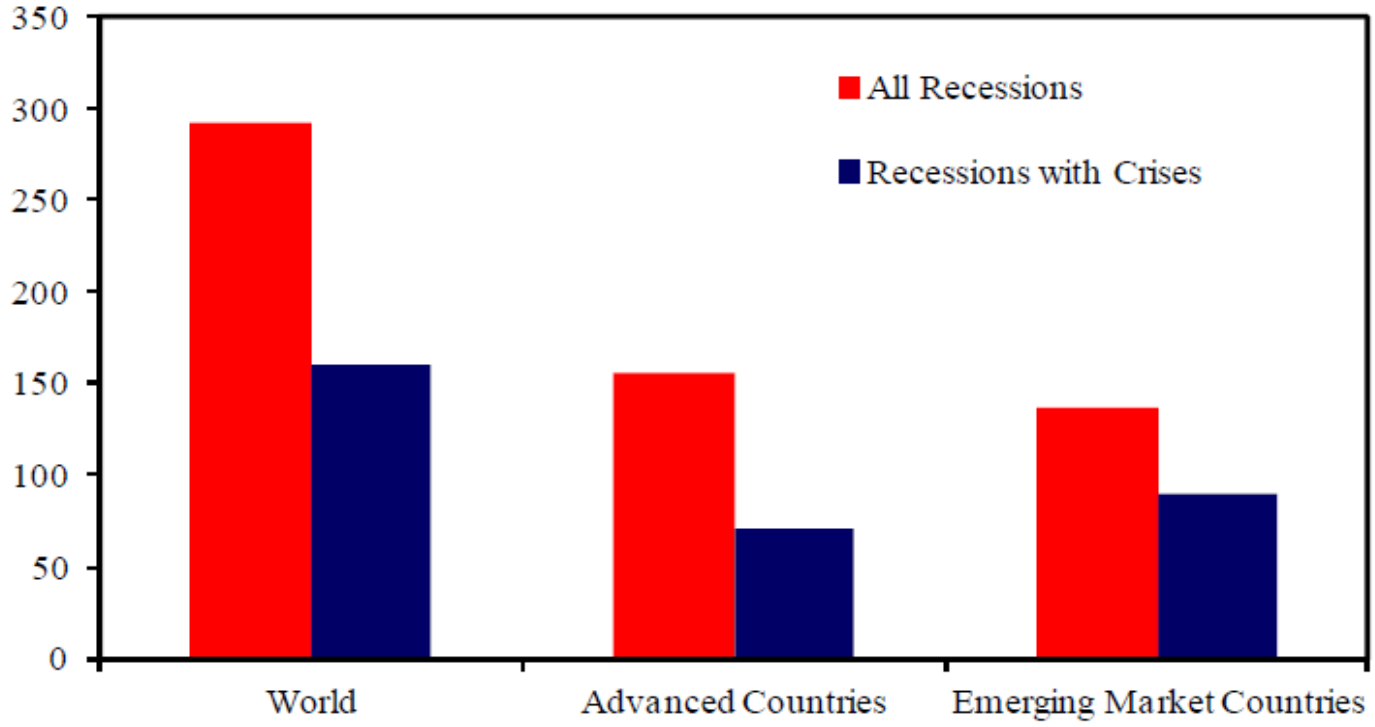
Agenda

- Historical episode of crisis:
  - Type / common anatomy / facts (outcomes)
- Global financial crisis: The Subprime
- In the wake of Global financial crisis: what have we learned?

Economics recession and financial crisis

- **Recession:** decline in real GDP
- Recession can occur because of two main contributing factors
  - **Real factors**, e.g. oil shocks, earthquake
  - **Financial factors**, e.g. the GFC
- Recession / economics crisis lead by financial factor = financial crisis
  - Typically, the impact is large and prolonged
- After 1990s, most economic crises have been linked to financial factors

Economics recession and financial crisis



Notes : A recession is associated with a financial crisis if the financial crisis starts at the same time with the recession or one year before or two years after the peak of the recession. The sample includes data for 23 advanced countries and 38 emerging market countries, and covers 1960-2011.

Figures: Stijn Claessens and M. Ayhan Kose (IMF: 2013)

An exhaustive lists of some important financial crisis: what are they?

- Tulip mania (1637)
- US banking panic (early 1930s)
- Saving and Loans Crisis (late 1980s)
- Scandinavian Balance of payment/Banking Crisis (early 1990s)
- Japan financial crisis (early 1990s)
- Argentina (Latin America) crisis (mid 1990s)
- Asian financial crisis (1997s)
- The Ruble Russian Crisis (1998s)
- Dot-com crisis (2001s)
- Subprime crisis (2008)
- European debt crisis (2010)

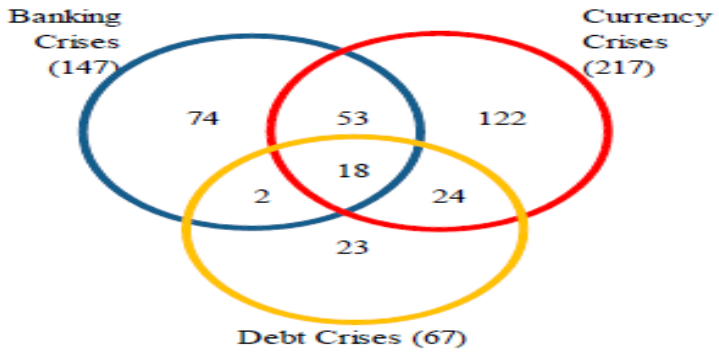
Grouping financial crisis

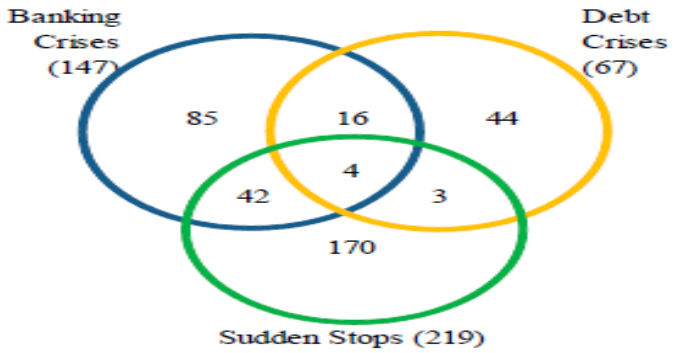
- **Financial crisis can come in many forms**
  - Exchange rate (Currency) crisis
    - a *currency* crisis involves a speculative attack on the currency resulting in a devaluation (or sharp depreciation), or forcing the authorities to defend the currency by expending large amount of international reserves, or sharply raising interest rates, or imposing capital controls
  - Sudden stops: capital reversal
    - A *sudden stop* (or a capital account or balance of payments crisis) can be defined as a large (and often unexpected) fall in international capital inflows or a sharp reversal in aggregate capital flows to a country, likely taking place in conjunction with a sharp rise in its credit spreads

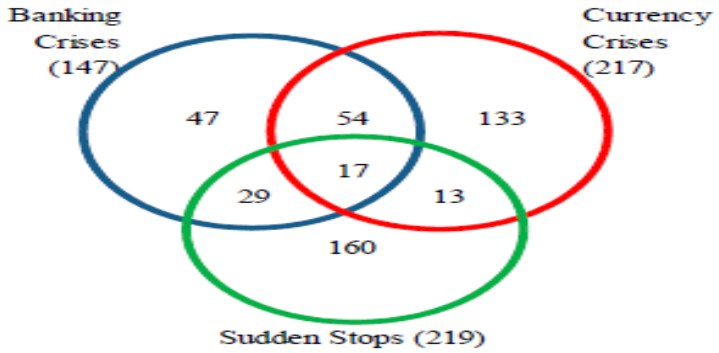
Grouping financial crisis

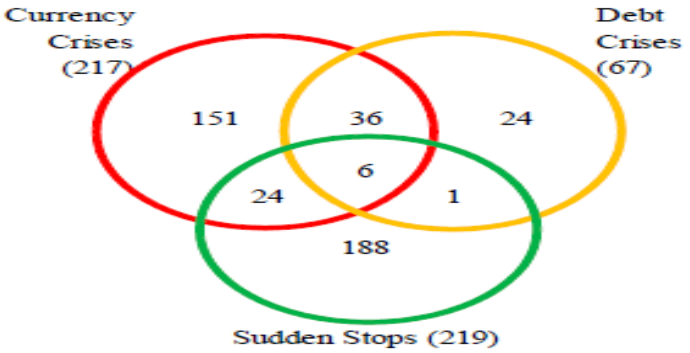
- **Financial crisis can come in many forms**
  - Debt crisis
    - A *foreign debt* crisis takes place when a country cannot (or does not want to) service its foreign debt, both private/sovereign
    - A *domestic public debt* crisis takes place when a country *does not honor its domestic fiscal obligations* in real terms; defaulting, inflating, currency debasement
  - (Systemic) Banking crisis
    - actual or potential bank runs and failures can induce banks to suspend the convertibility of their liabilities or compel the government to intervene to prevent this by extending liquidity and capital assistance on a large scale.

One type of crisis is usually followed by another type of crisis. (Concurrently occur at almost the same time)





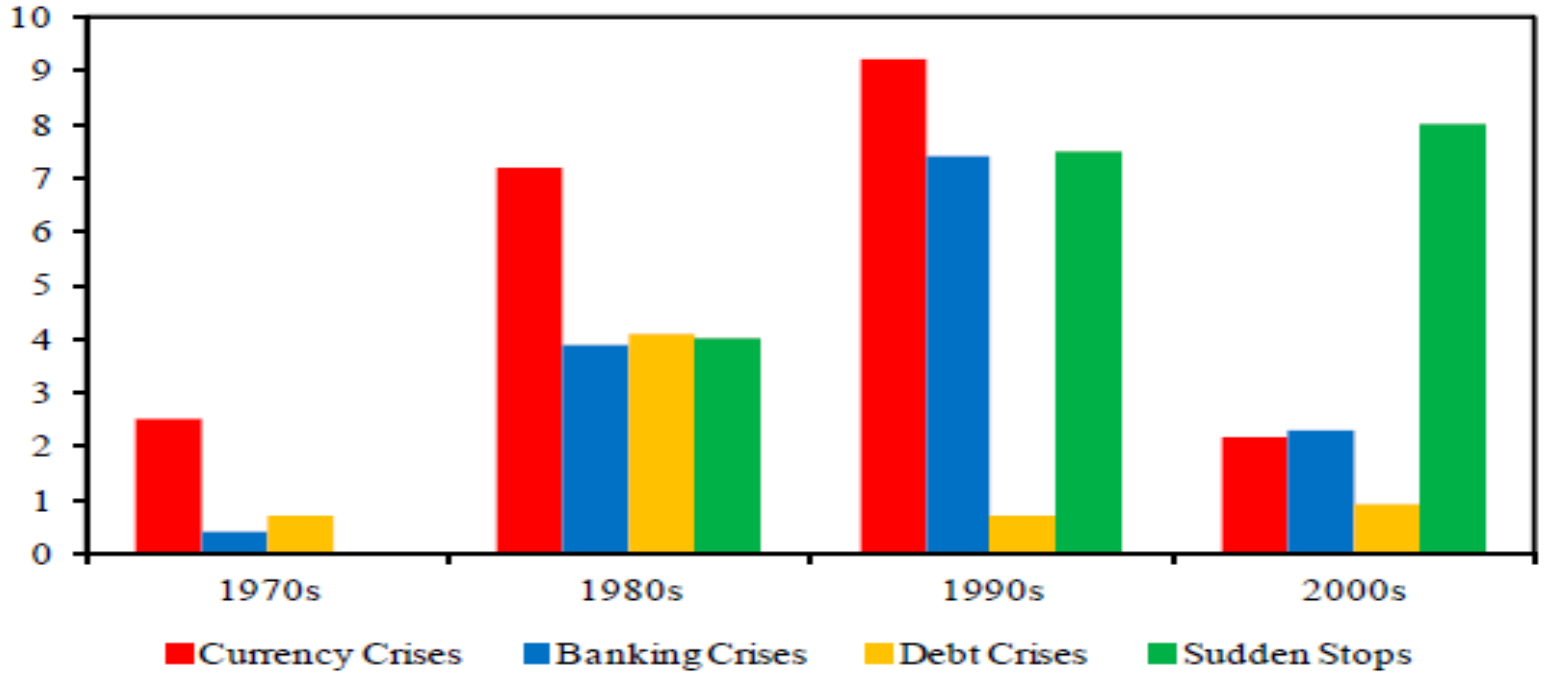




Notes : A financial crisis starting at time T coincides with another financial crisis if the latter starts at any time between T-3 and T+3. A financial crisis starting at time T coincides with two other financial crisis if the latter two start at any time between T-3 and T+3. The sample consists of 181 countries.
Sources : The dates of banking, currency, and debt crises are from Laeven and Valencia (2008, 2011) and the dates of sudden stops are from Forbes and Warnock (2011).

Figures: Stijn Claessens and M. Ayhan Kose (IMF: 2013)

Number of financial crises in respective decade



Notes : This graph shows the average number of financial crises in respective decades.

Sources : The dates of banking, currency, and debt crises are from Laeven and Valencia (2008, 2011) and the dates of sudden stops are from Forbes and Warnock (2011).

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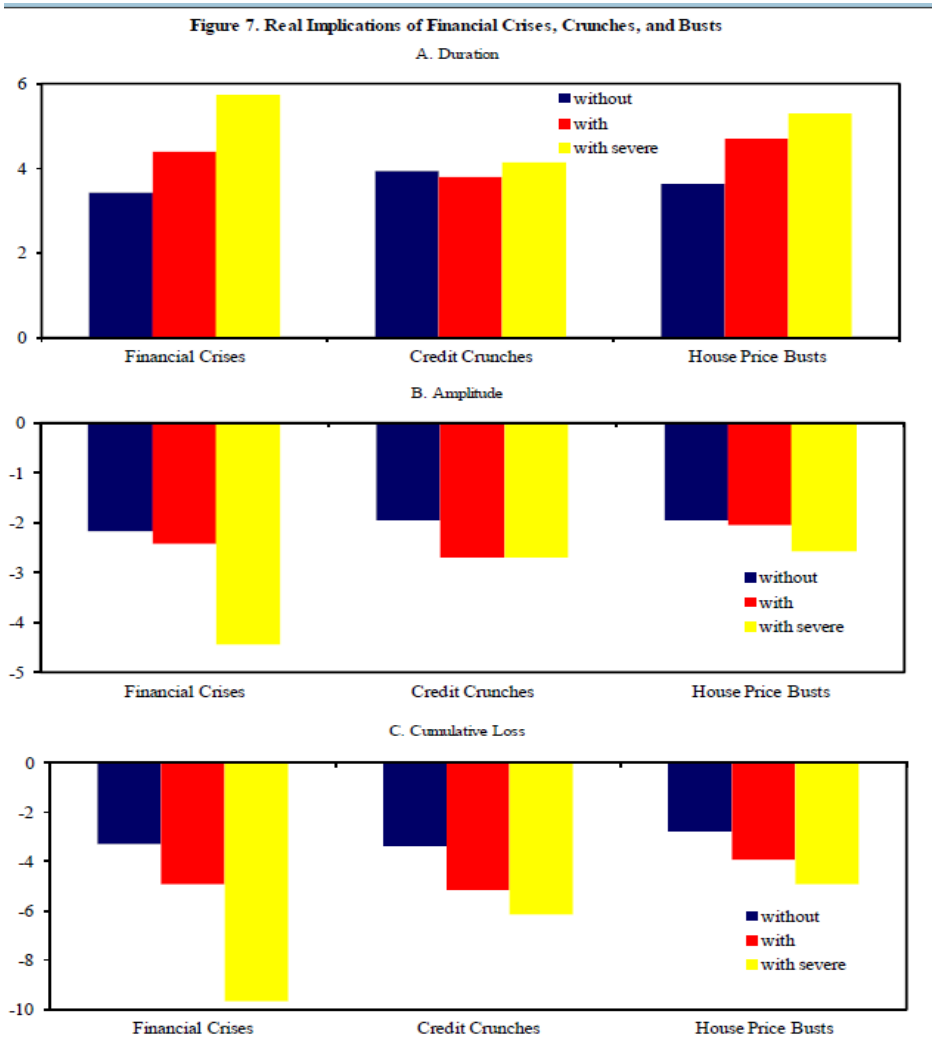
Real and financial implications of financial crises



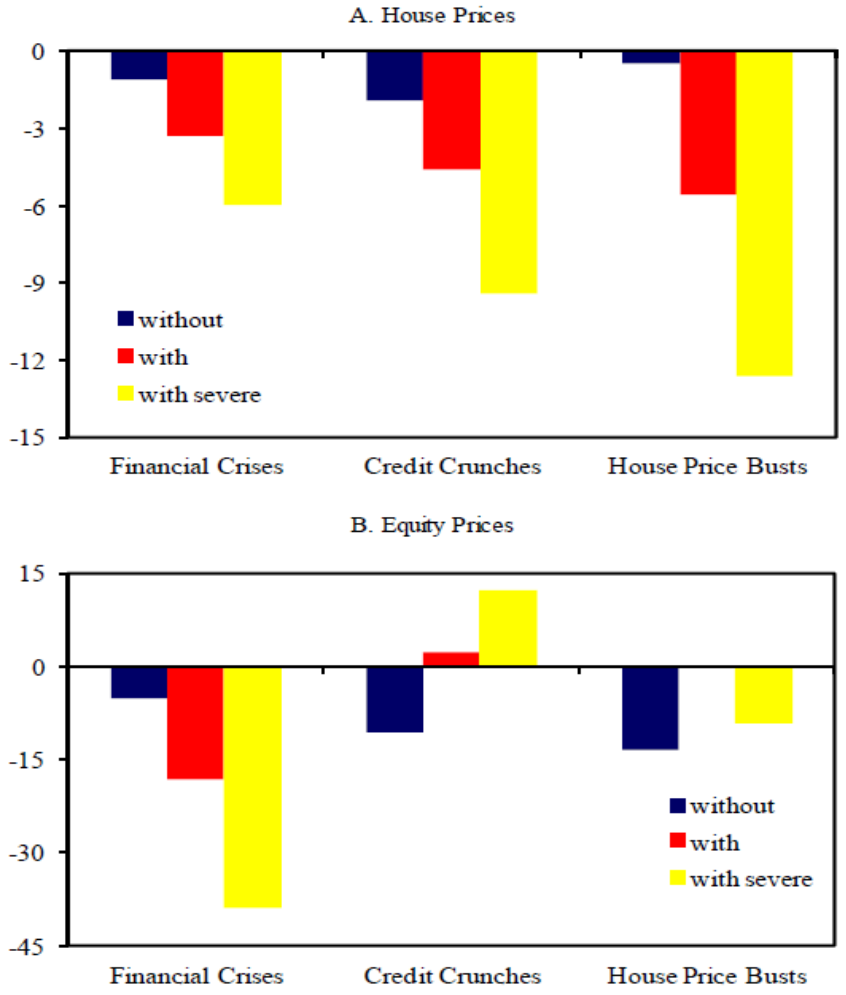


Table 2: Financial crises, 1980–2007

	Date	Output loss		
		Length	Depth[1, 2]	Cumulative loss relative to peak[2]
Argentina	03/1980	28	14.1	–44.5
Argentina	12/1989	9	12.1	–16.2
Argentina	01/1995	7	6.1	–5.2
Argentina	12/2001	14	15.1	–26.9
Bolivia[3]	11/1994	0	0.0	0.0
Brazil	02/1990	6	11.4	–6.0
Brazil	12/1994	7	2.5	–1.9
Bulgaria	01/1996	27	42.3	–129.3
Chile	11/1981	21	20.2	–60.1
Colombia	07/1982	0	0.0	0.0
Colombia	06/1998	14	6.8	–11.8
Côte d'Ivoire[3]	01/1988	5	0.4	–0.2
Croatia	03/1998	6	13.5	–8.3
Czech Republic	01/1996	13	2.7	–5.6
Dominica	04/2003	8	1.8	–1.8
Ecuador[3]	08/1998	11	6.3	–9.5
Estonia	11/1992	33	27.3	–116.8
Finland	09/1991	25	11.8	–40.7
Ghana[3]	01/1982	20	13.3	–31.3
Indonesia	11/1997	21	18.1	–50.7
Jamaica[3]	12/1996	25	3.3	–10.3
Japan	11/1997	15	3.4	–6.7
Korea	08/1997	7	9.2	–9.3
Latvia	04/1995	7	19.6	–14.8
Lithuania	12/1995	2	0.6	–0.2
Malaysia	07/1997	9	11.2	–13.8
Mexico	12/1994	9	10.4	–10.7
Nicaragua[3]	08/2000	0	0.0	0.0
Norway	10/1991	3	1.5	–0.6
Paraguay[3]	05/1995	0	0.0	0.0
Philippines	07/1997	6	2.7	–2.2
Russia	08/1998	8	5.3	–5.1
Sri Lanka[3]	01/1989	0	0.0	0.0
Sweden	09/1991	16	5.8	–11.0
Thailand	07/1997	23	14.9	–33.2
Turkey	11/2000	8	9.3	–9.1
Ukraine[3]	01/1998	15	4.4	–10.1
Uruguay[3]	01/2002	18	10.3	–27.0
Venezuela	01/1994	8	6.9	–6.1
Vietnam[3]	07/1997	0	0.0	0.0
Mean		11.4	8.6	–18.4
Median		8.5	6.6	–9.2
Standard deviation		8.9	8.7	28.6

[1] Peak to trough decline in GDP; peak defined using four-quarter window before and after the crisis. [2] In per cent. [3] Annual data.

What determine the magnitude of the impact of crisis on length/duration/cumulative loss?

(1) country characteristics: GDP per capita and ***financial depth***;

(2) crisis characteristics: whether the crisis was ***accompanied*** by a currency or sovereign debt crisis, GDP, credit, money growth, and the real interest rate preceding the crisis;

(3) the existence of a boom in the run-up to the crisis, as measured by GDP, credit, money, the real and nominal interest rate, ***equity prices and property prices***;

(4) macroeconomic vulnerabilities, including the ***outstanding level of government debt*** and the ***fiscal balance, the current account, the net stock of foreign assets, and the deviation of the real exchange rate from its long-term average***;

(5) the nature of policy responses during the crisis, including deposit freezes and guarantees, bank mergers, nationalisations and closures;

(6) external conditions in the years after the start of the crisis, such as growth in the rest of the world, trading partner growth (this will capture changes in trade that are driven by changes in external demand), equity volatility, global risk aversion, and the presence of crises elsewhere

Source: Cecehtti et.al (BIS: 2009)

What "normally" paves its way to the financial crisis: sowing the seeds

- Financial crises were commonly preceded by the followings

1. Policy mismanagement or distortion

- Specific subsidy to some sectors, fueling misallocation of resource (e.g. Real estate sector)
- Exchange rate distortion (over-valued; most emerging countries)

What "normally" paves its way to the financial crisis: sowing the seeds

- Some common patterns occurred before the crisis are

2. Weak fundamental / Imbalances

- Internal imbalances: Fiscal deficit / public debt / Excessive spending by government sector (Argentina, Mexico)
- External imbalances: Persistent Current account deficit

What "normally" paves its way to the financial crisis: sowing the seeds

3. (Inefficient) Credit boom

- Various factors contributing to credit boom
  - Financial liberalization (e.g. free capital mobility)
  - Financial deregulation (e.g. Sub-prime securitized)
  - Government policies (e.g. US housing affordability policy)
  - Aggressive monetary expansion (e.g. kept interest rate too low for too long)
  - Spillover from Big countries (e.g. Capital inflow)
- Credit boom usually leads to financial imbalances
  - excessive risk-taking; excessive leverage → Asset price boom; **vulnerability to shocks**

Agenda

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- Global financial crisis: The Subprime

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Approach to present details

- **Origin:** developments toward crisis
- **Mechanic:** How crisis spreads out its effect to "real" economic activities
- **Consequence and mitigation:** policy remedy
- **Contagion and spillovers**

What happen?

- *2008 Crisis? =* **Mortgage default crisis**
  - Liquidity *and* credit crunches (e.g. market liquidity suddenly died out, credit squeeze)

- What is the origin?
  - *Mortgage default crisis* is only the symptom.

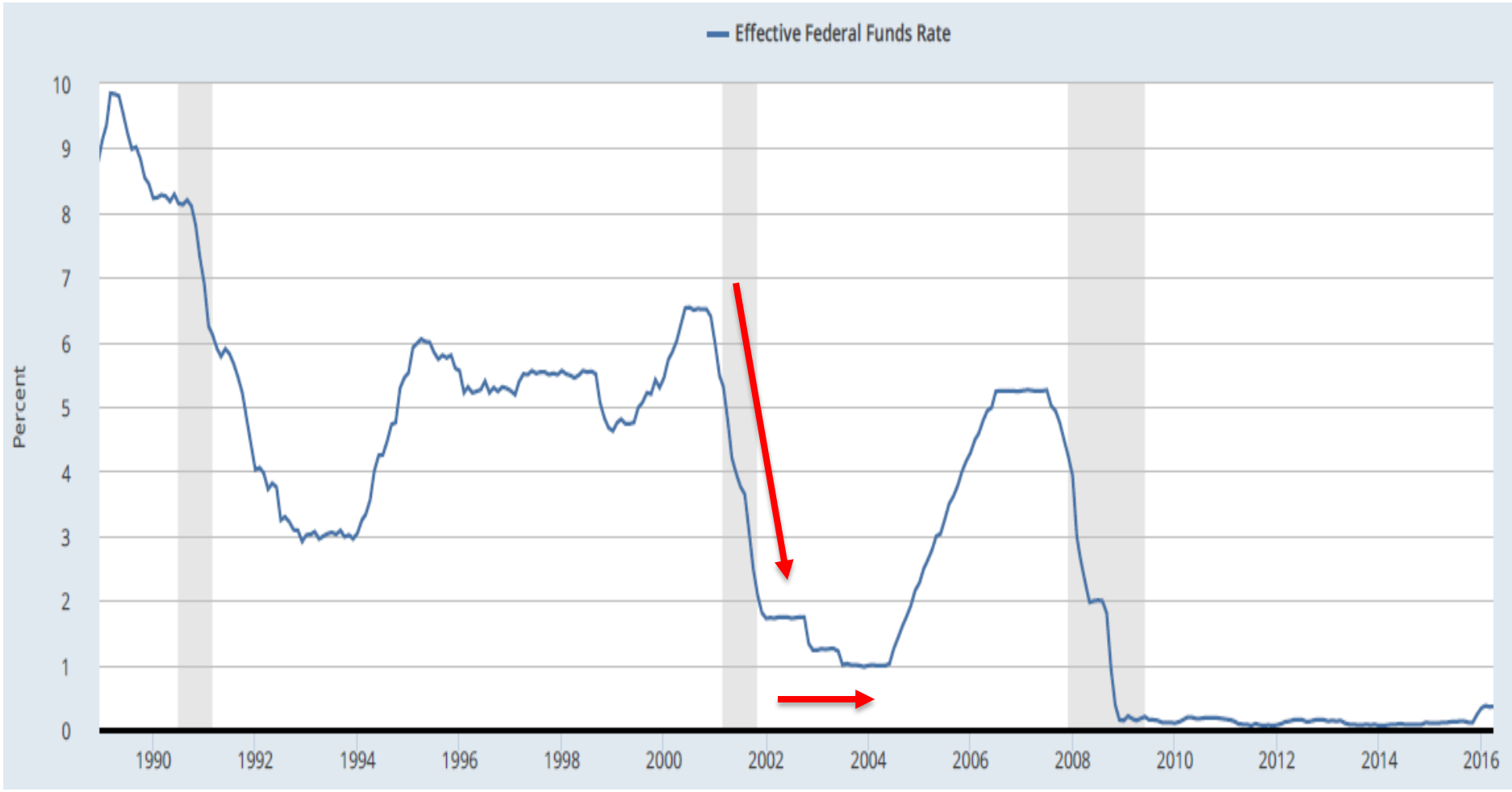
Sowing the seed of the GFC crisis

- Late 1990s, US stock market had grown rapidly
  - Driven by capital reversal
  - Japan crisis in (1990) + Asian crisis in (1997) + Russian crisis (1999) …
- Dot-com tech firm / Bubble

Market crash / Greenspan put

- Many Dot-com didn't survive as expected
- Bubble → bust/crash around 2001 → stock price plummet.
- **FED responded by cutting the FED fund rate.**
  - **Aggressively and kept it so low.**

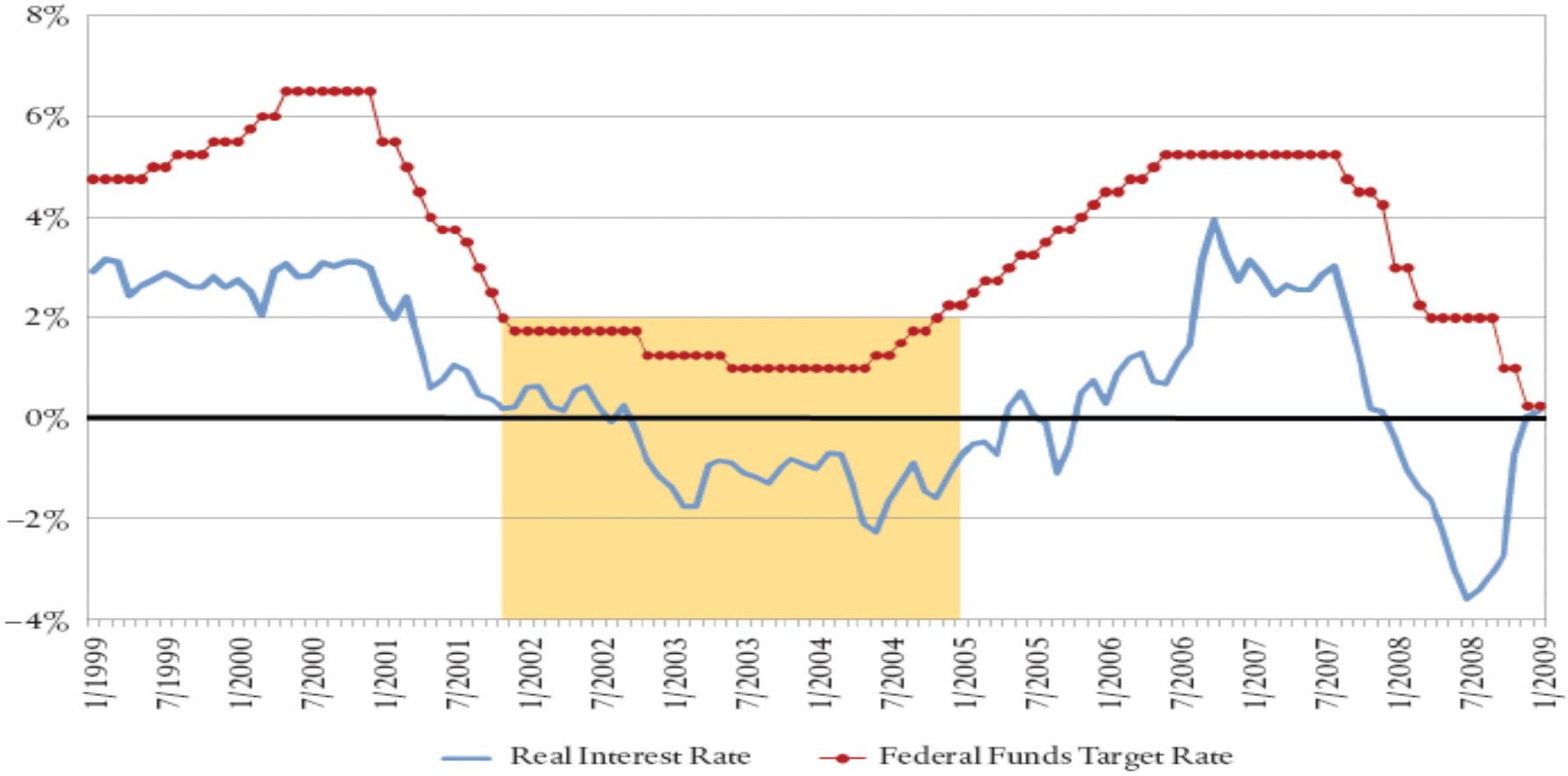
Fed aggressively cut FED fund rate after the Dot-com bust, and had kept their policy rate low for almost two years. (2003-2005)



US real interest rate < 0, 2003-04

 Source: Benn Steil, CFR, March 2009

FIGURE 1. U.S. REAL INTEREST RATE AND THE FEDERAL FUNDS TARGET RATE



Two years of low interest rate

- Capital ease in the US financial market; cheap money, abundant liquidity
- Consequences
  - **Search for high yield investment**
  - Where did they go? → real estate market and residential housing
  - Financial sector had concentrated more on loan created to housing market (in general)

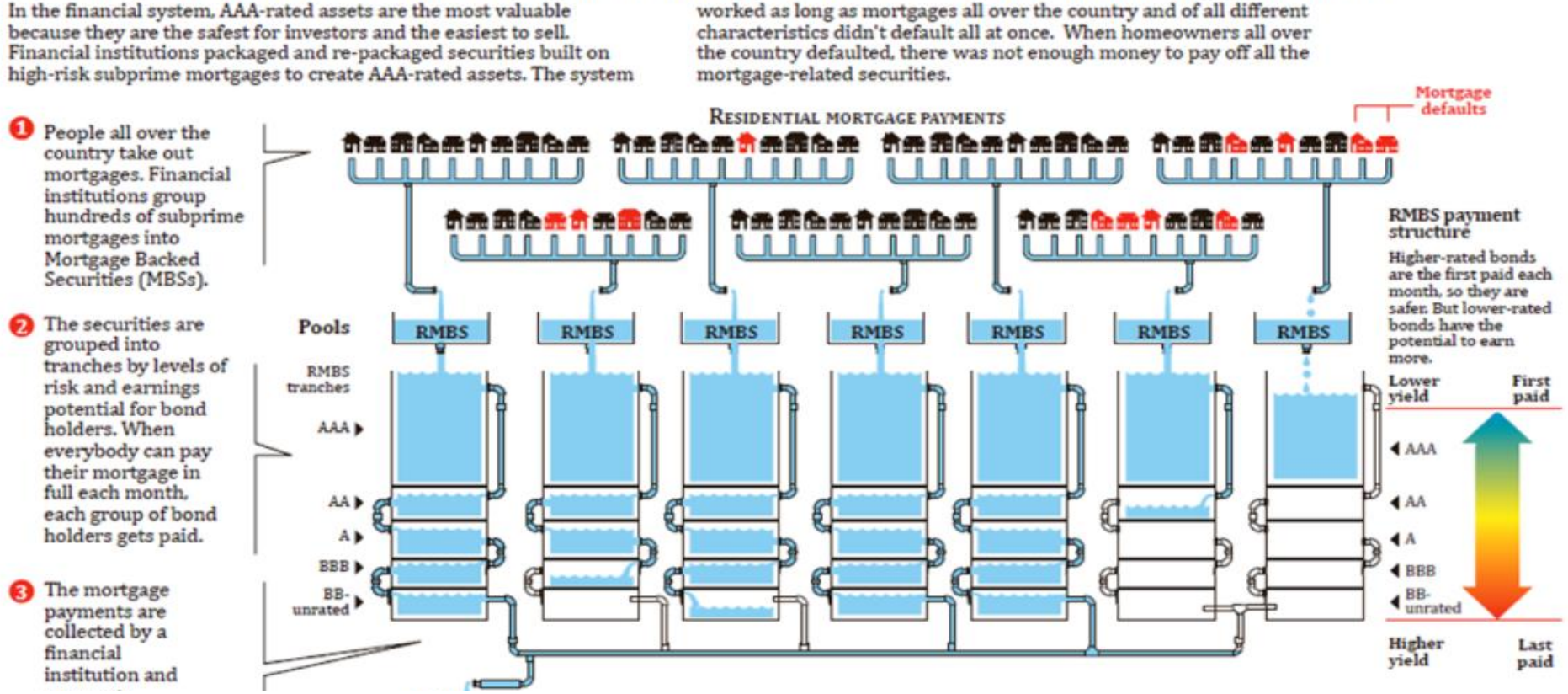
Two additional catalytic factors

- **Bush's policy** to grant more housing loan to first-time homebuyer and low income people
  - First-push by GSE (Fennie Mae and Freddie Mac)
  - Implications: "**Subprime market innovation**"
  - Aimed at providing housing finance to (disproportionately poor and minority) people with some combination of spotty credit histories, a lack of income documentation, or no money for a down payment.

Two additional catalytic factors

- **Financial deregulation and Securitization** allow the subprime market innovation to get created easier, and hence housing credit boom

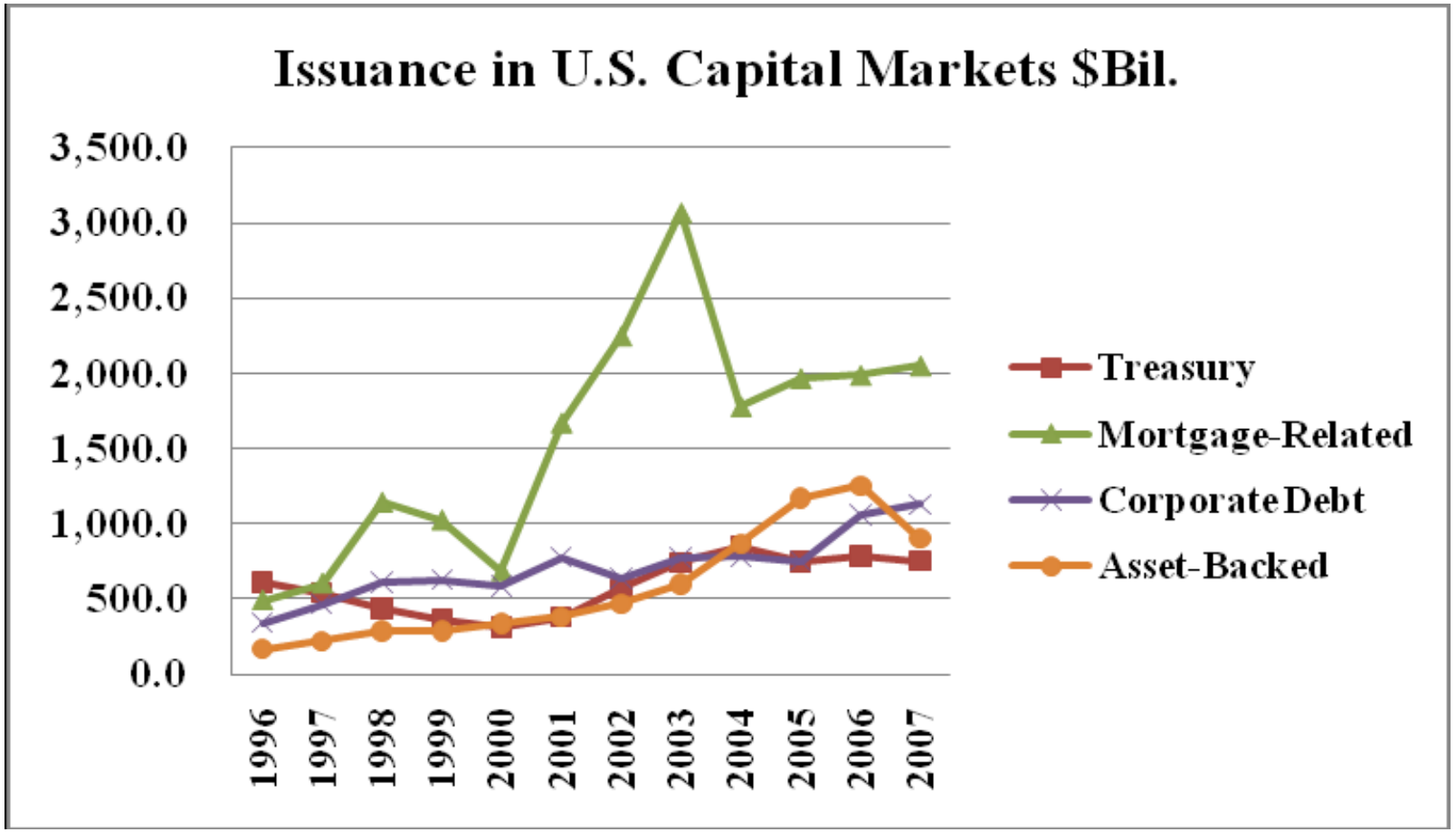
- The mortgages were sold in **residential mortgage-backed securities (RMBS)**



Technically, financial engineer can transform pools of subprime mortgage loan (bad quality loan) into high-graded asset through the securitization

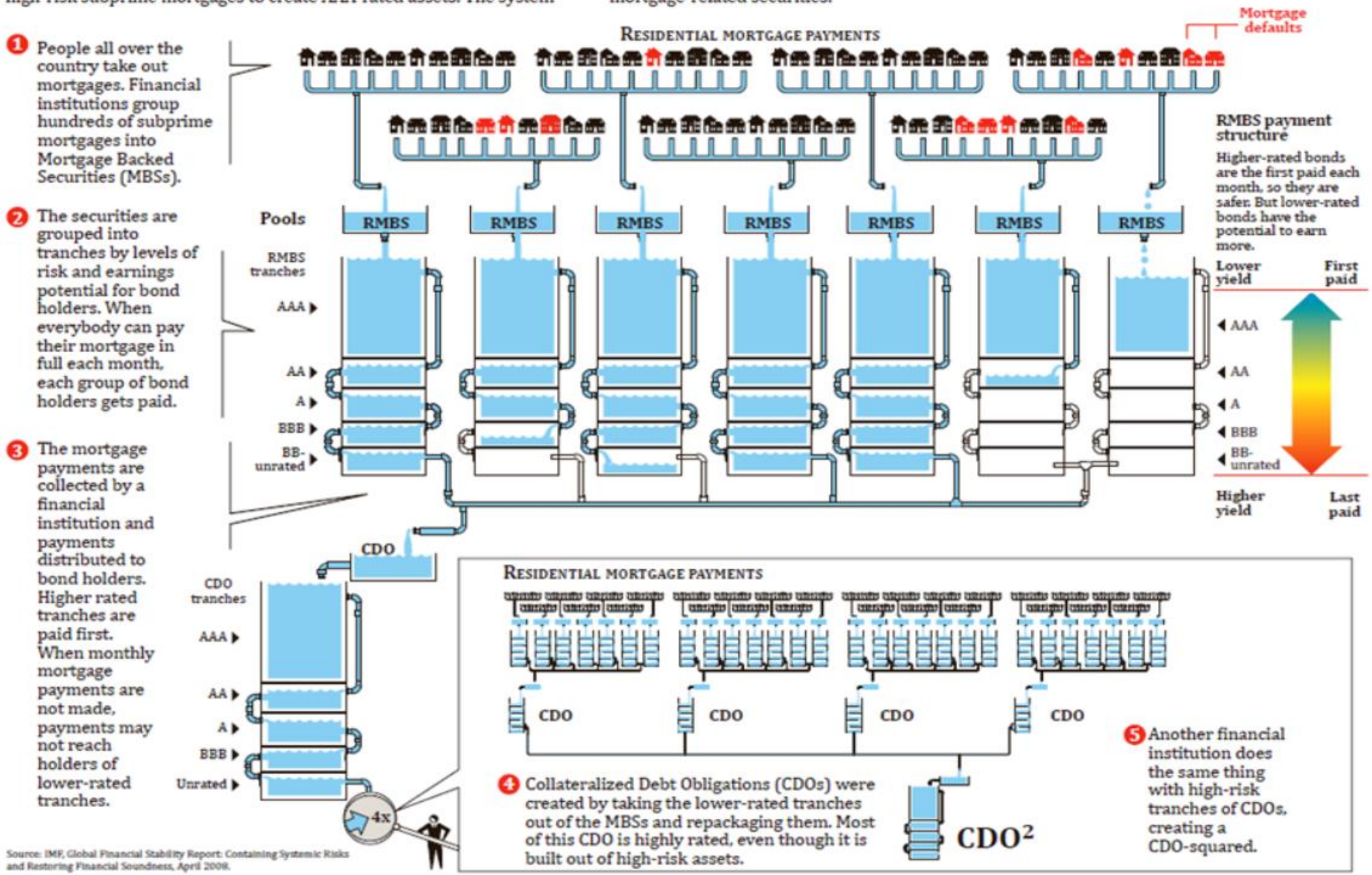
Practically, need to protect default risk by purchasing a type of financial derivative so called "Credit default Swap (from investment bank)"

New issuance increased a lot for MBS and ABS



The Theory of How the Financial System Created AAA-rated Assets out of Subprime Mortgages

In the financial system, AAA-rated assets are the most valuable because they are the safest for investors and the easiest to sell. Financial institutions packaged and re-packaged securities built on high-risk subprime mortgages to create AAA-rated assets. The system worked as long as mortgages all over the country and of all different characteristics didn't default all at once. When homeowners all over the country defaulted, there was not enough money to pay off all the mortgage-related securities.

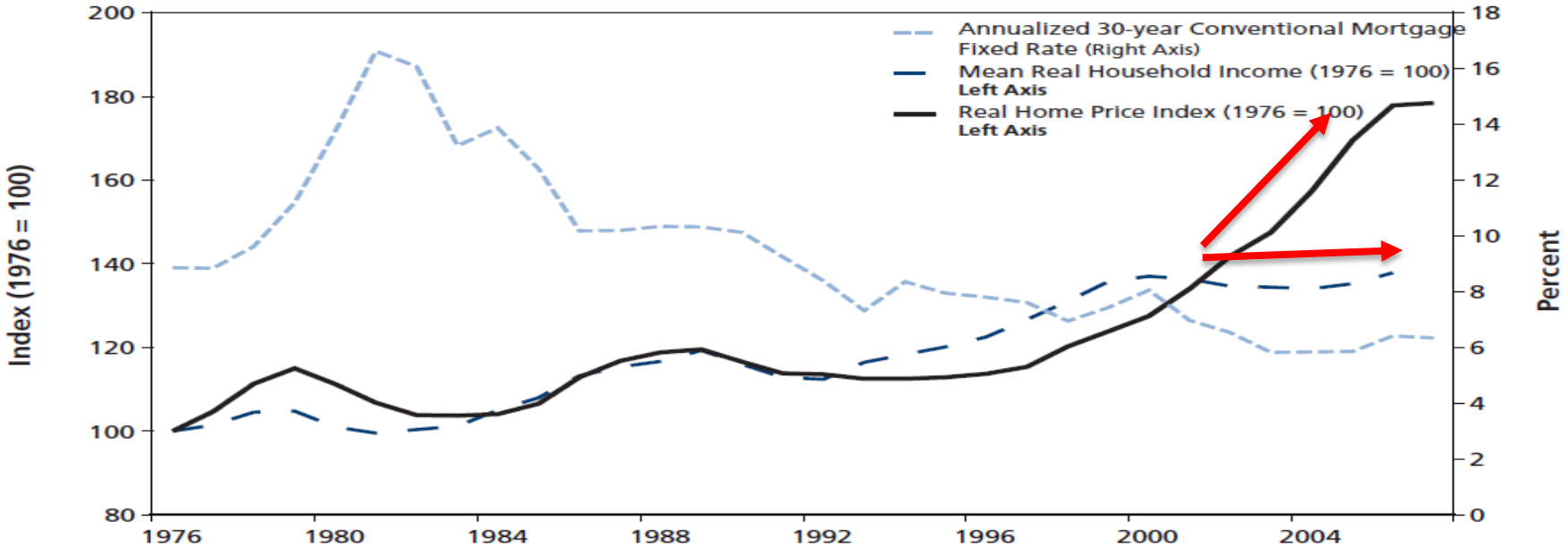


Source: IMF, Global Financial Stability Report: Containing Systemic Risks and Restoring Financial Soundness, April 2008.

The impact of securitized assets and the mother of all

- Asset price boom! → Further fueling the credit boom

FIGURE 1:
Real Home Prices and Real Household Income (1976=100); 30-year Conventional Mortgage Rate

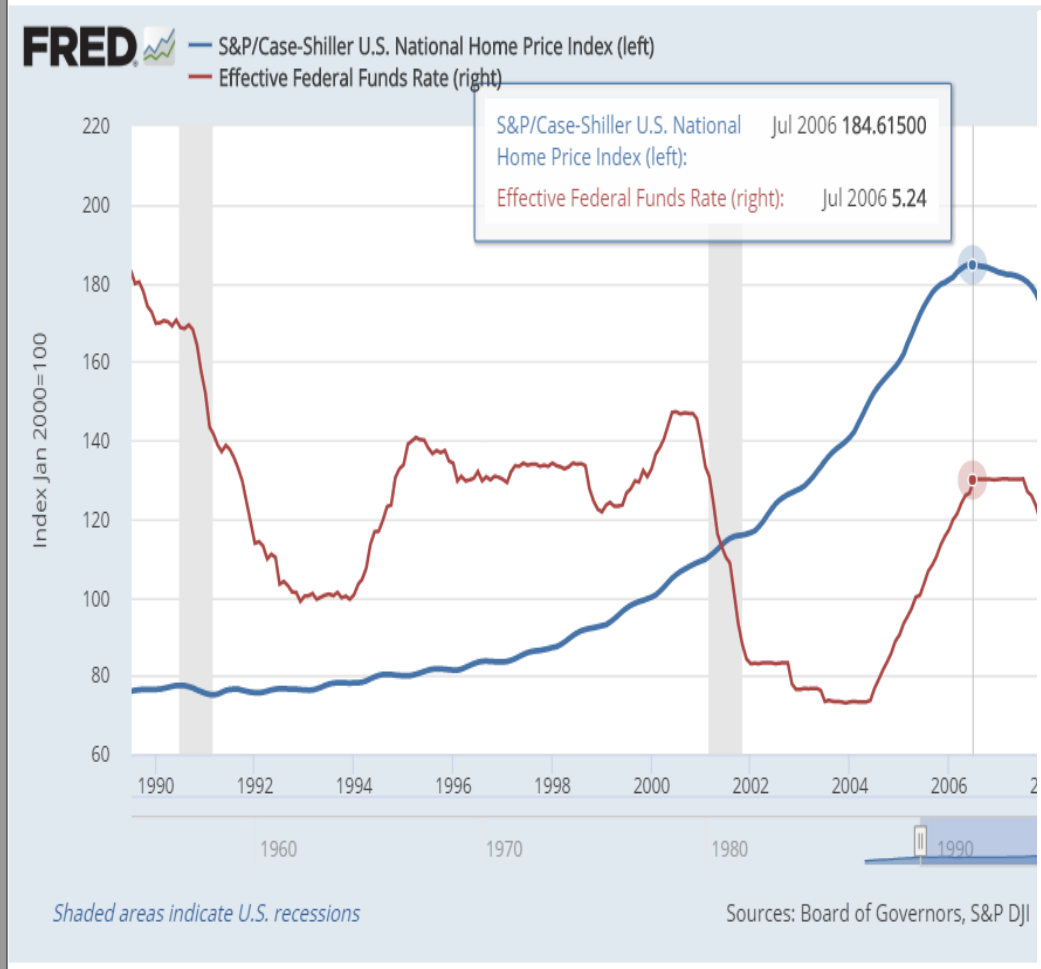


Source: OHFEO; Federal Reserve; Bureau of the Census. Home Prices and Income are deflated by CPI less Shelter.

The impact of securitized assets and the mother of all

- Changing on business model of financial intermediary sector from **Originate-and-hold to originated-to-Sell**
  - Securitized banking ***or*** Shadow banking
  - Using REPO financing: roll-over short-term debt to invest in securitized market
    - Mismatched maturity just like traditional banking

The end of Low interest rate, followed by high interest rate
House price began dropping since 2006



Consequence: Home delinquency rate / Default rate started to rise

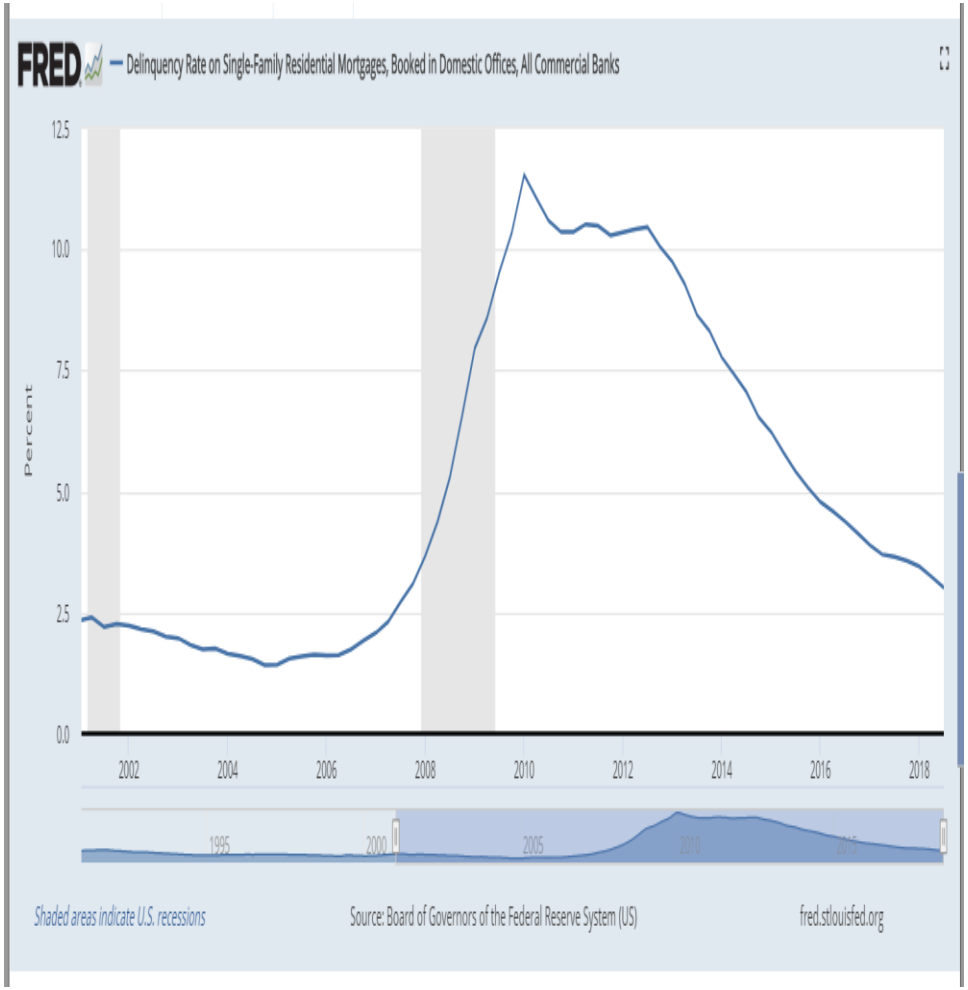
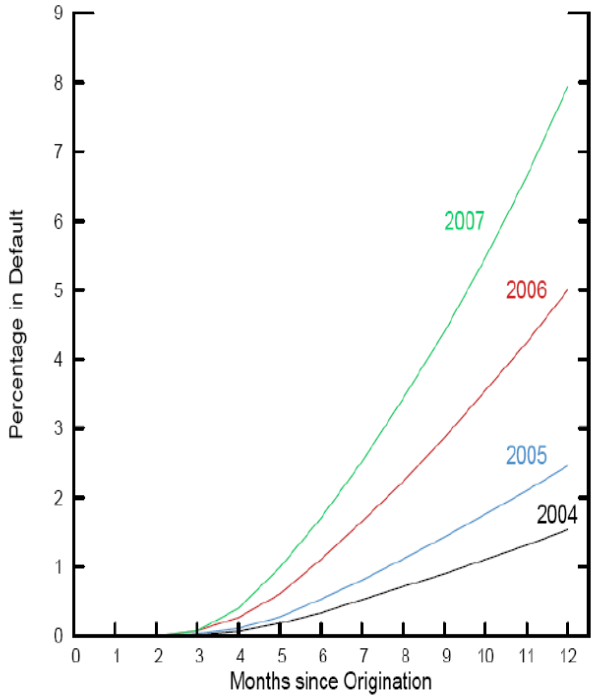


Figure 2
Early Payment Defaults on Subprime Loans

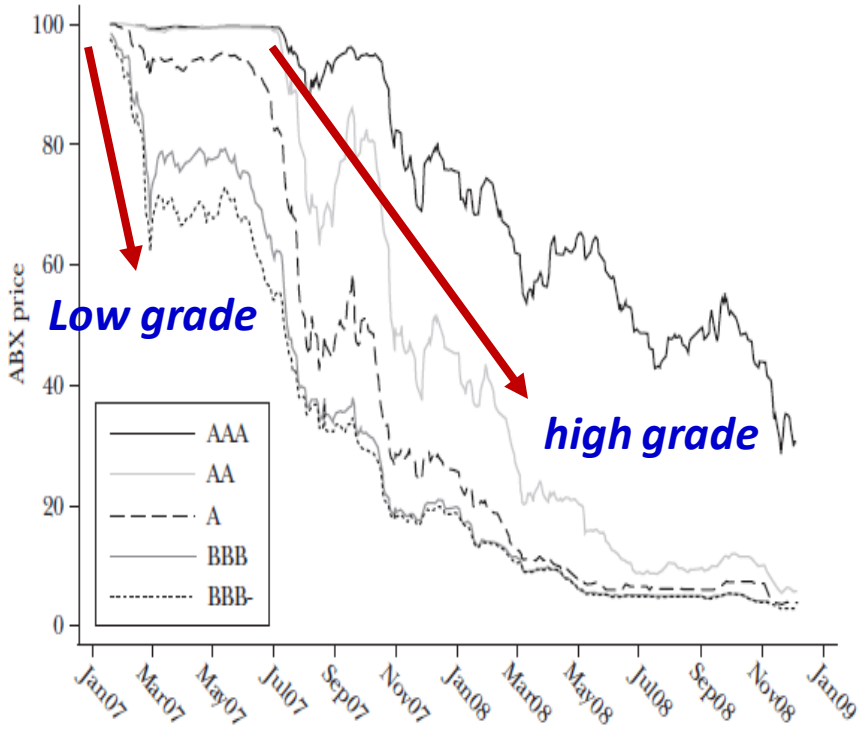


Source: Calculations from First American LoanPerformance data.
Note: Figure 2 shows the percentage of borrowers with subprime mortgages in the 2004, 2005, 2006, and 2007 vintages whose mortgage balances in a given number of months were in default. Sample restricted to thirty-year, first-lien mortgages originated on one- to four-family properties in the contiguous United States. Adjustments have been made for calendar effects.

The panic in Mid of 2007

- From late of 2006, market had started to observe some signal of home default in Subprime market; **higher than initially expected**
- Investors realized that **they had underpriced** the risk of MBS assets (and those related)
  - They started selling off the troubled asset
- Liquidity frozen / dried out

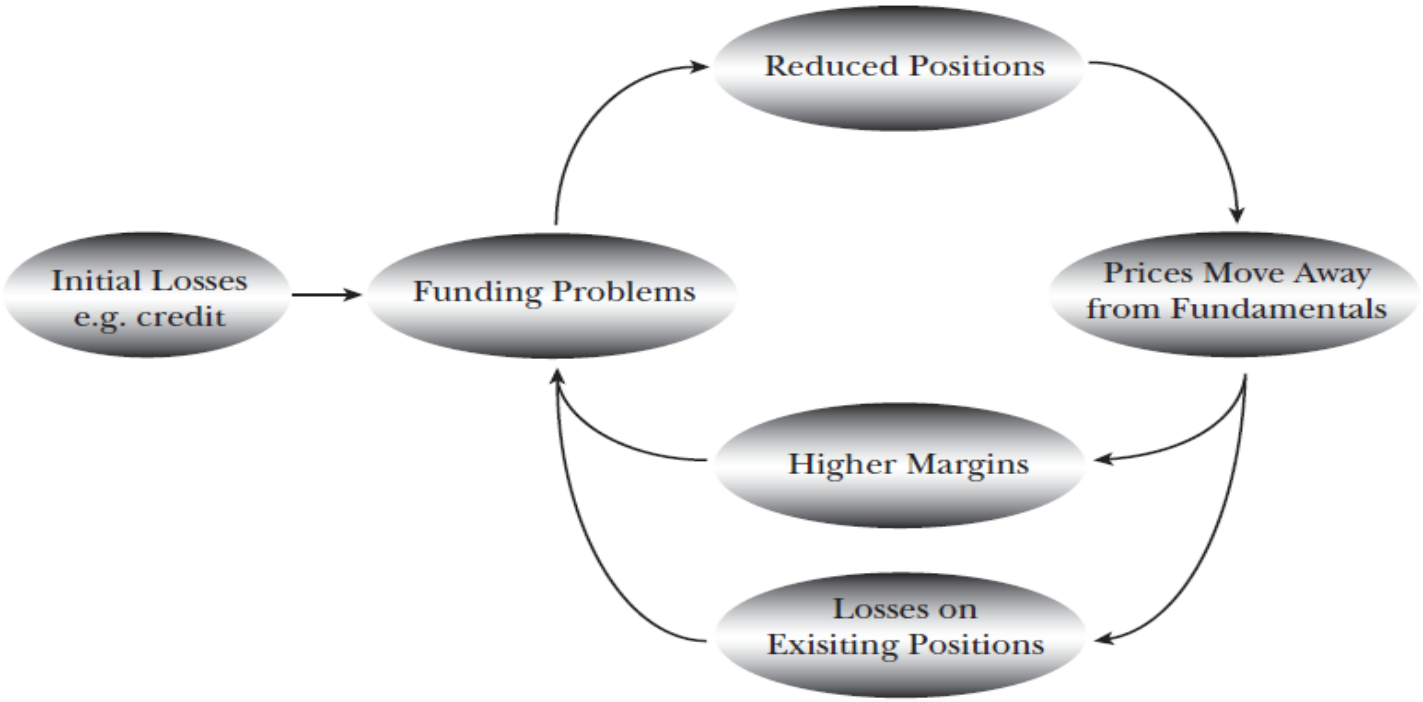
Figure 1
Decline in Mortgage Credit Default Swap ABX Indices
(the ABX 7-1 series initiated in January 1, 2007)



Liquidity spirals: Feedback interaction

Figure 4

The Two Liquidity Spirals: Loss Spiral and Margin Spiral



Source: Brunnermeier and Pedersen (forthcoming).
Note: Funding problems force leveraged investors to unwind their positions causing 1) more losses and 2) higher margins and haircuts, which in turn exacerbate the funding problems and so on.

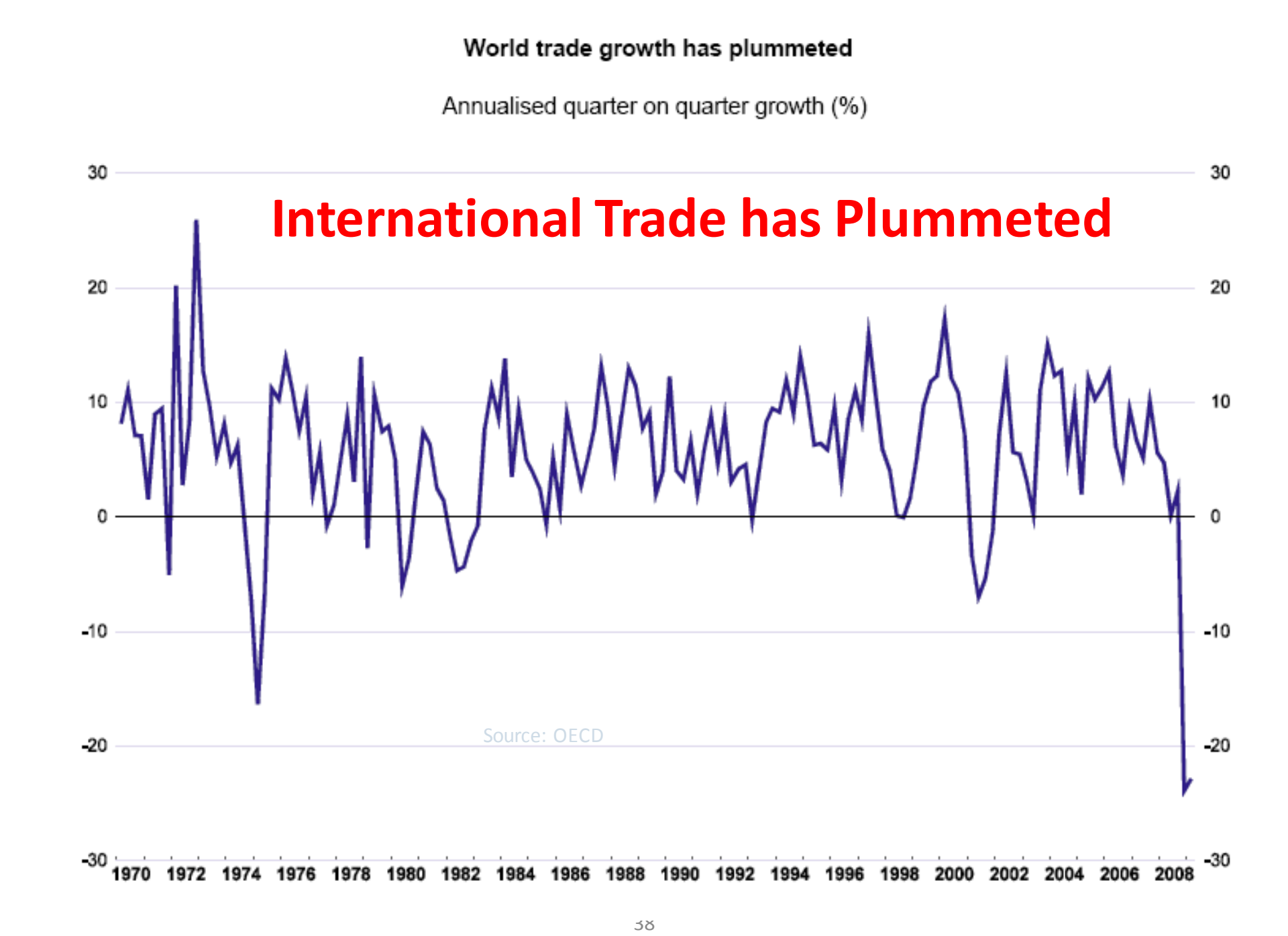
Disruption in the US financial sector on real sector

- Capital market crunch and Balance sheet effect
  - Wiped-out Household wealth; underwater problem → Hard to borrow → home price drops
  - Business sector → hard to secure loan

- Debt deflation problem

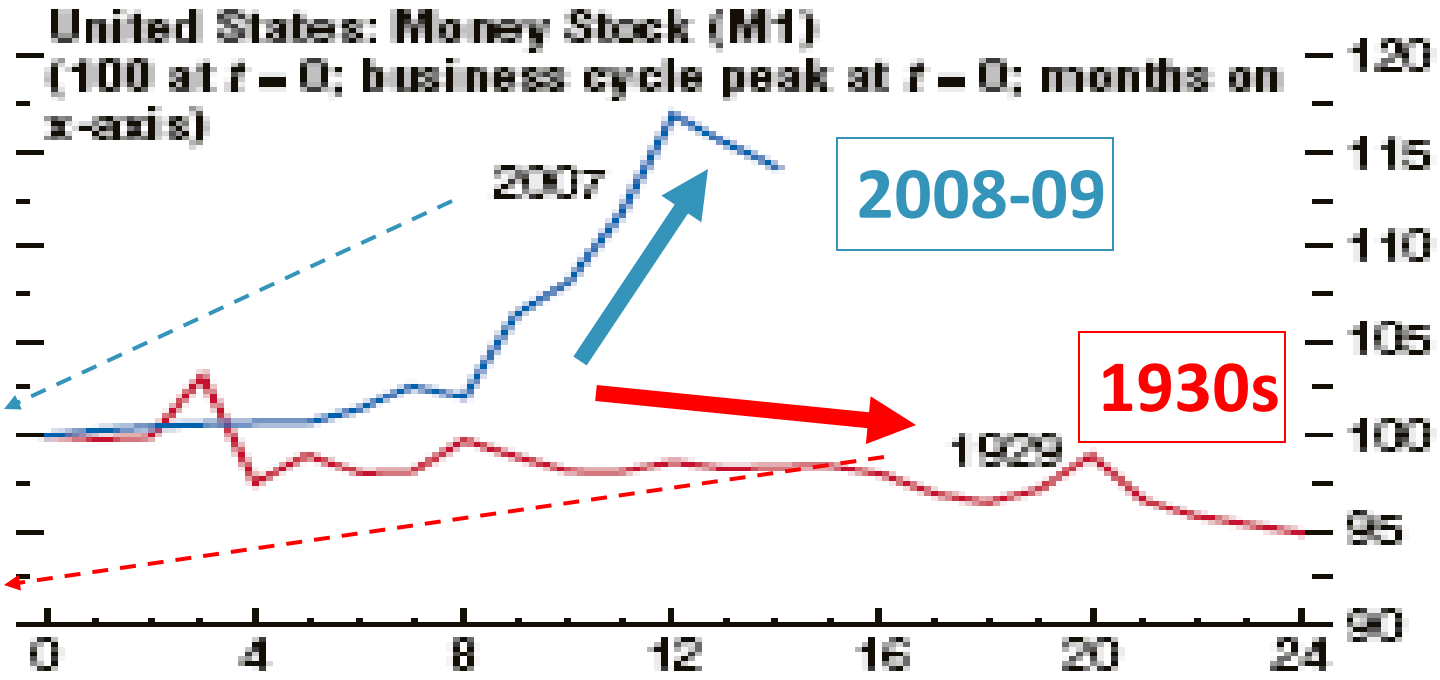
Recession was soon transmitted to rest of world:

- **Contagion:** Falling securities markets & contracting credit.
  - Especially in those countries with weak fundamentals: Iceland, Hungary & Ukraine…
  - Or oil-exporters that relied heavily on high oil prices: Russia…
  - But even where fundamentals relatively strong: Korea, Brazil…
- Some others experiencing their own housing crashes: Ireland, Spain…
- Recession in big countries was soon transmitted to all trading partners through loss of exports.


World trade growth has plummeted
Annualised quarter on quarter growth (%)
International Trade has Plummeted
Source: OECD
30
20
10
0
-10
-20
-30
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008

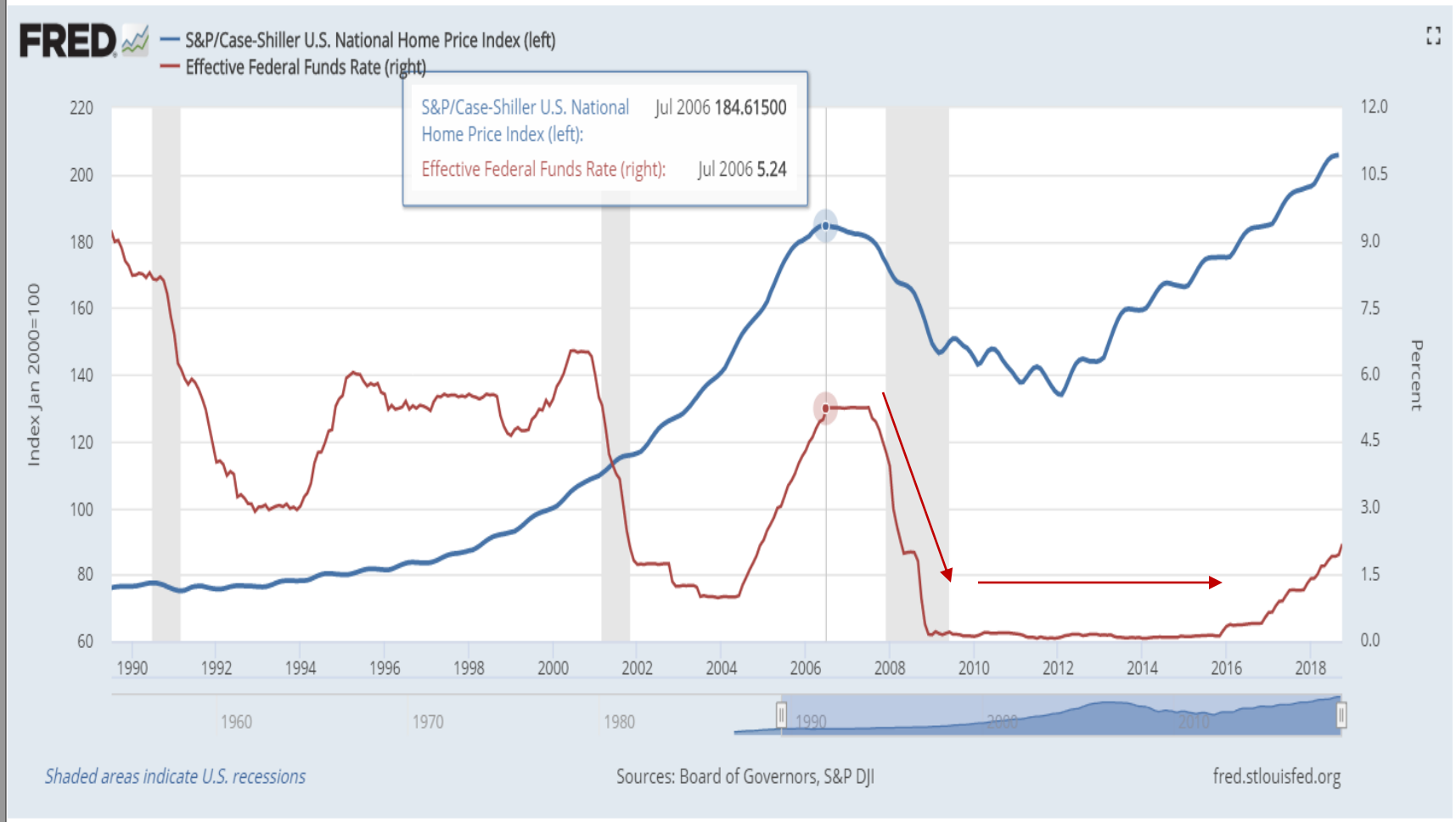
The Fed certainly didn't repeat the mistake of 1930s: letting M1 fall.

Countercyclical Policies and Output-Inflation Dynamics



Source: IMF, *WEO*, April 2009 Box 3.1

The new era of Quantitative easing



Policy responses

- Standard policy responses
  - Lower discount rate
  - Lower Fed fund rate.

- **Basic Implementation:** purchase short-term government bond

- Growing concern over the problem; FED had decided to take unconventional measures.
  - Often known as **quantitative easting policy**

Unconventional monetary policy QE1

- Oct. 2008: QE 1 = direct asset purchase
  - Conventional = government bond
  - Unconventional = private security; MBS asset.

- TARP program (troubled asset relief program)

- Objective: stabilize the problem; **reduce credit spread.**
  - Central bank takes risk for the private.

Unconventional monetary policy QE2

- Nov. 2010: Purchase Long-term bond
- Objective: lower Long-term rate
  - Lower Term premium
  - Absorbing risk from the financial system
- Balance sheet has comprised of large fraction of long-term bond.
  - An **implicit signal/commitment** that FED will unlikely raise the FED fund rate.

Unconventional monetary policy QE3

- Sept 2012: commitment an injection of liquidity in every quarters.

- Forward guidance / **explicit commitment**
  - Fed will now increase FED fund rate if unemployment is still over 6%.
  - Promise market to extend their low interest rate policy until 2015.

Agenda

- Historical episode of crisis:
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- In the wake of Global financial crisis: what have we learned?

What have we learned

1. **Excessive borrowing is dangerous**

2. Monetary policy and inflation targeting

3. Policy space is important

Excessive borrowing is dangerous

- Excessive borrowing (HHs or Firms) leads to "systematic" collapse of financial sector → perils to real economy and overall stability
- Avoid this fueling the credit boom with more appropriate financial regulation
- Basel III Micro-prudential → macro-prudential
  - Counter Cyclical buffer capital → dampen pro-cyclicality
  - LTV cap
  - Leverage Cap

Monetary policy and inflation targeting

- Should monetary policy only aim at keeping monetary system stable?
  - Monetary stability = low inflation / stable output
  - Last decade prior to the GFC, central banks had been successful in maintaining monetary stability
  - Then, we had been hit by crisis
- Post crisis, should we also look at something else, **financial stability or asset price targeting?**

Monetary policy and inflation targeting

- Pros:
  - Monetary stability **does not imp**ly financial stability
  - There are some benefits from Lean Against the Wind (LAW)
  - Credit boom, and hence asset price bubble, should be coped with monetary policy → significantly lower the probability of financial crisis
- Cons
  - Yes, but bubble might be created in some particular market
  - Use, macro-prudential → "division of labor"

Policy space is important!

- Monetary policy space
  - Zero-lower bound is costly
  - Setting too low interest leaves us small room to pursue expansionary policy when needed!

- Fiscal policy space
  - Effect of fiscal policy is SO powerful too under recession
  - Whether we can use depends on fiscal space
    - Greek/Portugal needed to use the "Austerity" as they had over-accumulated the debt before the crisis