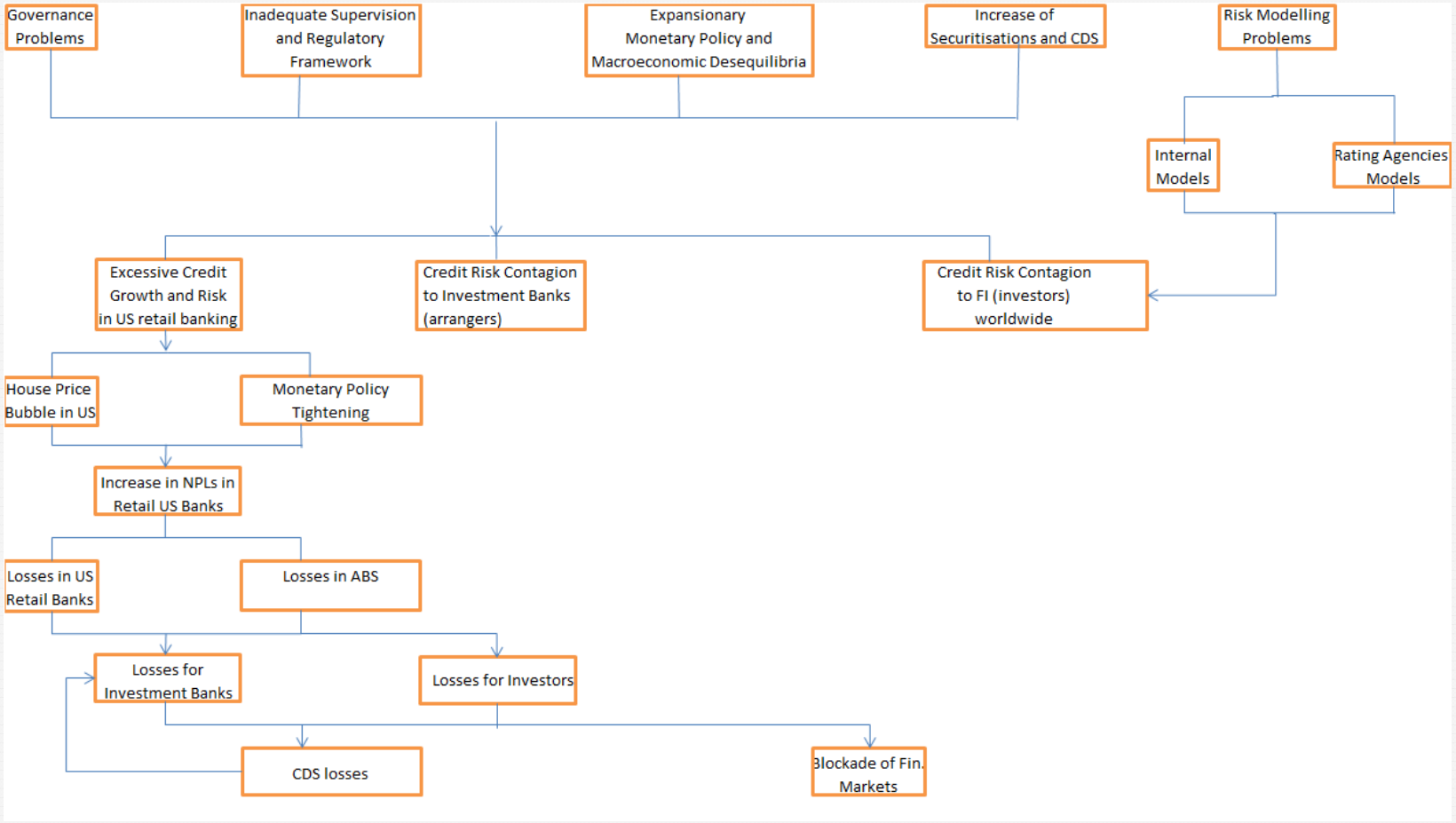
1.3. The Subprime Crisis

1.3.1. General Characterization

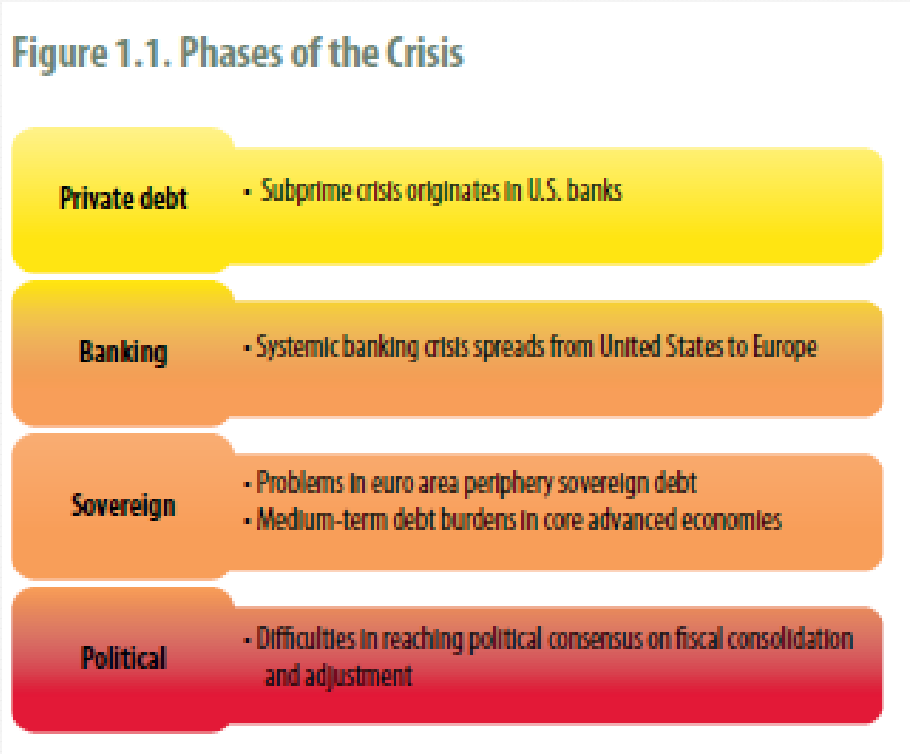
Anatomy of the crisis

- It was triggered by the <u>combination of many factors:</u>



International financial crisis

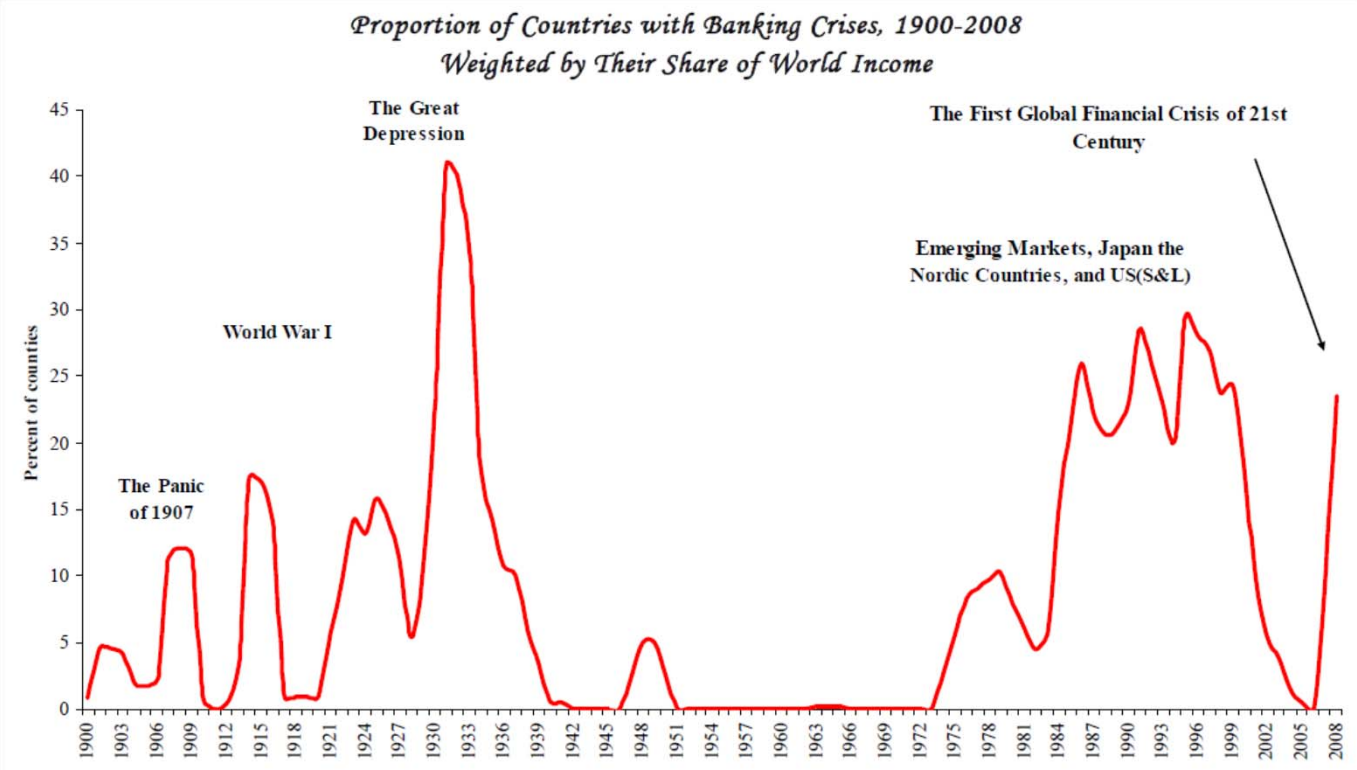
- The Subprime Crisis was a major international financial crisis started in the US residential mortgage market and spread worldwide.



Source: IMF (2011), "Global Financial Stability Report", Sep.

International financial crisis

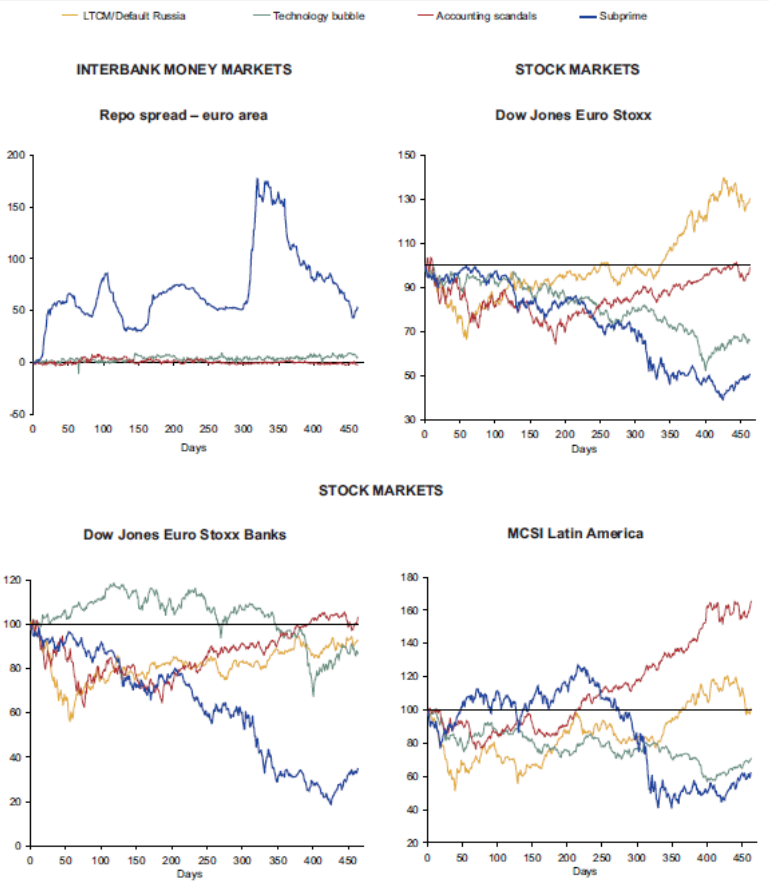
- The subprime crisis impacted significantly on many countries, even though it was not the only recent major financial crisis.



Source: Reinhart, Carmen M. and Vincent R. Reinhart (2010), "After the fall", FRBKC Jackson Hole Symposium Proceedings, August.

International financial crisis

- It also impacted on several asset classes.

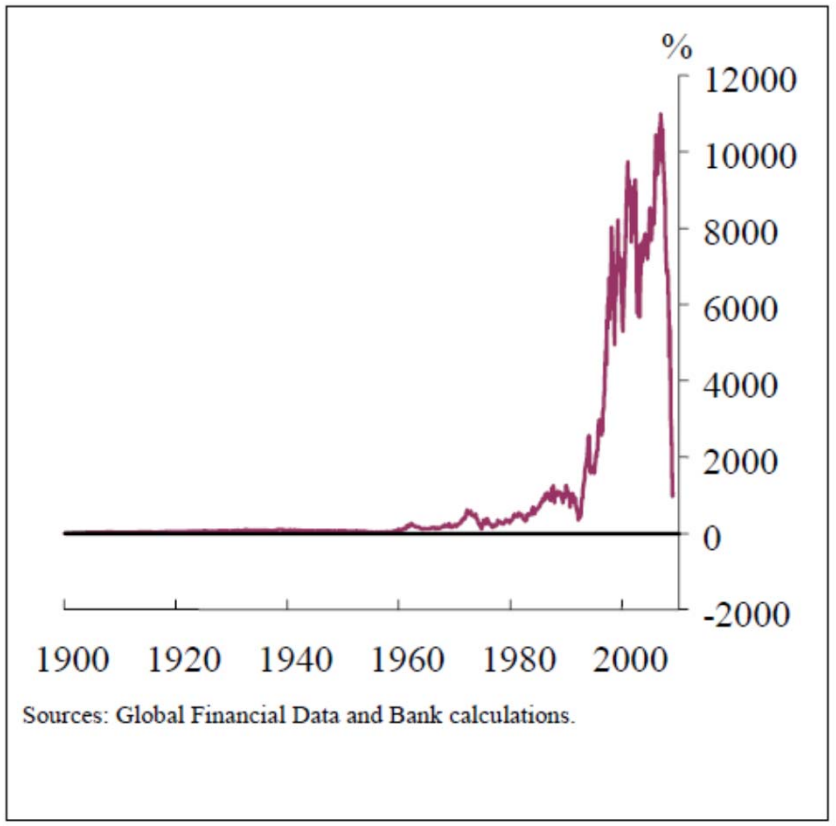


Source: ECB (2010 and 2009) , Financial Stability Review.

International financial crisis

- An investment in UK financial sector equities in 1900 would have produced an average return of 2% until 1985.
- In the following 20 years, the average return in the financial sector reached 16%.
- The subprime crisis almost eliminated those gains (cumulative fall of UK bank shares exceeding 80%, above the fall after the 1st oil price shock in 1973/74 and the stock market crash of 1929).

Chart 1: Cumulative excess returns to finance

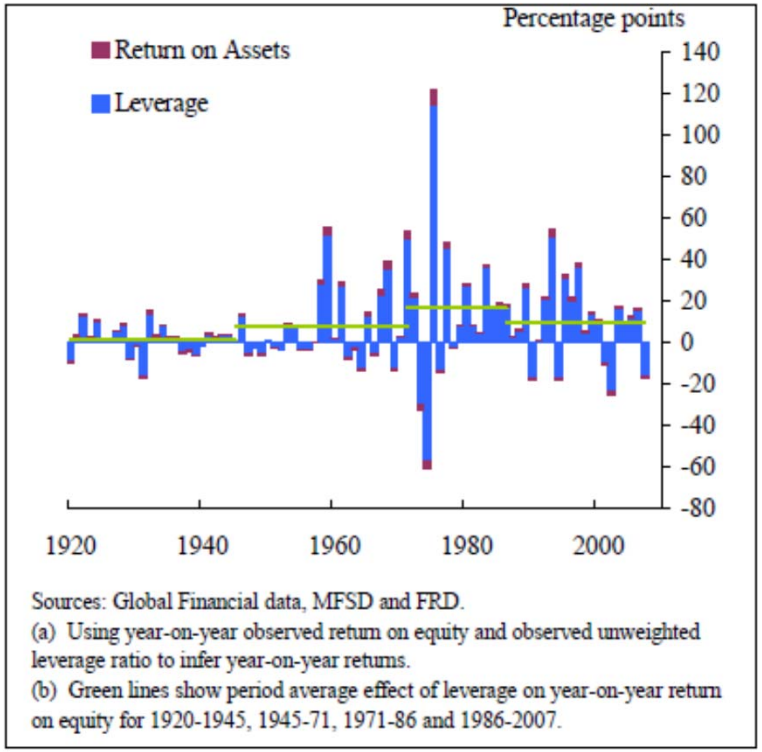


Source: Haldane (2009), "Small Lessons from a Big Crisis".

Leverage

- Much of the profitability generated in the 20 years before the subprime crisis resulted from the increase in leverage.

Chart 2: Contributions to year-on-year UK financial equity returns



Sources: Global Financial data, MFSD and FRD.
(a) Using year-on-year observed return on equity and observed unweighted leverage ratio to infer year-on-year returns.
(b) Green lines show period average effect of leverage on year-on-year return on equity for 1920-1945, 1945-71, 1971-86 and 1986-2007.

Source: Haldane (2009), "Small Lessons from a Big Crisis".

Funding

- The funding conditions were more aggravated for FIs than for non-financial companies.

Chart 3.6 Financial and non-financial corporate bond spreads in the euro area

(Jan. 2007 – May 2008; basis points)

Source: Reuters.

Chart 3.7 iTraxx main and senior financials indices

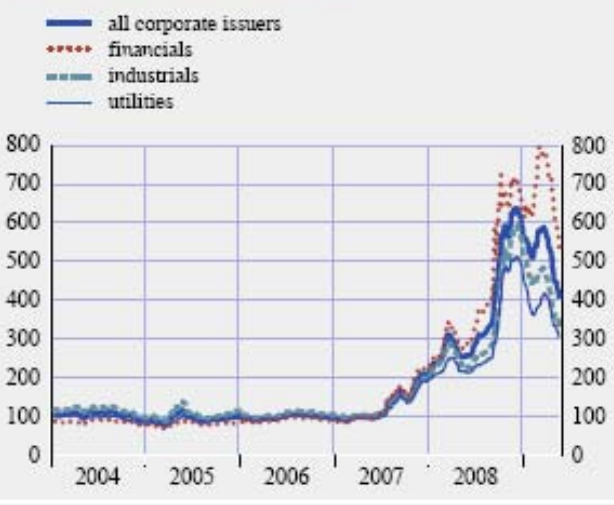
(Jan. 2005 – May 2008; basis points; five-year maturity)

Source: Bloomberg.

Source: European Central Bank (2008), "Financial Stability Review 2007".

Chart 1.15 US corporate bond spreads in various sectors

(Jan. 2004 – May 2009; basis points)



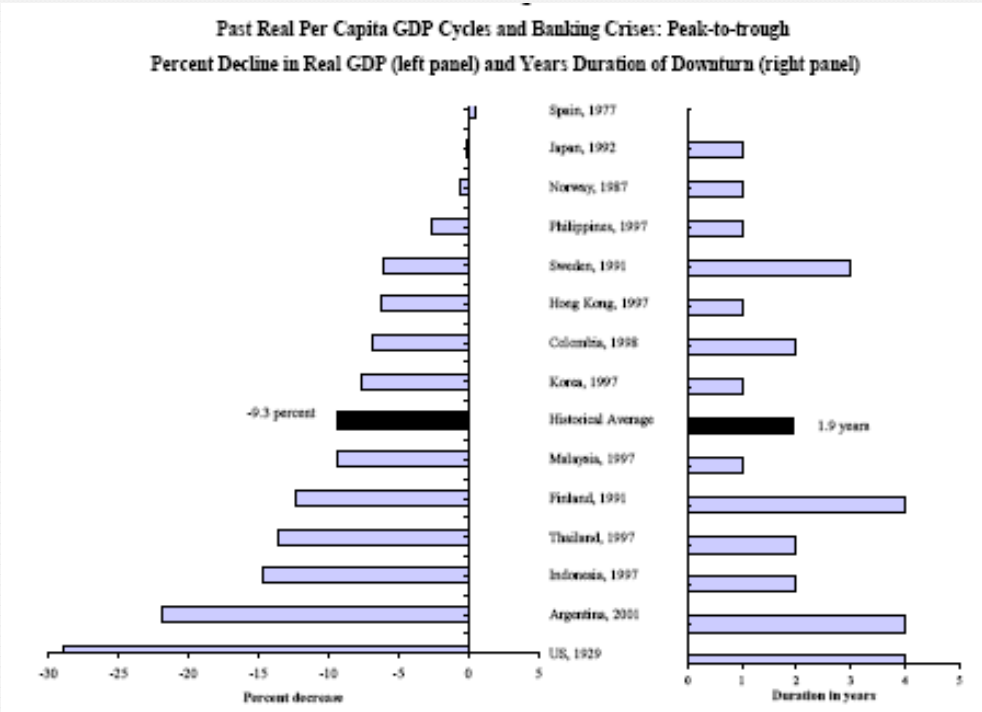
Sources: Merrill Lynch and Bloomberg.

Source: European Central Bank (2009), "Financial Stability Review 2008".

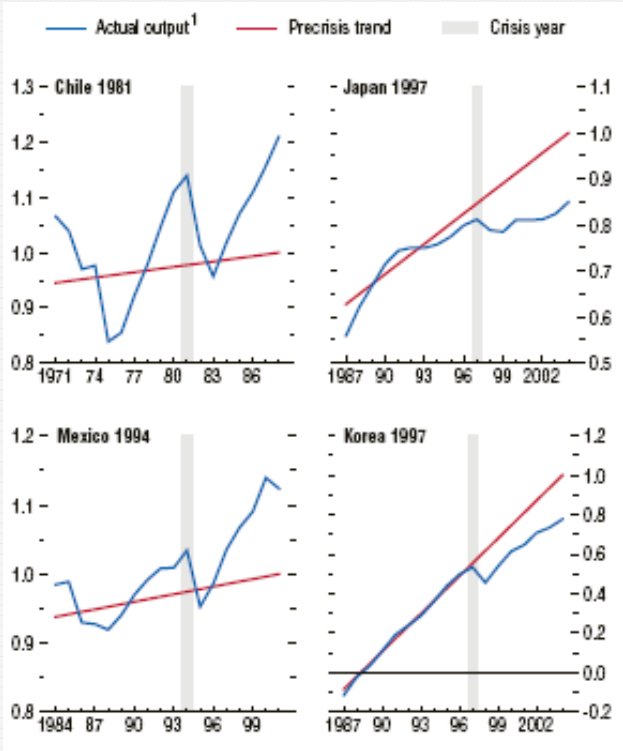
1.3.2. Historical Context

GDP

- Historically, financial crisis lead to severe and protracted output losses.
- According to Reinhart et al. (2012), public debt overhang episodes are associated with lower growth, with 20 in 26 episodes among advanced economies since 1800 assessed lasting more than a decade, ...



Source: Reinhart, Carmen M. and Kenneth S. Rogoff (2009), "The Aftermath of Financial Crises", American Economic Review, Vol. 99, No.2, May.

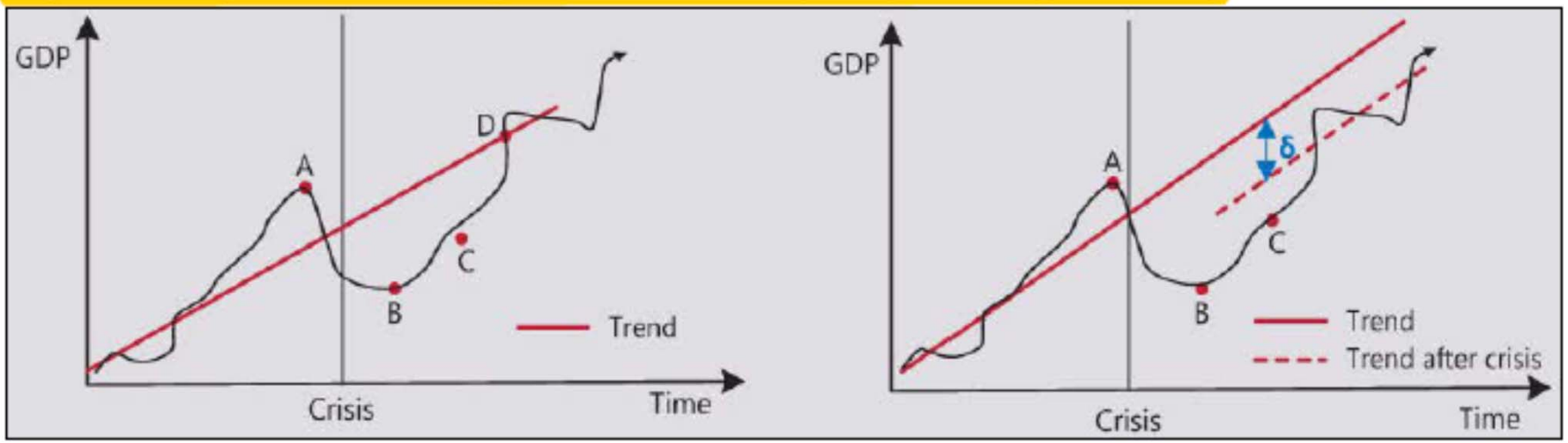


Source: IMF (2009), "World Economic Outlook".

GDP

- …, thus shifting downwards the trend level of GDP growth, …

Figure 2 Output loss following a financial crisis *(as a percentage of GDP)*

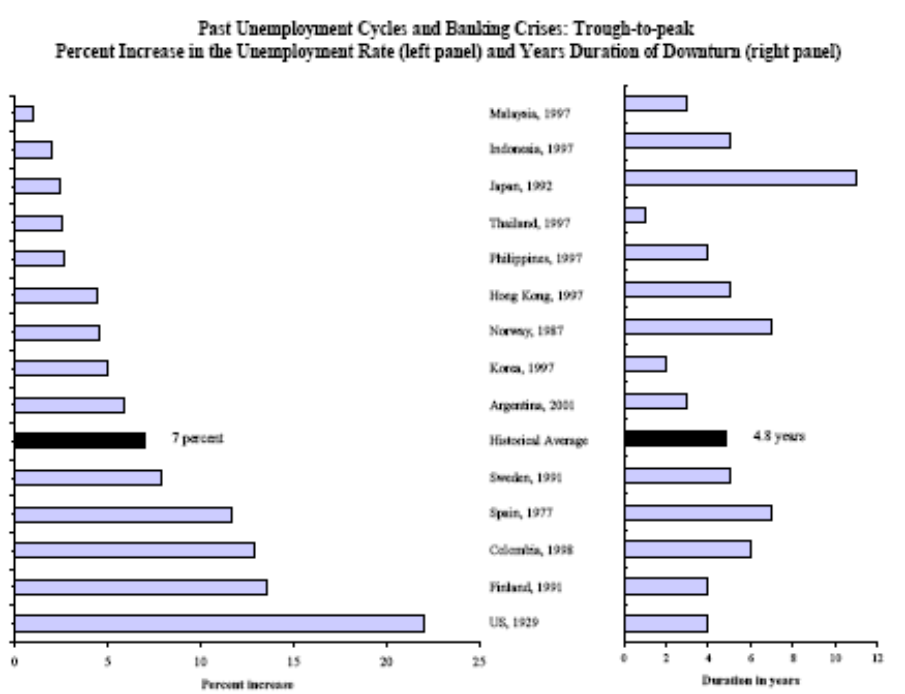


Note: Point A: pre-crisis peak. Point B: post-crisis trough. Point C: GDP growth equals trend GDP growth for the first time following the crisis. Point D: the level of GDP returns to the pre-crisis level.

Source: ESRB (2017), "Resolving Non Performing Loans in Europe".

Unemployment

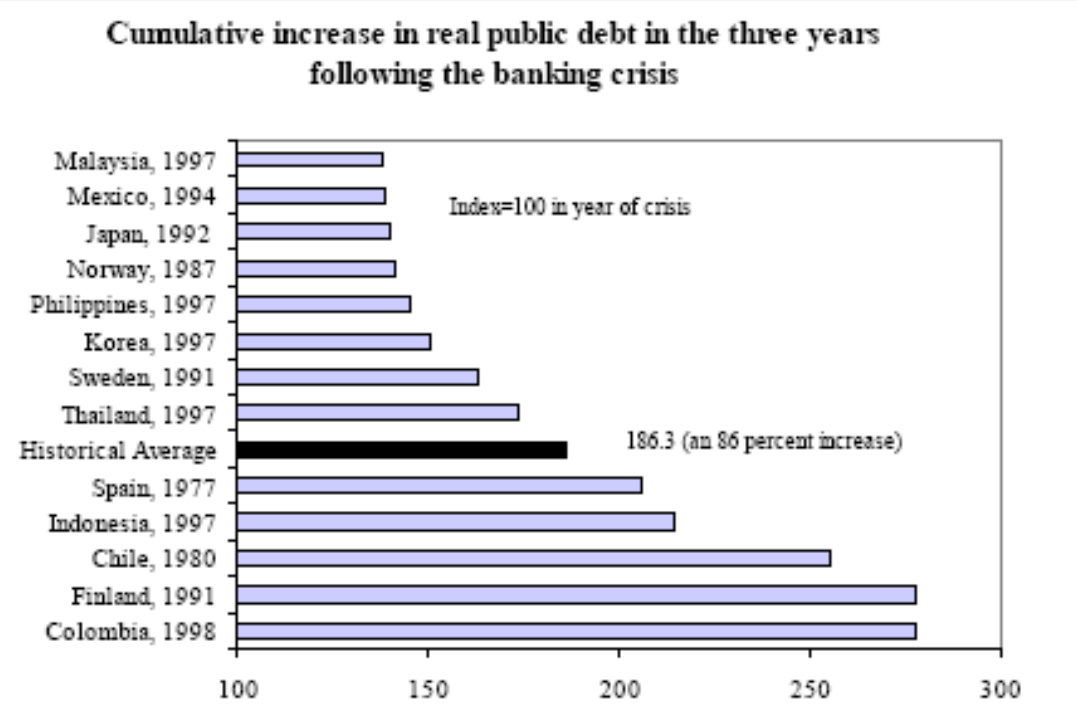
- … as well as impacting adversely on unemployment …



Source: Reinhart, Carmen M. and Kenneth S. Rogoff (2009), ”The Aftermath of Financial Crises”, American Economic Review, Vol. 99, No.2, May.

Government Debt

- … and public debt.



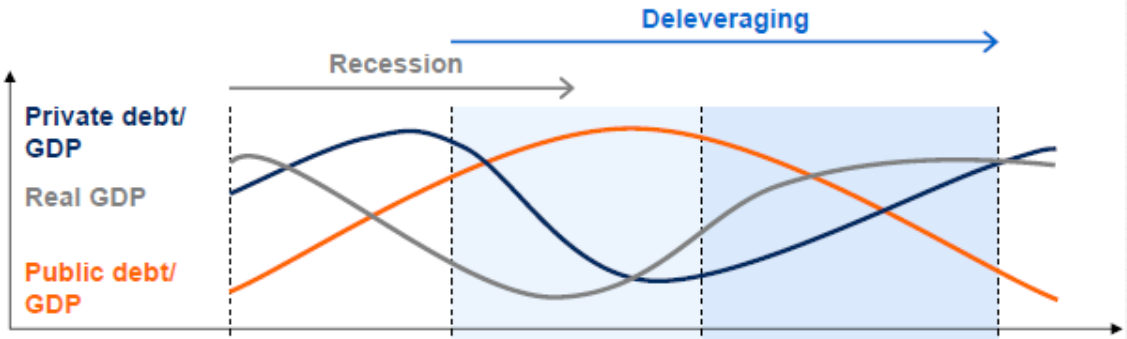
Source: Reinhart, Carmen M. and Kenneth S. Rogoff (2009), ”The Aftermath of Financial Crises”, American Economic Review, Vol. 99, No.2, May.

Deleveraging

- Typically, deleveraging processes after financial crisis are long, namely for public debt, …

Deleveraging typically begins in the private sector, even as government debt continues to grow

Average of Swedish and Finnish deleveraging episodes



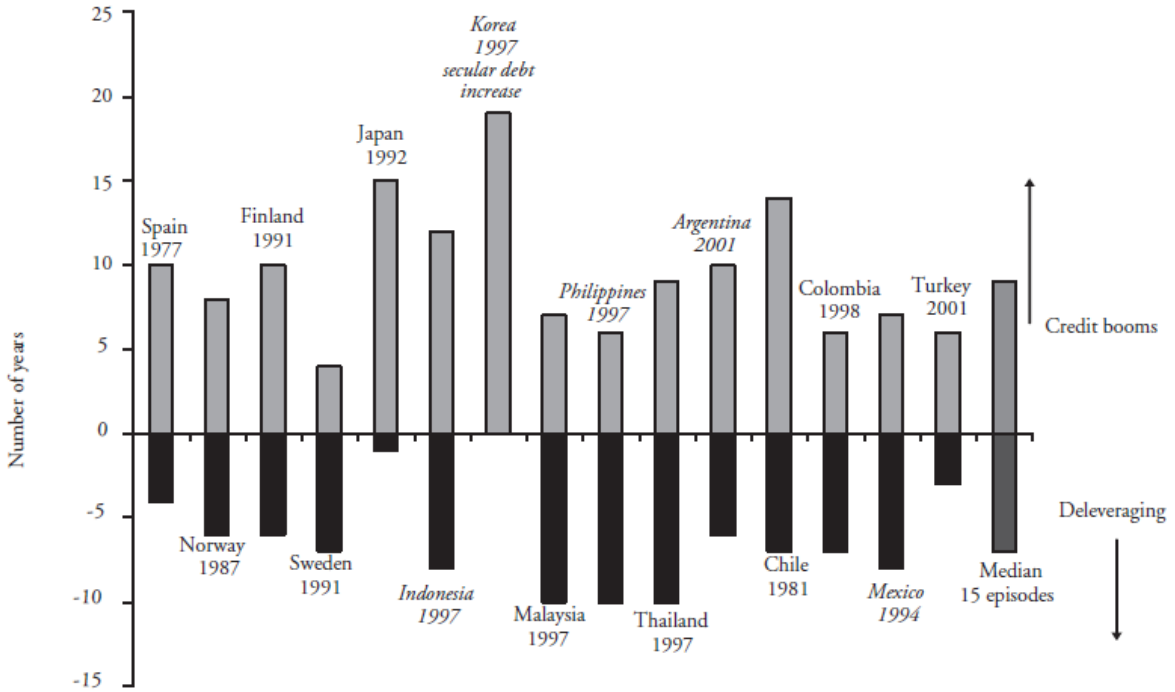
	Pre-crisis period	Early stage of recession	Private-sector deleveraging	Rebound and public-sector deleveraging
	10 years	1–2 years	4–6 years	~10 years
Real GDP growth Annual average (%)	3%	-3%	1%	3%
Change in debt/GDP Percentage points				
▪ **Private sector**	60	8	-26	87
▪ **Public sector**	3	15	21	-30

Source: McKinsey (2012), "Debt and deleveraging: Uneven progress on the path to growth", Jan.

Deleveraging

- … with deleveraging after credit booms taking up to 10 years ...

Domestic Banking Credit/GDP 10 Years Before and 10 Years After Severe Financial Crises: Duration of Boom-Bust Credit Cycles in 15 Post-World War II Episodes

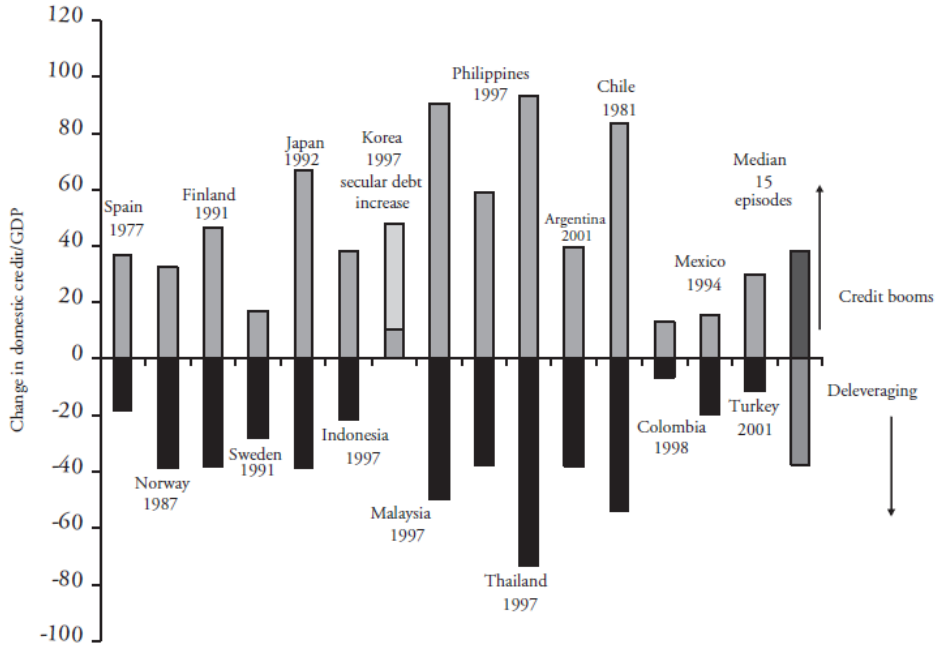


Source: Reinhart, Carmen M. and Vincent R. Reinhart (2010), "After the fall", FRBKC Jackson Hole Symposium Proceedings, August.

Deleveraging

- … and involving severe decreases in bank credit, after huge credit increases – **Boom and Bust**.
- Private Credit/GDP more than tripled in 1950-2006.
- In the 2 decades before 2008, in most advanced economies credit grew yearly by 10-15%.

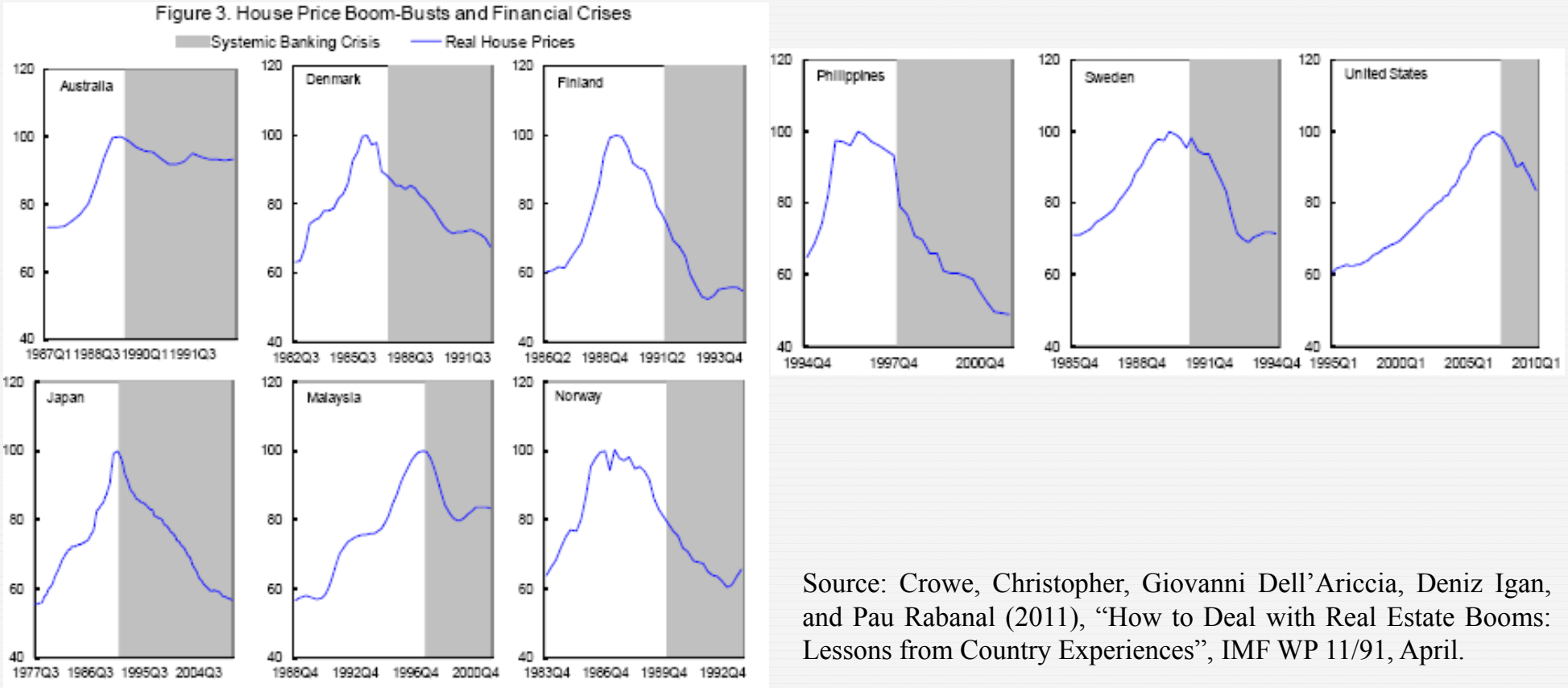
Domestic Banking Credit/GDP 21 Years Around Severe Financial Crises: Amplitude of Boom-Bust Credit Cycles in 15 Post-World War II Episodes



Source: Reinhart, Carmen M. and Vincent R. Reinhart (2010), "After the fall", FRBKC Jackson Hole Symposium Proceedings, August.

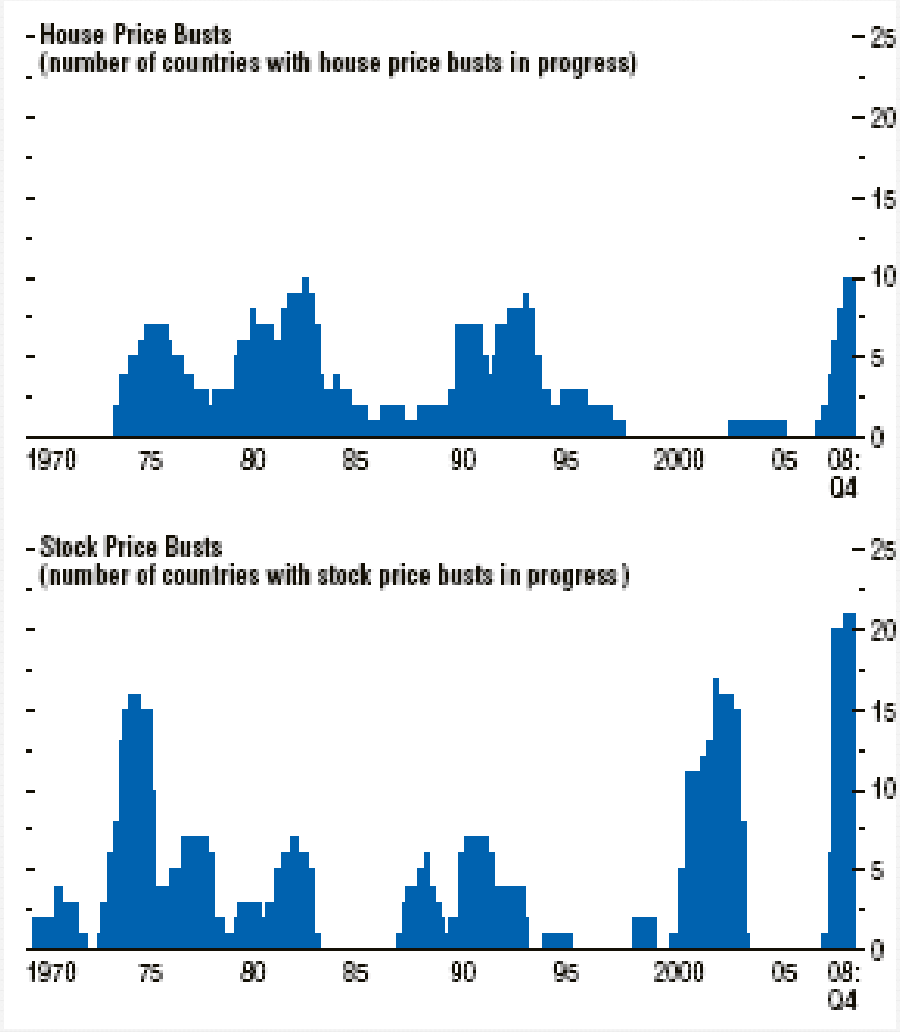
Real Estate

- Several previous financial crisis were triggered by bubbles in the real estate market, that led to severe price falls afterwards:



Source: Crowe, Christopher, Giovanni Dell'Ariccia, Deniz Igan, and Pau Rabanal (2011), "How to Deal with Real Estate Booms: Lessons from Country Experiences", IMF WP 11/91, April.

Real Estate

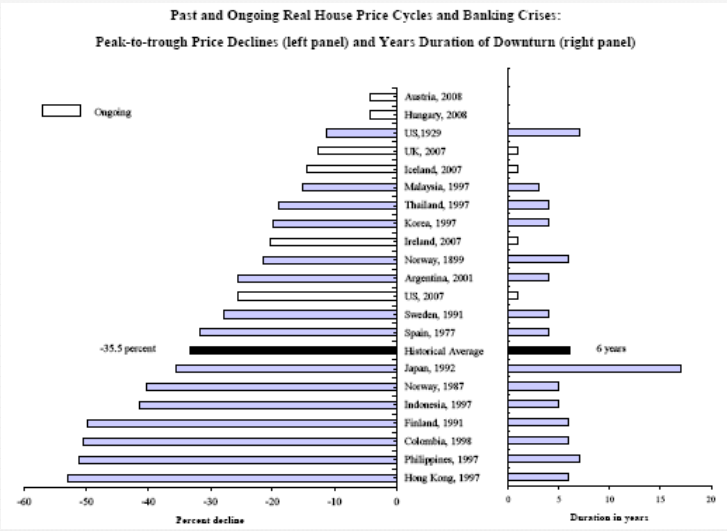


- Some of the previous financial crisis, as well as the subprime crisis, were even triggered by simultaneous bubbles in the real estate and in the equity markets.

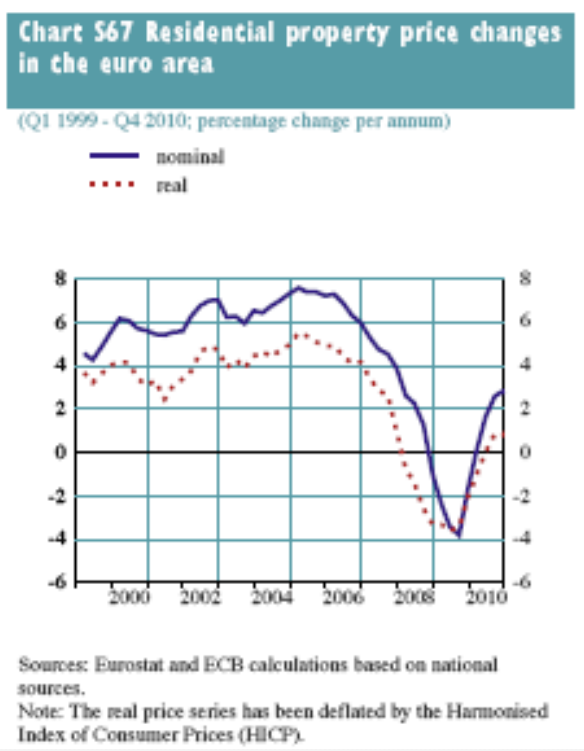
Source: IMF (2009), "World Economic Outlook", October.

Real Estate

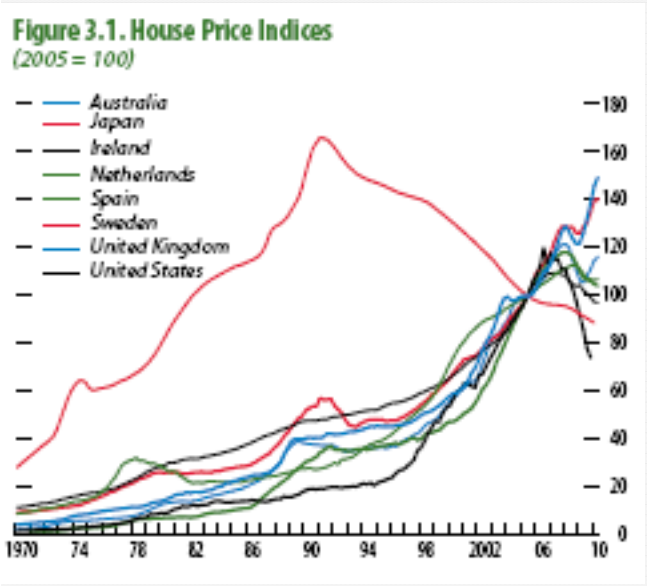
- On average, after financial crisis real estate prices fell by roughly 35%, for a period of 6 years.



Source: Reinhart, Carmen M. and Kenneth S. Rogoff (2009), "The Aftermath of Financial Crises", American Economic Review, Vol. 99, No.2, May.



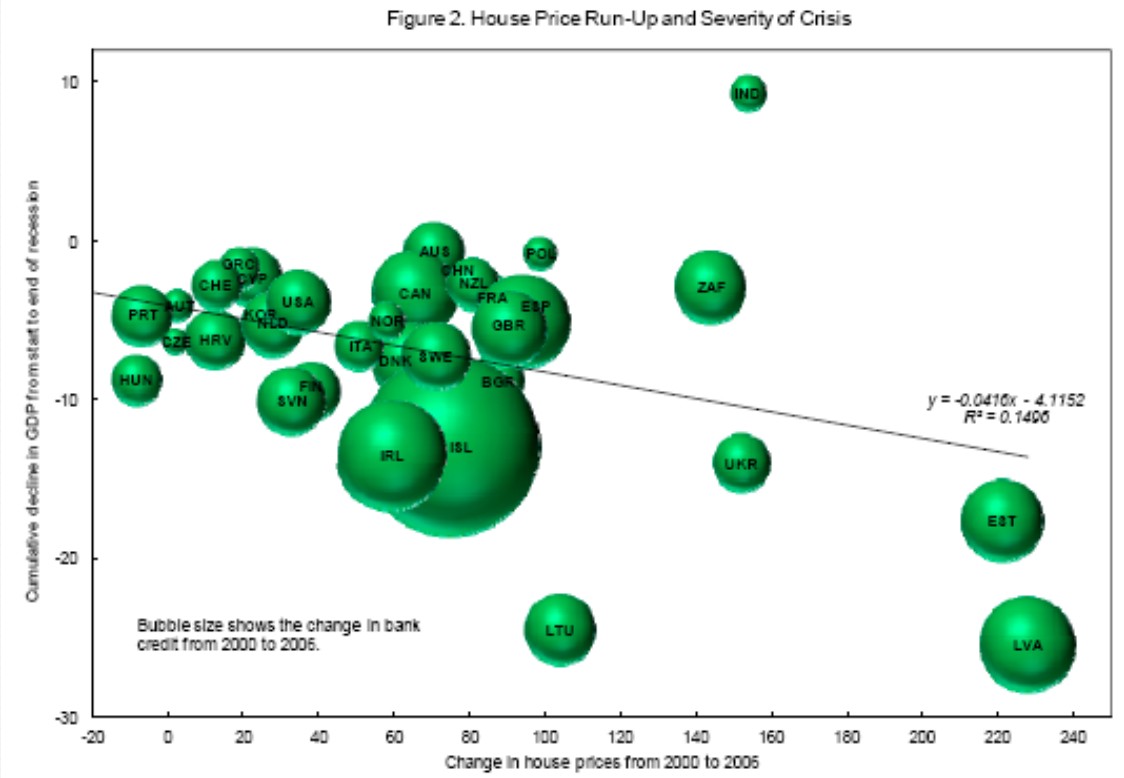
Source: European Central Bank (2011), "Financial Stability Review", June.



Source: IMF (2011), "Global Financial Stability Report", Abril.

Real Estate

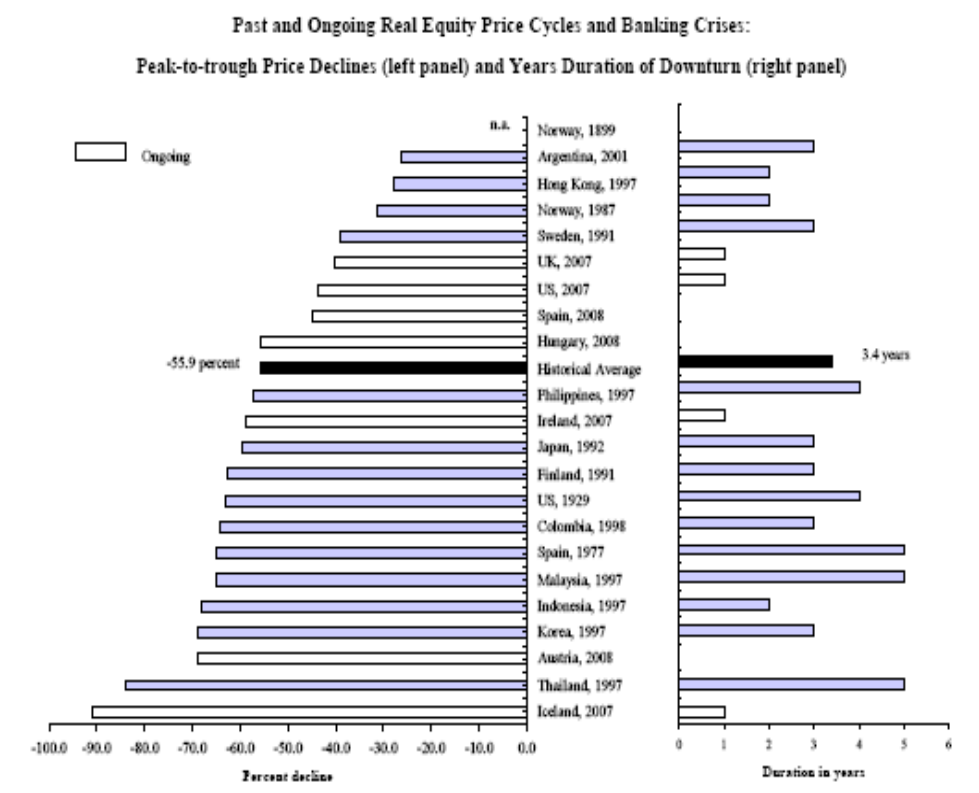
- Given that this crisis resulted from a twin boom – excessive growth of credit and real estate prices, the impact of the crisis was significantly high.
- According to Haldane (2010), the NPV of the cost of the crisis was between 1 and 5 times the annual world GDP.



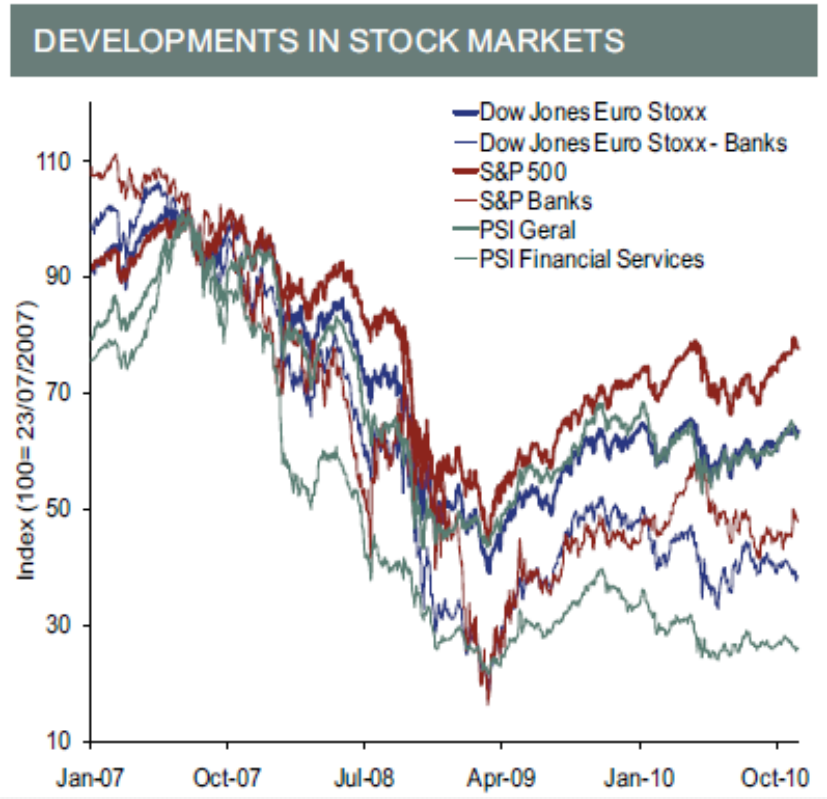
Source: Crowe, Christopher, Giovanni Dell'Ariccia, Deniz Igan, and Pau Rabanal (2011), "How to Deal with Real Estate Booms: Lessons from Country Experiences", IMF WP 11/91, April.

Stock Markets

- Equity prices fell by around 56% on average, during 3,4 years.



Source: Reinhart, Carmen M. and Kenneth S. Rogoff (2009), "The Aftermath of Financial Crises", American Economic Review, Vol. 99, No.2, May.

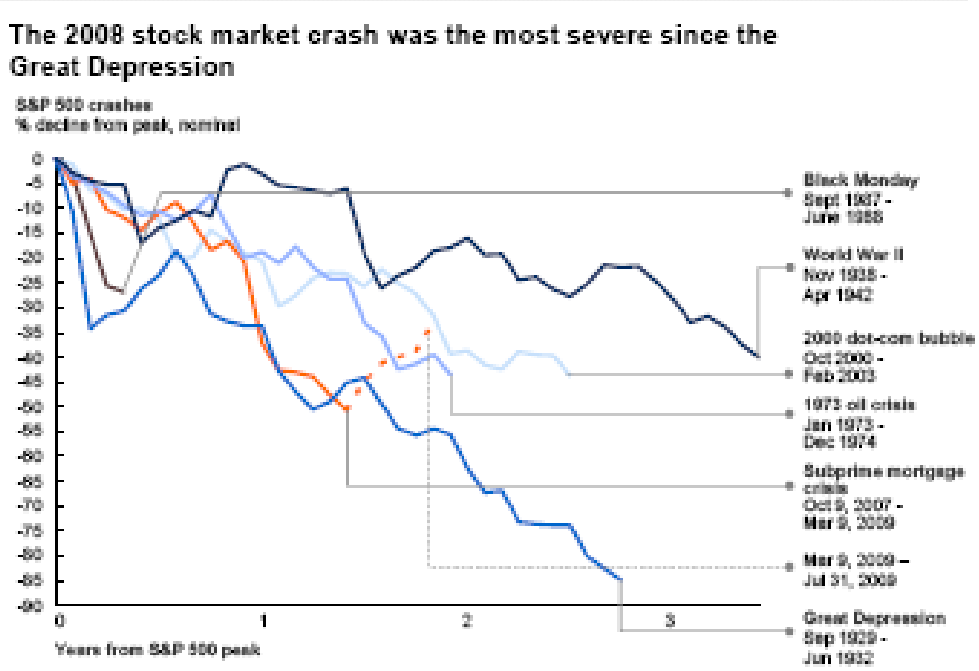


Source: Banco de Portugal (2010), "Financial Stability Report", Nov..

Stock Markets

- In its initial year, the impact of the subprime crisis on US stock prices was similar to the one in the Great Depression, but its peak-to-through variation reached only -56%, in line with the historical average and substantially less severe than in 1929 (-85%).

Source: Reuters



Source: McKinsey (2009), "Global capital markets: Entering a new era"

1.3.3. Origins

Governance Problems

- Senior Supervisors Group (2009), "Risk Management Lessons from the Global Banking Crisis of 2008", October 21:

- "weaknesses in governance, incentives, and infrastructure undermined the effectiveness of risk controls and contributed to last year's systemic vulnerability, (…) reflecting four challenges in governance:

(i) Lack of risk limits – unwillingness/inability of boards and senior managers to articulate, measure, and adhere to a level of risk acceptable to the firm;

(ii) Low status and influence of risk management and control functions vis-à-via revenue producers - arrangements that favored risk takers at the expense of independent risk managers and control personnel, e.g. remuneration;

(iii) Perverse incentives from compensation plans - insensitivity of remuneration to risk, with skewed incentives to maximize revenues and conflicting with the control objectives;

(iv) Inadequate/fragmented infrastructure - hindered effective risk identification and measurement".

Inadequate Supervision and Regulatory Framework

- The building-up of risks was not being understood by market participants, major international entities and regulators.
- On contrary, financial market developments were perceived as financial innovation and helpful for the resilience of the financial system, being instrumental to preserve the Great Moderation, a period of stable growth and inflation.
- "In April 2006, only 15 months before the onset of the financial crisis, the IMF's GFSR noted with approval the "growing recognition that the dispersal of credit risk by banks to a broader and more diverse group of investors … has helped make the banking and overall financial system more resilient". **"Consequently, the commercial banks may be less vulnerable today to credit or economic shocks".**
- Rajan and Zingales (2004): "In the last 30 years, dramatic changes in financial systems around the world amounting, de facto, to a revolution have brought many … advances … We have come closer to the utopia of finance for all".

in Turner, Adair (2015), Between Debt and the Devil: Money, Credit, and Fixing Global Finance, October, Princeton University Press.

Inadequate Supervision and Regulatory Framework

- Irrelevance of the financial system in macroeconomic models and central banking.
- In central banks, financial system developments were seen as neutral.

- Economists from the 1920s and 1930s, e.g. Friedrich Hayek, Irving Fisher or John M. Keynes considered that the banking system had vital implications for macroeconomic stability, but these views were increasingly rejected since the 70s.

- Mervin King (2012) on the theoretical foundations of modern monetary economics: "lacks an account of financial intermediation, so money, credit and banking play no meaningful role" (from Turner (2015)).

Inadequate Supervision and Regulatory Framework

- Reasons for this benign view:

(i) Economic history suggests that early stages of economic development required modern financial systems:

- the growth of financial markets enabled canal and railway investments in the XIX century, as well as the German and the British industrialization.

(ii) Empirical evidence:

- According to Levine (2005), "financial deepening" is beneficial, with positive correlations between private sector credit and stock market turnover, on one hand, and economic growth, on the other hand (in Turner (2015)): "better developed financial systems ease external financing constraints facing firms, which illuminates one mechanism through which financial development influences economic growth".

Inadequate Supervision and Regulatory Framework

- Therefore, increasing leverage was not relevant.

(i) Central banks were focused on controlling inflation, which was ensured – The Great Moderation, with low and stable inflation + macroeconomic stability.

(ii) Financial system issues were left to financial regulators and supervisors.

- 2 errors behind the failure in identifying timely the subprime crisis:

(i) Financial markets are different from other markets and the case behind market liberalization is weaker;

(ii) Failure to recognize the key macroeconomic consequences of excessive credit growth.

Inadequate Supervision and Regulatory Framework

- According to the Squam Lake Report, the subprime crisis revealed 4 categories of serious problems in the financial system:

(i) conflicts of interest, i.e. agency problems;

(ii) difficulty of applying standard bankruptcy procedures to financial institutions;

(iii) emergence of a modern form of bank runs; and

(iv) inadequacy of the regulatory structure, not kept up with recent financial innovation (in fact, much innovation served to escape regulations).

Inadequate Supervision and Regulatory Framework

(i) conflicts of interest:

- asymmetric returns of traders and managers;
- shareholders have an incentive to authorize excessively risky investments - the gains from risky investments will accrue largely to shareholders, while the losses will mostly be borne by creditors;
- agency problems between shareholders (outsiders) and managers (insiders);
- conflict of interest between society as a whole and the private owners of FIs => governments often rescue troubled FIs perceived to be systemically important (too big to fail) => privatized gains and socialized losses.

Inadequate Supervision and Regulatory Framework

(ii) difficulty of applying standard bankruptcy procedures to FIs – costs of disorderly liquidation of FI:

- valuable knowledge that the institution has accumulated about its counterparties (borrowers, trading partners, …) can disappear as the institution loses employees and ceases to operate normally;
- prospect of a disorderly liquidation => creditors claim their money today, to avoid protracted liquidation proceedings => higher probability of bank runs;
- "fire sales" of specialized assets => depress prices and spread problems to other holders of the asset class;
- increases the uncertainty about the impact of a FI's failure on its counterparties and other claimholders => as financial firms are tightly interconnected, this uncertainty can precipitate or intensify a financial crisis.

Inadequate Supervision and Regulatory Framework

(ii) difficulty of applying standard bankruptcy procedures to financial institutions – costs of disorderly liquidation of FI:

- Chapter 11 in US:
  - allows both for liquidation of a firm and the sale of its assets and for continued operation of a firm under the supervision of a bankruptcy judge who protects the firm from creditors' claims while a reorganization plan is approved.
  - these procedures appear to work well for nonfinancial corporations, but not so well for FI, as the approach of separating a firm's financial affairs from its nonfinancial business activities is infeasible when the business of the firm is financial transactions.
  - many FI rely heavily on short-term debt => FI vulnerable to a rapid withdrawal of short-term credit before any event triggering bankruptcy.

Inadequate Supervision and Regulatory Framework

(iii) emergence of a modern form of bank runs:

- banks typically finance a significant fraction of their business with short-term debt, that is rolled over in normal times when it matures, but not under a crisis => run similar to a classic run on deposits.

(iv) inadequacy of the regulatory structure

- financial regulations are typically designed to ensure the health of individual FIs, rather than the financial system as a whole.

Inadequate Supervision and Regulatory Framework

- "The Great Moderation ended in the crisis of 2007-2008 and in a severe post-crisis "Great Recession",

  in Turner, Adair (2015), Between Debt and the Devil: Money, Credit, and Fixing Global Finance, October, Princeton University Press.

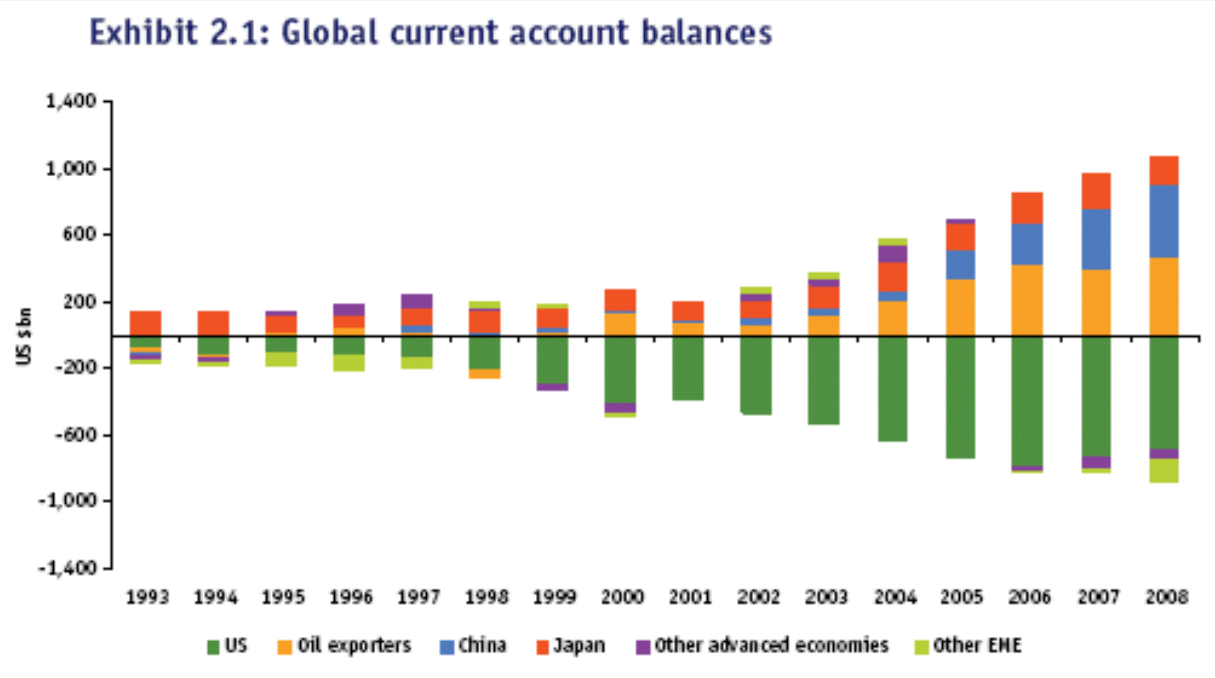
- During the Great Moderation, investors accepted lower expected returns, due to:

(i) higher savings in emerging markets, driven by a combination of demographics and rapid economic growth, boosted by current account surpluses and predominantly invested in developed markets, following the desire to accumulate foreign reserves in the aftermath of the Asian crisis of 1997–98;

(ii) low risk premium, resulting from low volatility between 2003 and 2006.

Macroeconomic Issues

- Accommodative monetary policy => low interest rates fed the credit growth.
- The history of postwar had seen only 2 episodes of real fed funds rate remaining negative for several consecutive years: the high-inflation episode of 1975-1978 and in 2002-2005.
- The crisis was preceded by the accumulation of severe macroeconomic disequilibria at an international level:



Source: Financial Services Authority (2009), "A regulatory response to the global banking crisis", DP 09/2 (Turner Report).

Macroeconomic Issues

- Worldwide savings channeled increasingly to US, due to its growing indebtedness, both in the Government sector and in households.

Exhibit 2.2: Foreign-ownership of marketable US Treasury bonds as percentage of total amounts outstanding

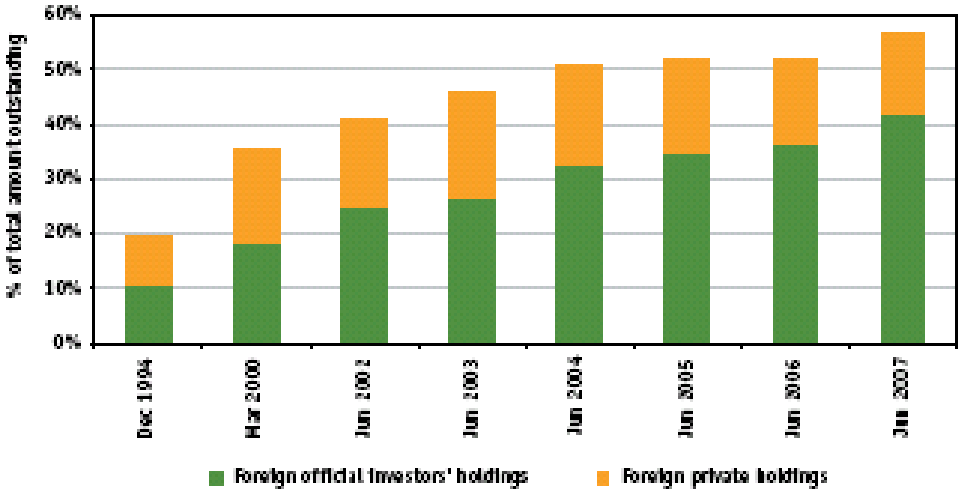
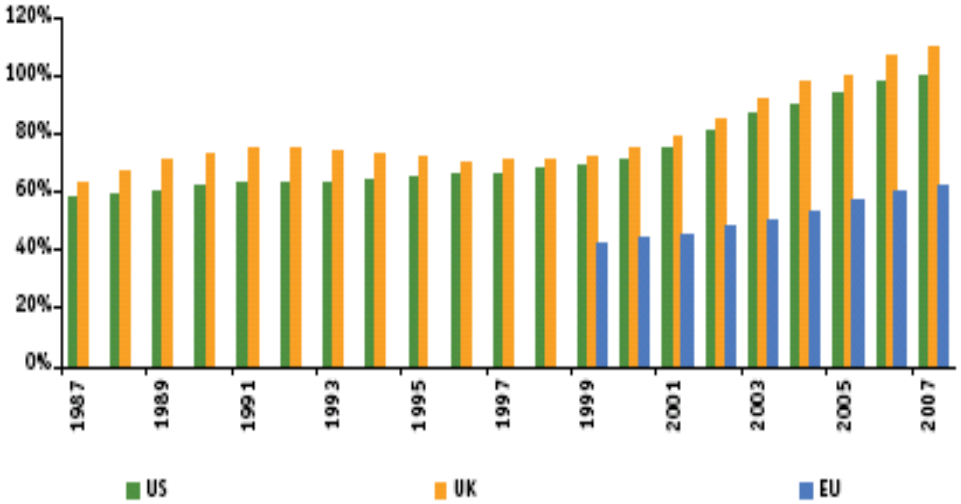


Exhibit 2.4: Household debt as proportion of the GDP

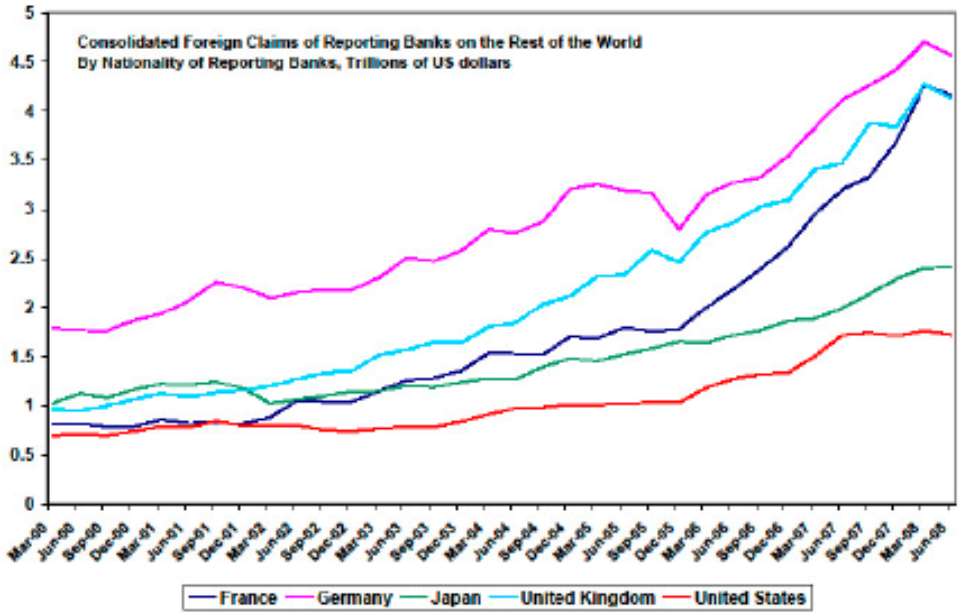


Source: Financial Services Authority (2009), "A regulatory response to the global banking crisis", DP 09/2 (Turner Report)

Contagion

- The contagion among countries occurred through FIs, given the increasing international connectedness…

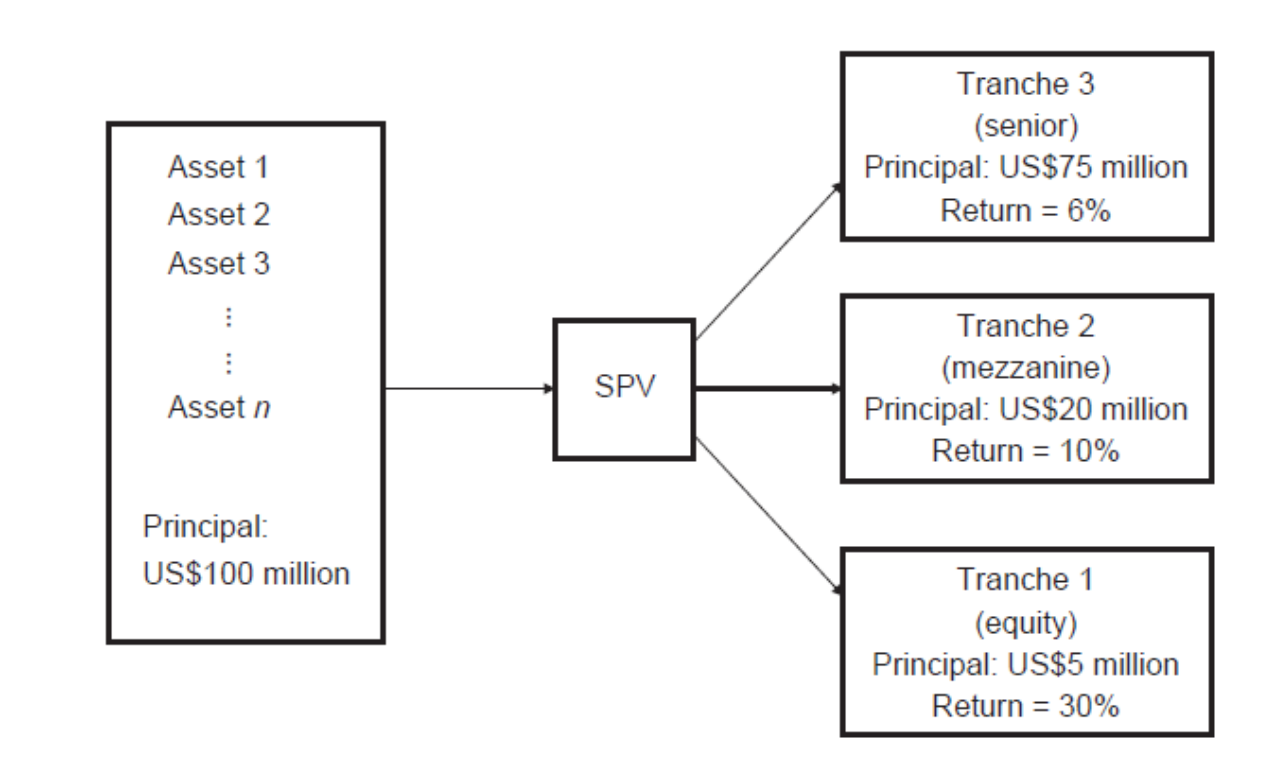
Figure 3. Connectedness Across Countries: Advanced Economies Banks' Claims on the Rest of the World



Source: Blanchard, Olivier (2009), "The Crisis: Basic Mechanisms and Appropriate Policies", WP/09/80.

Contagion

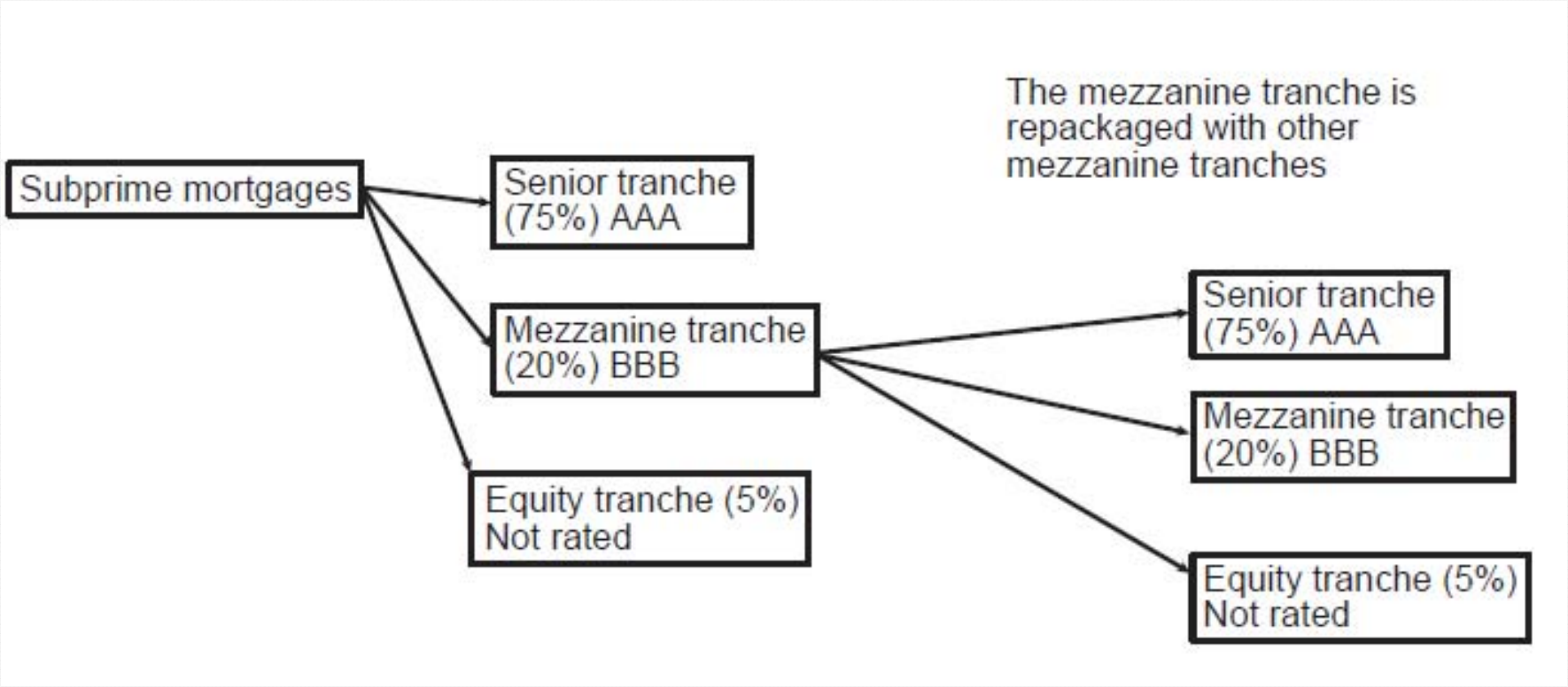
- …, namely through the securitization of mortgage loans, being the securities issued by the SPVs purchased by international investors:



Source: Hull (2009), "The Credit Crunch of 2007: What Went Wrong? Why? What Lessons Can Be Learned?", The Journal of Credit Risk, Volume 5/Number 2, Summer.

Contagion

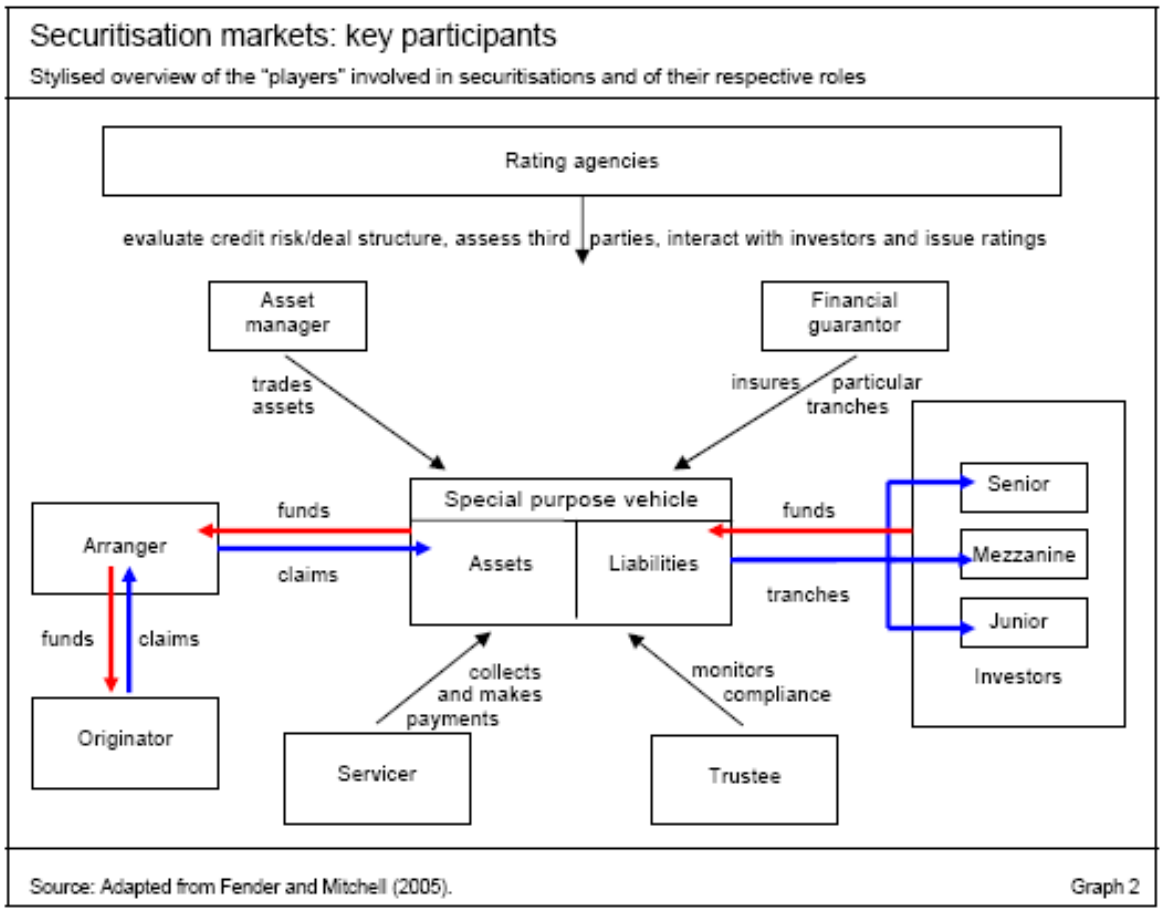
- Afterwards these ABS could originate other structures, e.g. ABS CDO…



Source: Hull (2009), "The Credit Crunch of 2007: What Went Wrong? Why? What Lessons Can Be Learned?", The Journal of Credit Risk, Volume 5/Number 2, Summer.

Contagion

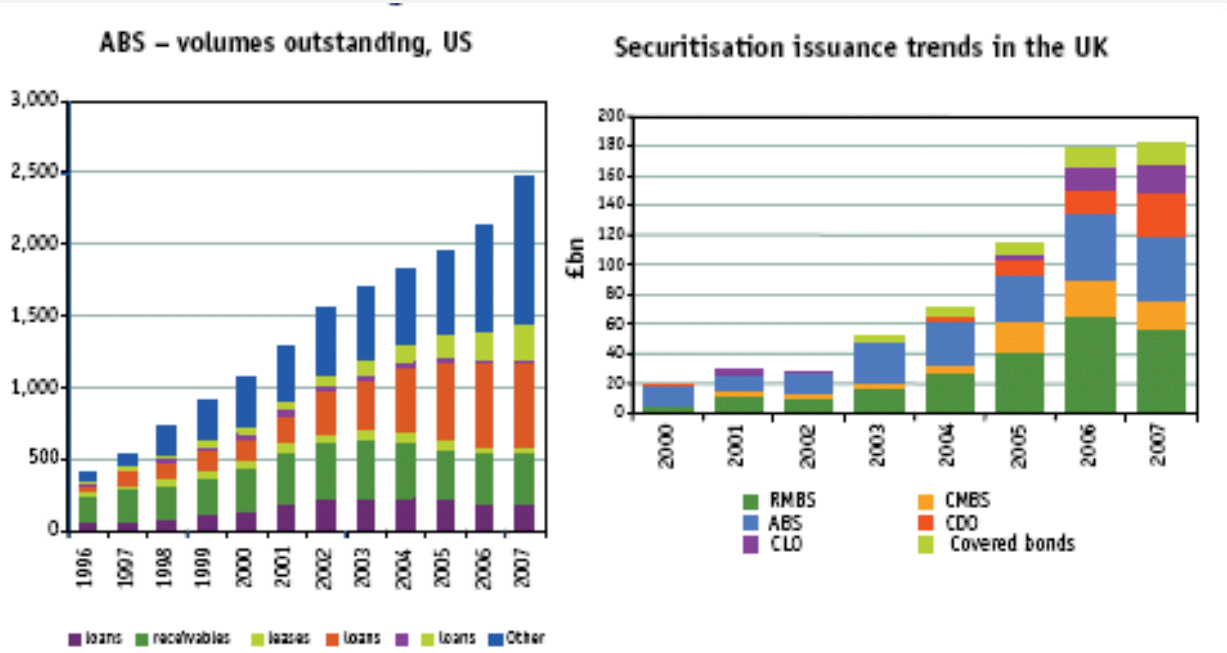
- …, with a complex set of institutions involved.



Source: BIS (2010), "BIS Quarterly Review – Sep".

Contagion

- Securitizations increased by 5 times in 10 years, until 2007.



Source: Financial Services Authority (2009), "A regulatory response to the global banking crisis", DP 09/2 (Turner Report).

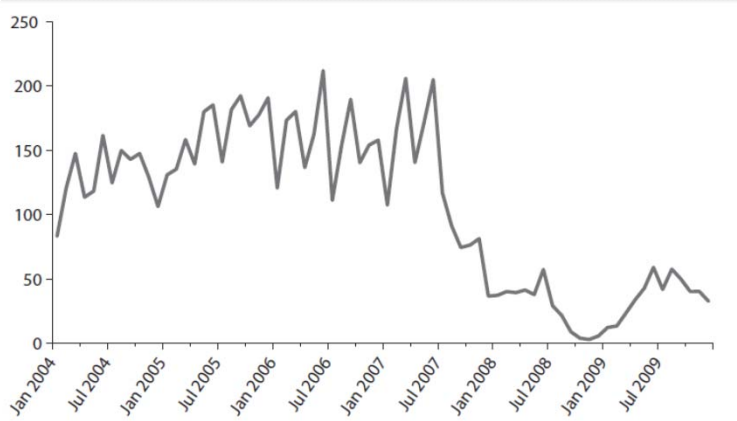
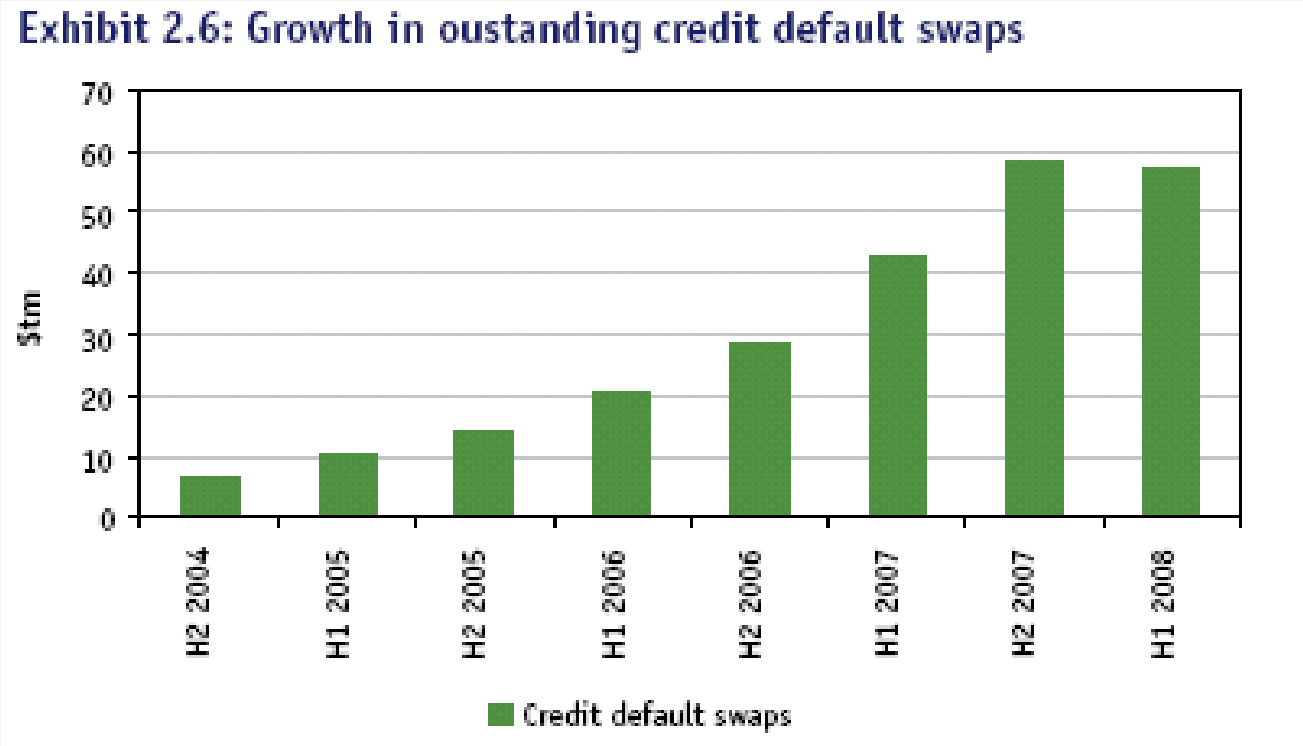


Figure 2: Asset Backed Securities Issued in the United States, January 2004 to December 2009, Billions of Dollars per Month. Source: Federal Reserve

Source: French et al (2010), "The Squam Lake Report: Fixing the Financial System, Princeton University Press

Contagion

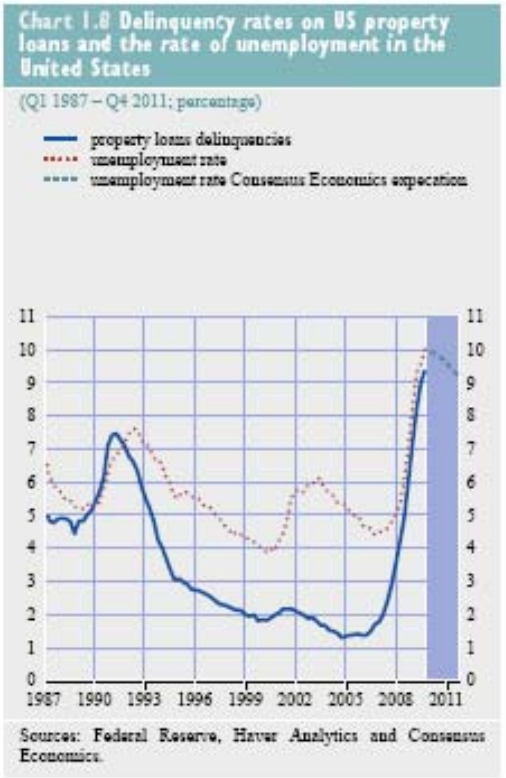
- CDS also increased significantly the contagion effect at an international level.



Source: Financial Services Authority (2009), "A regulatory response to the global banking crisis", DP 09/2 (Turner Report)

Real Estate Market

- The crisis was triggered by the bubble in the US real estate market, ...



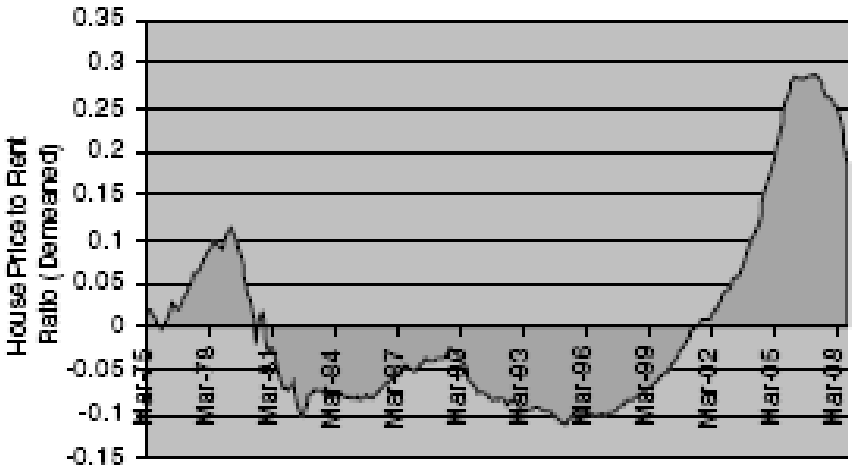


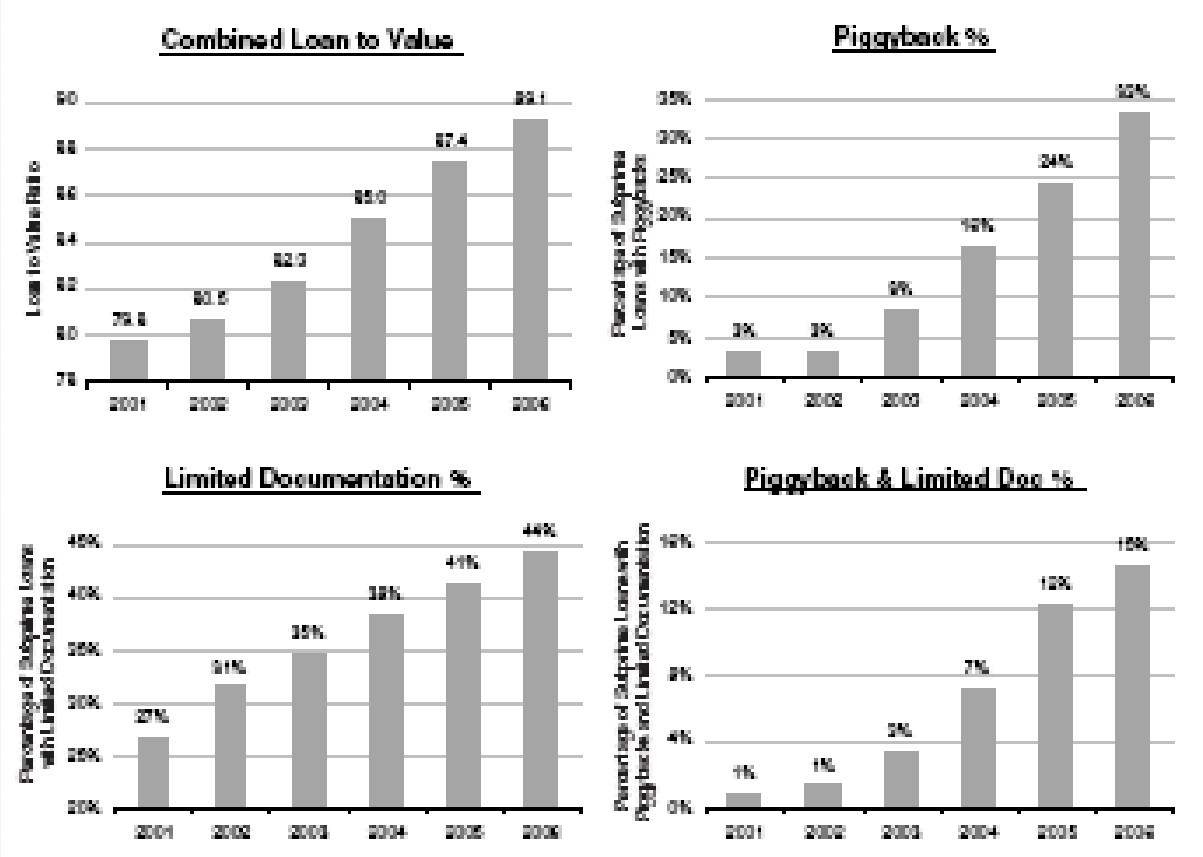
Figure 3: House Price to Rent Ratio (1975-2008).

Source: Acharya, Viral, Thomas Philippon, Matthew Richardson and Nouriel Roubini (2009), "The Financial Crisis of 2007-2009: Causes and Remedies", in Financial Markets, Institutions & Instruments, New York University Salomon Center and Wiley Periodicals, Volume 18, Issue 2, May.

Source: European Central Bank (2010), "Financial Stability Review 2009".

Real Estate Market

- … following the adoption of more permissive loan criteria, …

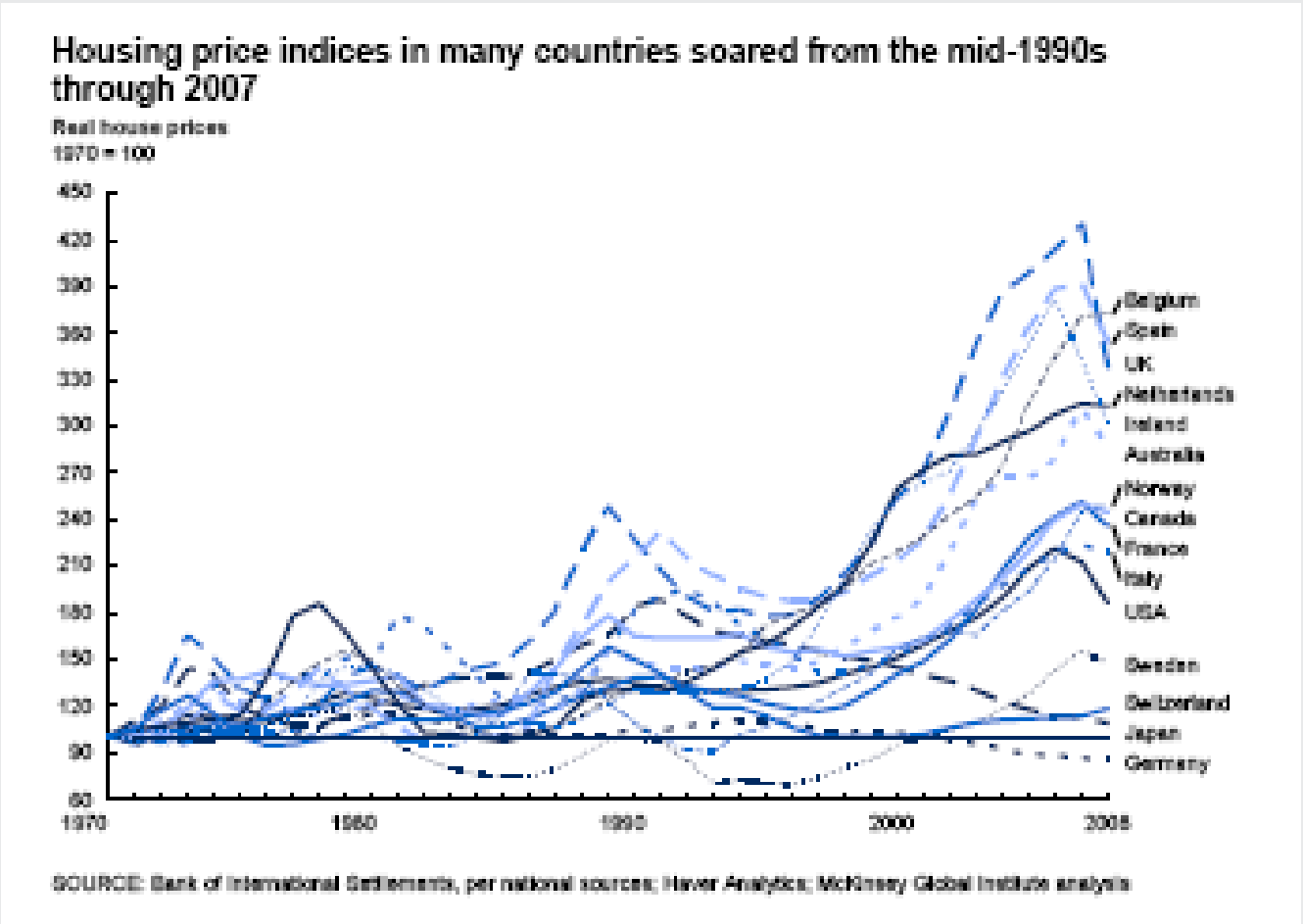


Source: Acharya, Viral, Thomas Philippon, Matthew Richardson and Nouriel Roubini (2009), "The Financial Crisis of 2007-2009: Causes and Remedies", in Financial Markets, Institutions & Instruments, New York University Salomon Center and Wiley Periodicals, Volume 18, Issue 2, May.

Note: piggyback loans correspond to the additional loans granted with the residential mortgage.

Real Estate Market

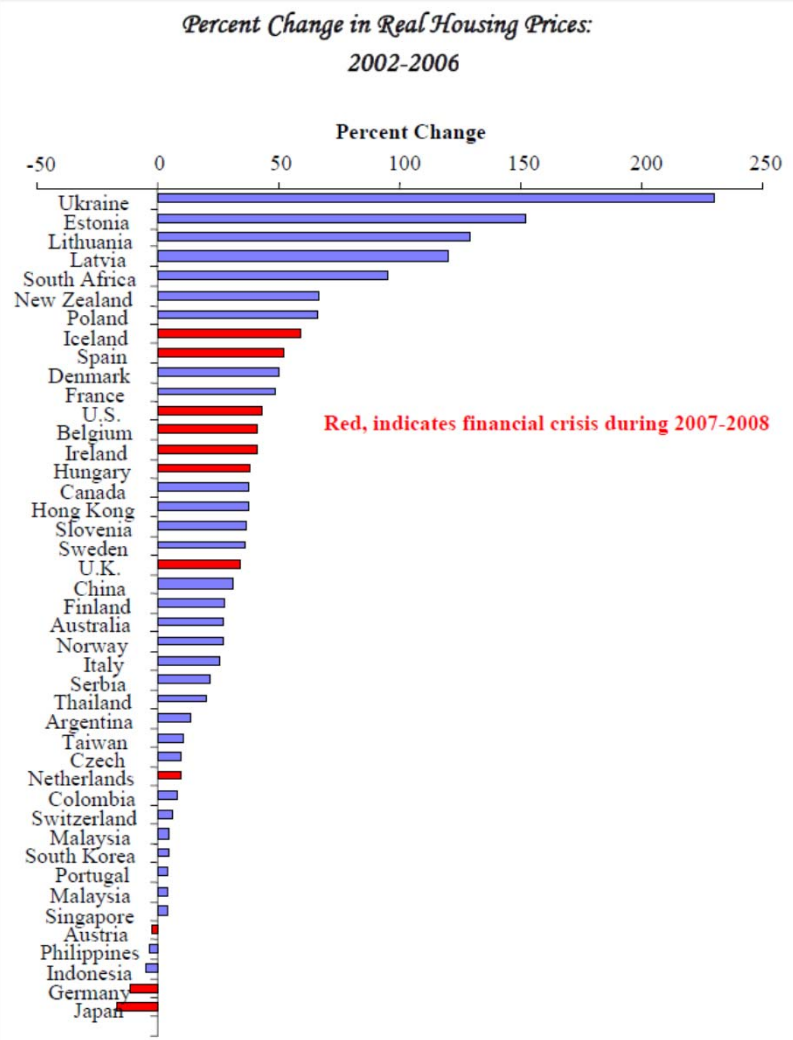
…, impacting later on the European market:



Source: McKinsey (2009), "Global capital markets: Entering a new era".

Real Estate Market

- Significant price increases in the real estate market were observed in many countries but financial crisis didn't afflict all of them.



Source: Reinhart, Carmen M. and Vincent R. Reinhart (2010), "After the fall", FRBKC Jackson Hole Symposium Proceedings, August.

1.3.4. Policy Reactions

Policy Reactions

- Subprime crisis triggered the intervention of prudential authorities, central banks and Governments:

(i) takeovers/bailouts

- UK - takeover of Northern Rock in 2007 (after the 1st bank run in UK in 150 years).
- US
  - In 2008, Bear Sterns and WaMu were bought by JP Morgan, while Wachovia was bought by Wells Fargo, after the involvement of the Fed, and Treasury supported AIG.
  - TARP (Troubled Asset Relief Program) - and launched, to purchase up to 700B$ of illiquid mortgage related securities from FIs.
  - Afterwards, TARP was orientated to inject capital directly into the banks and to provide financial support to several economic sectors, namely carmakers.
  - TALF (Term Asset-Backed Securities Lending Facility) – launched at the end of 2008, to restart the flow of funds in the consumer credit market.

Policy Reactions

- The financial aid programs to support FIs broadly followed 5 stages:

(i) Sep.08 – Isolated actions to support large FIs (e.g. AIG, Fortis, Dexia)

(ii) Oct.08 – Comprehensive support packages implemented (e.g. US, UK, Italy, Netherlands, Canada, Australia)

(iii) Nov.-Dec.08 – Additional isolated actions (e.g. Citigroup)

(iv) Jan.-Abr.09 – New support packages (e.g. UK, US, Japan)

(v) May-Jun.09–Start of program' closing in US.

Date of announcement	Country/ institution	Type of action[1]	Type of measure[2]	Currency	Amount (billions)[3]	DESCRIPTION
16 Sep 2008	AIG	SAA	CI	USD	85	Emergency credit line to AIG from the NY Fed, in exchange for which the US Treasury gets a 79.9% equity interest.
29 Sep 2008	Fortis	SAA	CI	EUR	4	The Dutch government purchases 49% of the Dutch activity of Fortis Group (jointly with Belgium and Luxembourg).
30 Sep 2008	Dexia	SAA	CI	EUR	3	The French government recapitalises Dexia, replacing top management positions (jointly with Belgium and Luxembourg).
03 Oct 2008	Fortis	SAA	CI	EUR	13	The Dutch government completes the nationalisation of the Dutch arm of Fortis Group.
	US	PRO	AP	USD	700	Emergency Economic Stabilization Act, containing a commitment for up to $700 billion to purchase bad assets from banks (TARP).
06 Oct 2008	Hypo Real Estate	SAA	DG	EUR	50	First round of help for HRE.
08 Oct 2008	IT	PRO	CI	EUR	Unspecified	Italy approves a law granting the government the possibility to recapitalise distressed banks.
	GB	PRO	CI	GBP	50	The United Kingdom adopts a comprehensive rescue plan, including CI and DG measures.
		PRO	DG	GBP	250	
09 Oct 2008	NL	PRO	CI	EUR	20	The government announces that public funds can be used for bank recapitalisation, of which €20 billion immediately available.
10 Oct 2008	CA	PRO	DG	CAD	Unspecified	The government announces a scheme to guarantee bank liabilities.
12 Oct 2008	AU	PRO	DG	AUD	Unspecified	The government announces a scheme to guarantee bank liabilities.
13 Oct 2008	FR	PRO	CI	EUR	40	Over the weekend, euro area countries agree on a concerted action plan to preserve banking stability; as a follow-up national governments approve schemes including CI, DG and AP.
		PRO	DG	EUR	265	
	DE	PRO	DG	EUR	400	
		PRO	CI&AP	EUR	80	
	IT	PRO	DG	EUR	Unspecified	
	ES	PRO	DG	EUR	100	
		PRO	CI	EUR	Unspecified	
	US	PRO	CI	USD	250	The government announces that up to $250 billion of TARP funds, originally earmarked to buy bad assets, will instead be used to recapitalise banks (Capital Purchase Program).
14 Oct 2008	NL	PRO	DG	EUR	200	Debt guarantee scheme approved.
	US	PRO	DG	USD	2,250	Debt guarantee scheme approved.
16 Oct 2008	UBS	SAA	AP	USD	54	The Swiss government recapitalises UBS and the SNB sets up a vehicle to remove up to $60 billion worth of illiquid assets from UBS's balance sheet, on which the bank will bear the first $6 billion loss.
			CI	CHF	6	
05 Nov 2008	CH	PRO	DG	CHF	Unspecified	The government announces that it will - if needed - provide a guarantee on bank liabilities.

Source: BIS (2009), "An assessment of financial sector rescue programmes", BIS Papers, No.48, July.

Policy Reactions

10 Nov 2008	AIG	SAA	AP CI	USD USD	47 15	Second round of help to AIG, including purchase of illiquid assets and capital injection via preferred shares (partly replacing the $85 billion credit line).
13 Nov 2008	Hypo Real Estate	SAA	DG	EUR	20	The government provides a guarantee on loans to HRE worth €20 billion (partly replacing the first round of measures).
23 Nov 2008	Citigroup	SAA	AG CI	USD USD	262 20	The Treasury subscribes $20 billion preferred shares and ring-fences troubled assets worth up to $306 billion (later reduced to $301 billion - on which Citigroup bears a first loss).
28 Nov 2008	IT	PRO	CI	EUR	Unspecified	The government approves a law to inject capital into sound banks.
17 Dec 2008	JP	PRO	CI	JPY	12000	A law is approved increasing the available funds for recapitalisation of banks from JPY 2 trillion to 12 trillion.
16 Jan 2009	Bank of America	SAA	AG CI	USD USD	97 20	The Treasury subscribes $20 billion of preferred shares and ring-fences troubled assets worth up to $118 billion (on which BoA bears a first loss).
19 Jan 2009	GB	PRO	AG	GBP	Unspecified	A new plan is announced by the government, including the possibility for financial institutions to ring-fence selected portfolios of illiquid assets through a government backstop insurance.
26 Jan 2009	ING	SAA	AG	EUR	28	The Dutch government provides a backup facility to cover the risks of the bank's securitised mortgage portfolio worth €35.1billion (of which ING bears a 20% loss).
03 Feb 2009	JP	PRO	AP	JPY	1000	Japan reintroduces a previously abandoned programme to purchase stocks from banks' balance sheets will resume.
10 Feb 2009	US	PRO	CI	USD	Unspecified	The Obama administration announces a new plan, including the Capital Assistance Program (stress tests and capital injections) and the Public-Private Investment Program (to remove legacy assets from banks' balance sheets; committed resources have been later quantified in $75-100 billion).
		PRO	AP	USD	Unspecified	
02 Mar 2009	AIG	SAA	CI	USD	30	Third round of help to AIG: the Treasury commits to a further $30 billion equity line, converts part of earlier preferred stock investments into instruments more closely resembling equity and restructures parts of AIG activities.
17 Mar 2009	JP	PRO	CI	JPY	1,000	The Bank of Japan announces a framework for providing subordinated loans to banks.
13 May 2009	DE	PRO	AG	EUR	200	Facility for banks to transfer toxic assets to a SPV, in exchange for government-guaranteed bonds.
09 Jun 2009	US	PRO	CI	USD	-68	The US Treasury allows 10 big banks to pay back funds received under the Capital Purchase Program.

[1] SAA = standalone action; PRO = programme. [2] CI = capital injection or emergency loan; DG = debt guarantee; AP = asset purchase; AG = asset guarantee. [3] Indicates the size of government exposure for the various interventions.

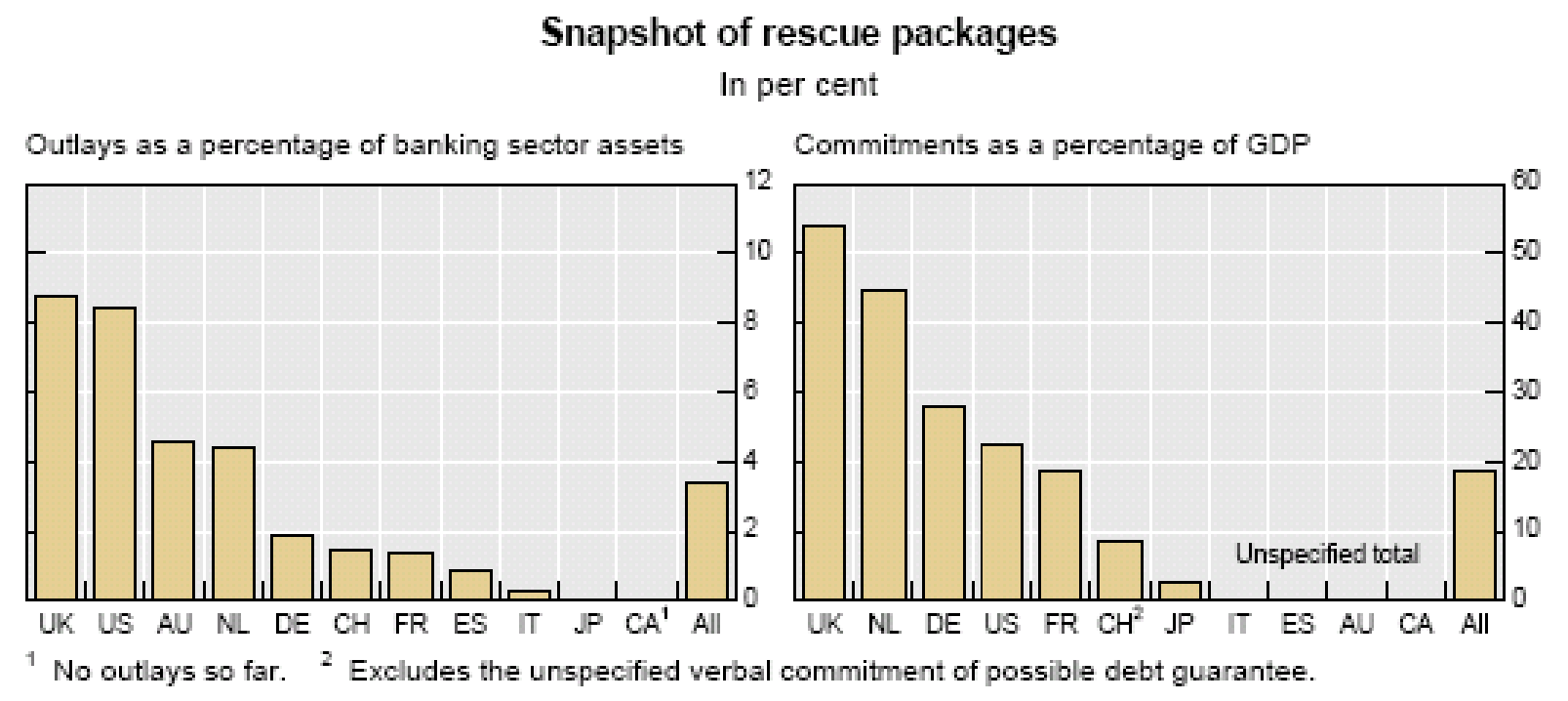
Source: BIS (2009), "An assessment of financial sector rescue programmes", BIS Papers, No.48, July.

Policy Reactions

- According to Alessandri and Haldane (2009), the Government support to the banks in the UK, US and the euro-area during the crisis may have reached over 14 T$ (almost a quarter of global GDP).
- This support dwarfs any previous state support of the banking system and were very diversified, including liquidity and capital injections, debt guarantees, deposit insurance and asset purchase.
- The subprime crisis, as the Great Depression of the 1930's, marked a shift in the state support to the banking system: in the Middle Ages, the biggest risk to banks were the sovereigns – now the biggest risk to sovereigns are banks: Causality has reversed.

Policy Reactions

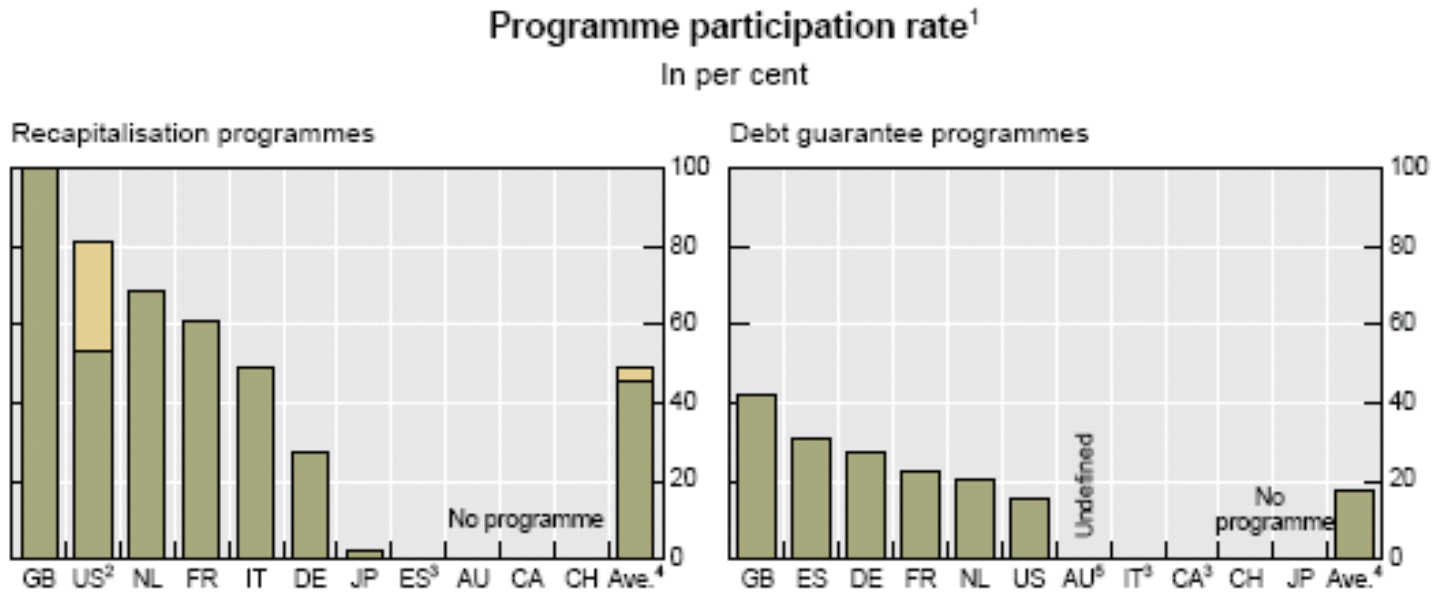
- As a percentage of the banking assets and GDP, Government interventions assumed a higher weight in UK, with commitments over 50% of the GDP …



Source: BIS (2009), "An assessment of financial sector rescue programmes", BIS Papers, No.48, July.

Policy Reactions

- The level of utilization of the Government commitments was also higher in UK, mostly concerning to the recapitalization programs (US in 2009 already at a repayment stage).



[1] Outlays under a programme as a percentage of the commitments of the programme. [2] The top part of the bar denotes the amount that has since been repaid to the government. [3] No participation so far. [4] Simple average of countries with programme and defined participation. The top part of the bar in the left-hand panel denotes the amount that has since been repaid by US banks to the government. [5] There is participation, but total commitment is not specified.

Source: BIS (2009), "An assessment of financial sector rescue programmes", BIS Papers, No.48, July.

Policy Reactions

- In Euro area countries, total commitments reached 24% of the GDP, mostly through liability guarantees.

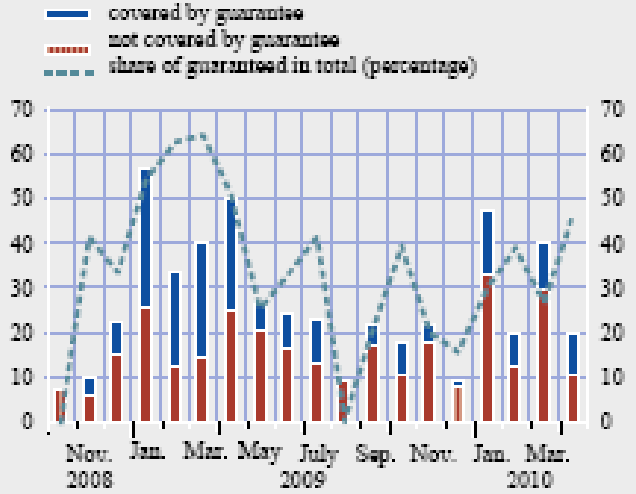
Summary of rescue measures in Europe

(EUR billions unless stated otherwise)

	Capital injections		Liability guarantees		Asset support		Total commitment
	Within schemes	Outside schemes	Guaranteed issuance of bonds	Other guarantees, loans	Within schemes	Outside schemes	as % GDP
Europe	103.4 (251)	56.6	543.7 (2,136)	236.8 (-)	585.4 (877)	26.2	27.3
EU	99.4 (247)	56.6	543.7 (2,096)	236.8 (-)	544.2 (836)	26.2	27.9
Euro area	59.1 (172)	54.1	396.8 (1,677)	235 (-)	23.7 (198)	26.2	23.7

Chart A Gross issuance of senior bank bonds in the euro area

(Oct. 2008 – Apr. 2010; EUR billions)

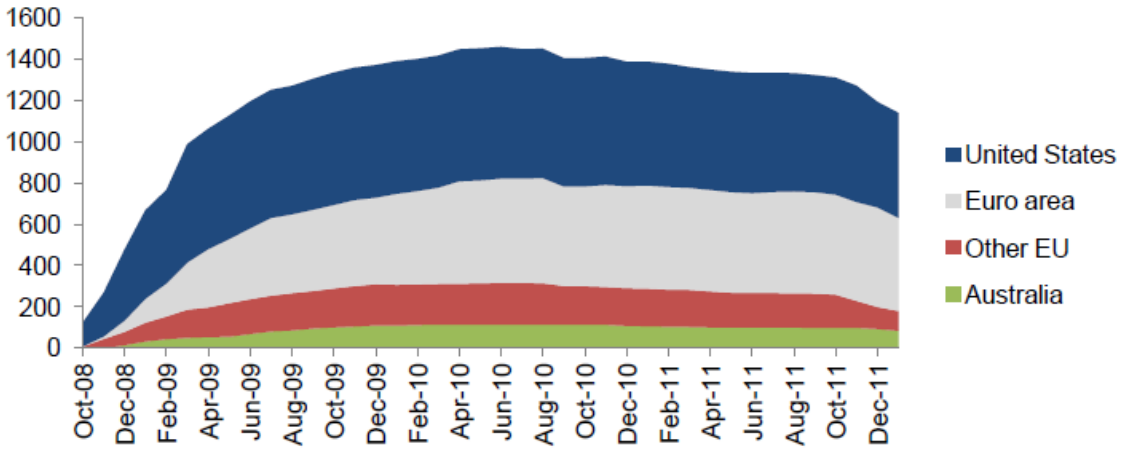


Source: European Central Bank (2009 and 2010), "Financial Stability Review 2008 and 2009".

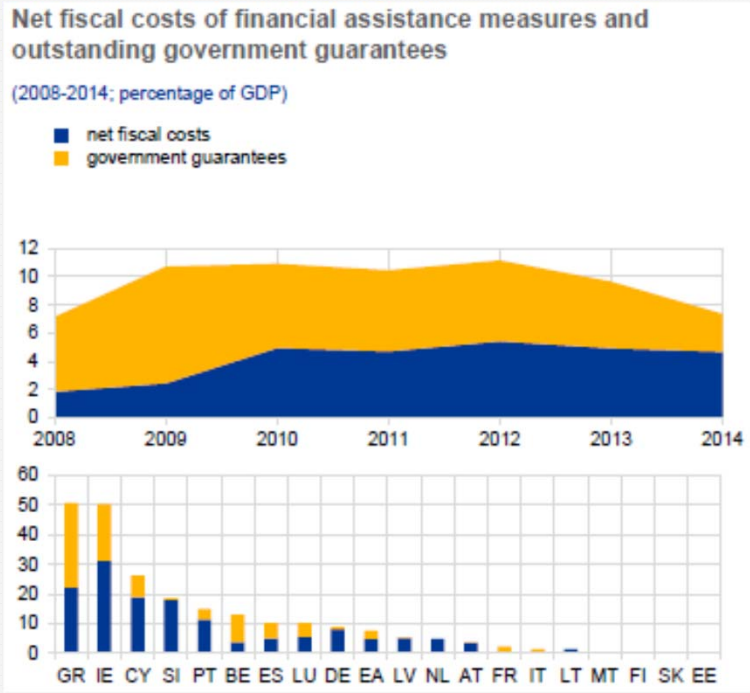
Policy Reactions

- The stock of outstanding government-guaranteed bonds still reached around 1.2T€ in early 2012, half of this figure from the US.
- Financial exposure of euro area governments arising from interventions in financial institutions is falling, but remains high in some euro area countries.

Figure 8. Outstanding Government-Guaranteed Bonds
(US$ billions)



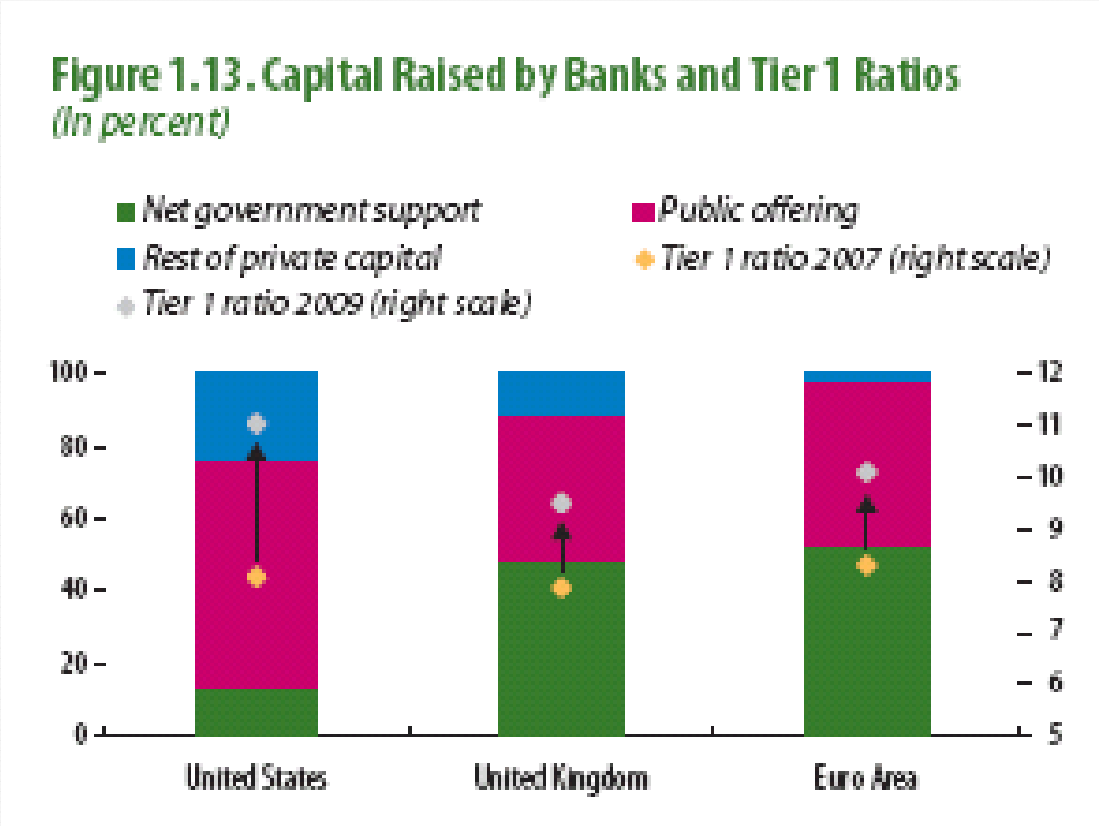
Source: IMF (2012), "Fiscal Transparency, Accountability and Risk".



Source: ECB (2016), "ECB Financial Stability Review", May.

Policy Reactions

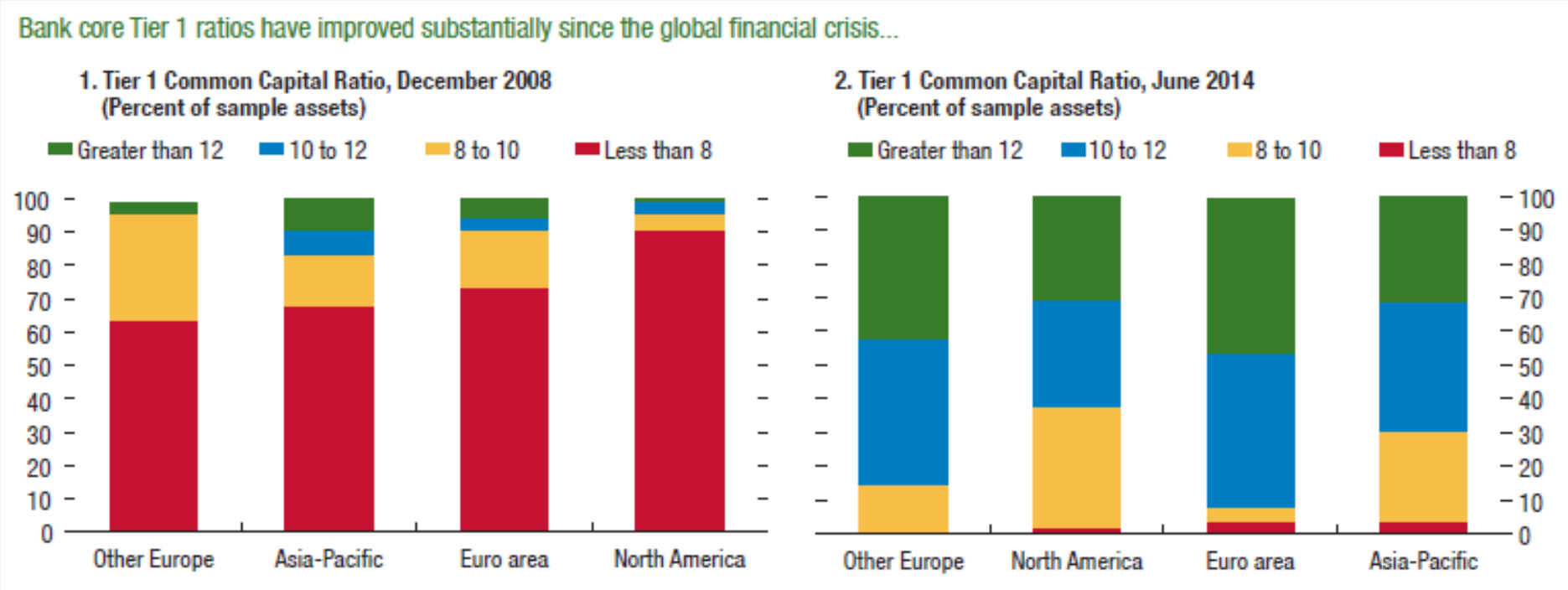
- Government interventions in banks' capital were essential to the strengthening of their own funds, namely in Europe, as in the US the ability to raise capital from the market was stronger.



Source: IMF (2010).

Policy Reactions

- This Government support was instrumental to the significant capital increases occurred in several jurisdictions.



Source: IMF (2014). "Global Financial Stability Review", October.

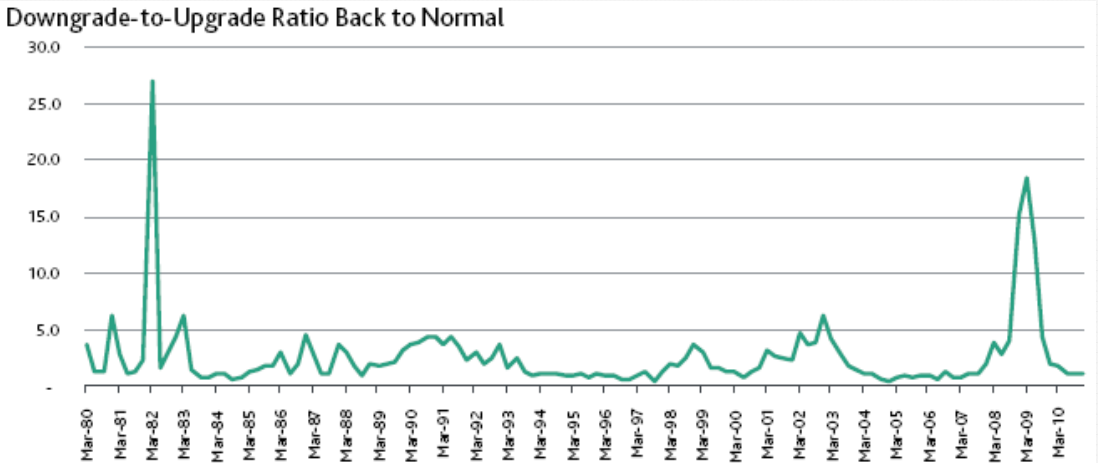
1.3.5. Aftermath

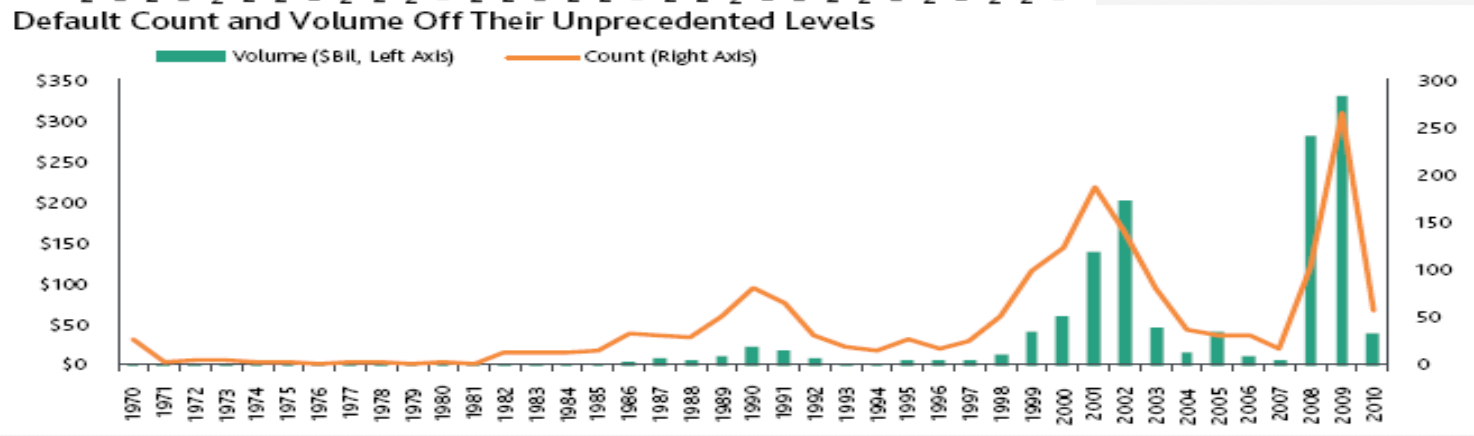
Aftermath

- Direct costs of Government support to the banking systems:
  - USA: negative (profits)
  - Remaining advanced economies – 3% of the GDP (maximum)
- Full economic cost of the crash and post-crisis recession in advanced economies:
  - Government debt/GDP: + 34% (2007-2014)
  - National incomes:
    - In 2009, according to Haldane (2010), world output in 2009 had been around 6.5% (10% in UK) lower than its counterfactual path in the absence of crisis.
    - Moreover, some of these GDP losses are expected to persist, according to past crises => net present value cost of the crisis between 1 and 5 times annual world GDP (Haldane (2010)).

Aftermath

- In 2010 some normalization of market conditions was already observed, with the decrease in the number of defaults and downgrades …

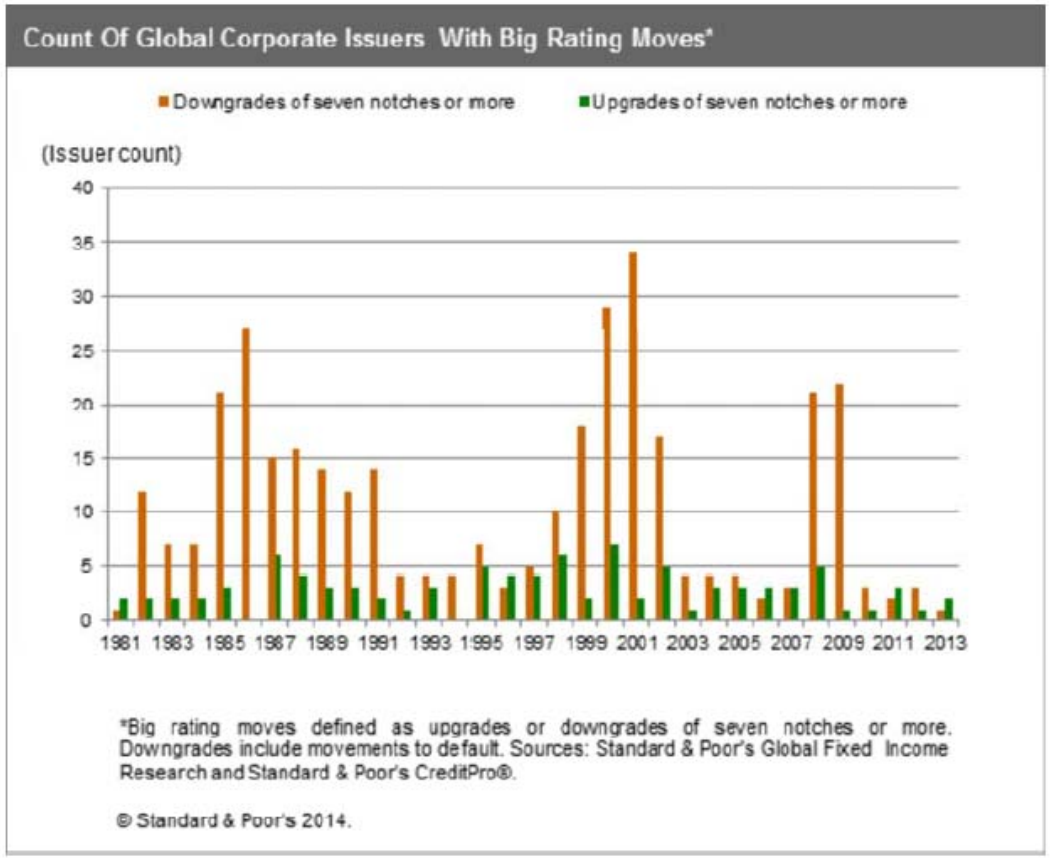




Source: Moody's (2011), "Corporate Default and Recovery Rates, 1920-2010".

Aftermath

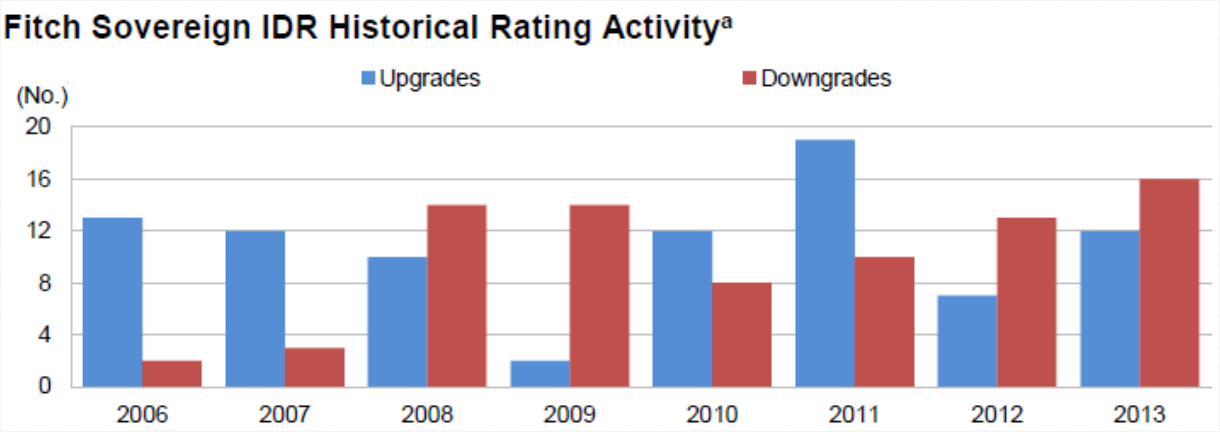
- … as well as in the number of extreme corporate rating changes …

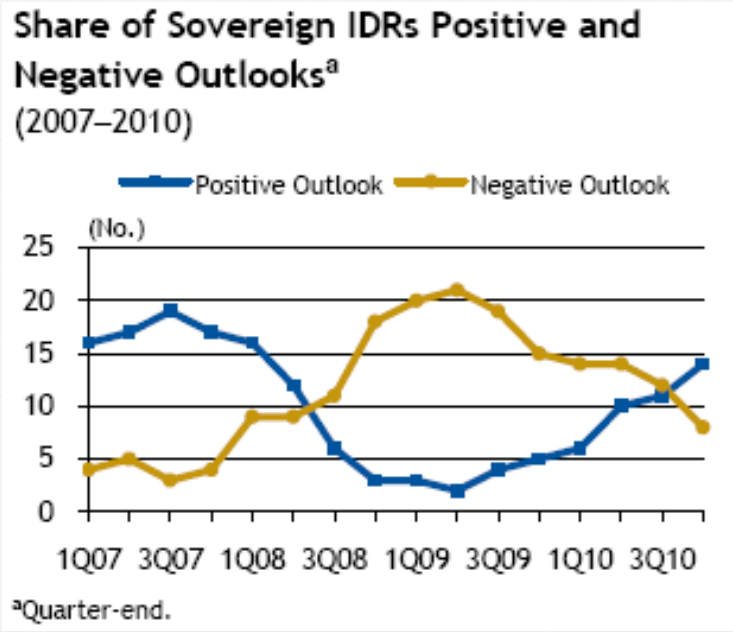


Source: S&P (2014), "Default, Transition and Recovery: 2013 Annual Global Corporate Default Study and Rating Transitions".

Aftermath

- … and in the sovereign market, where the upgrades and positive outlooks exceeded the downgrades and the negative outlooks, notwithstanding the sovereign debt crisis in the Euro area. …

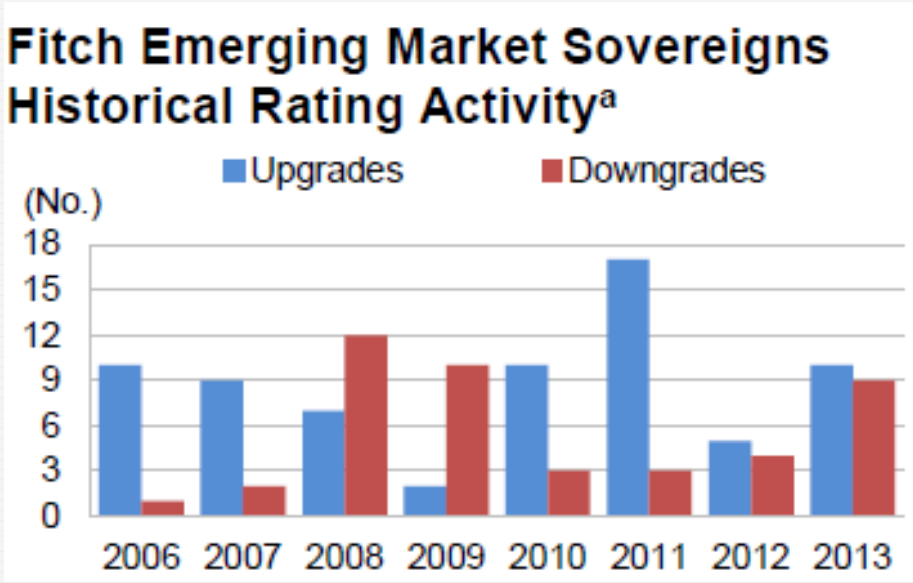


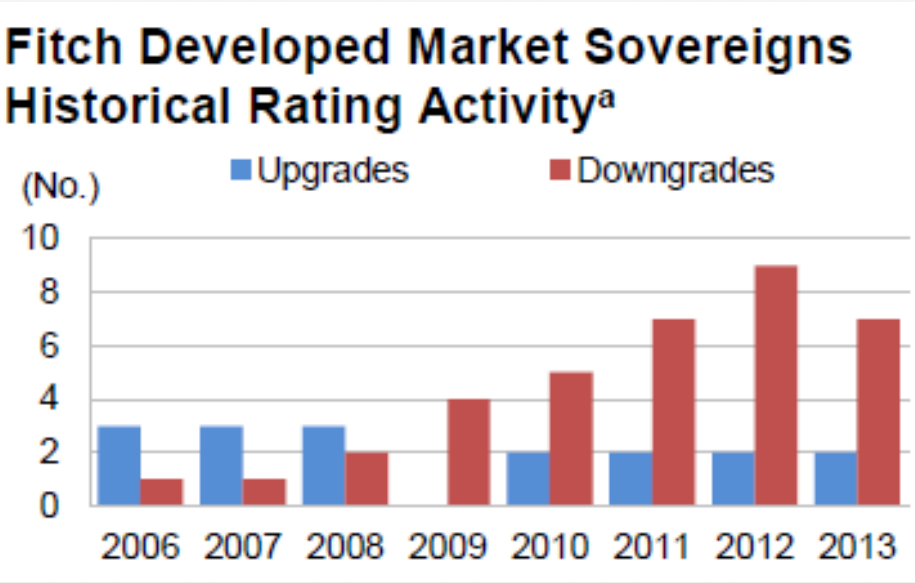


Source: Fitch Ratings (2014), "Fitch Ratings Sovereign 2014- Transition and Default Study", 14 Mar.
Fitch Ratings (2011), "Fitch Ratings Sovereign 2010 - Transition and Default Study", 23 Mar.

Aftermath

- … which essentially originated downgrades among developed economies.

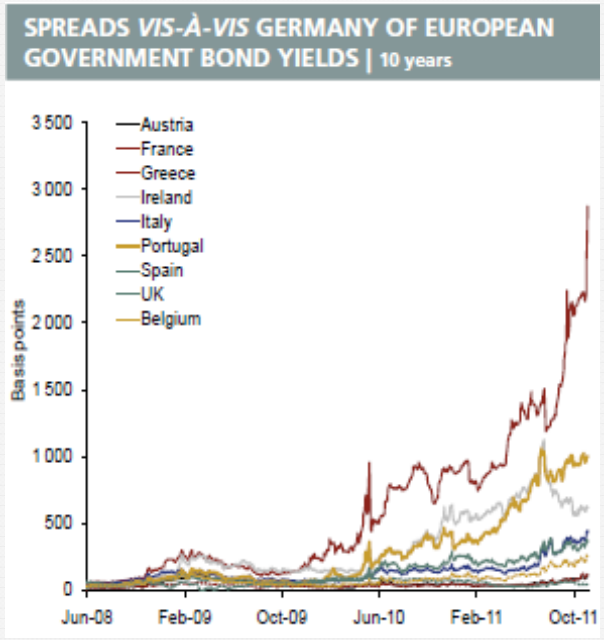


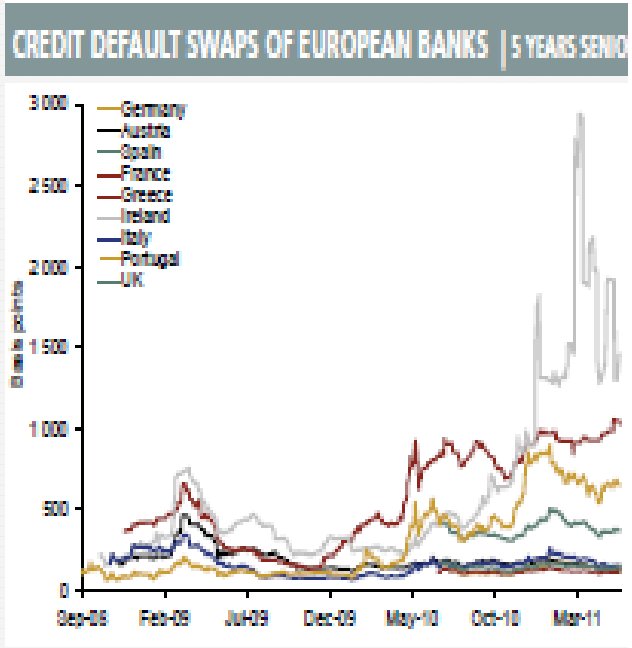


Source: Fitch Ratings (2014), "Fitch Ratings Sovereign 2014- Transition and Default Study", 14 Mar.

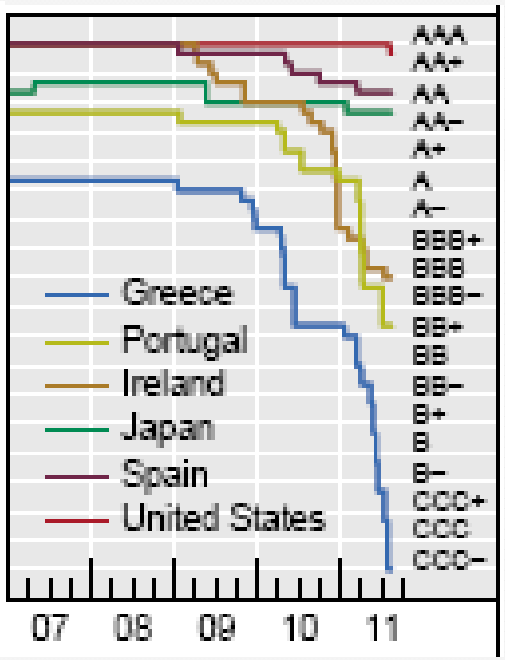
Aftermath

- The subprime crisis led to a significant revision of risk-aversion levels by investors.
- Therefore, in 2010 sovereign spreads widen and sovereign ratings fell further in the Euro Area.





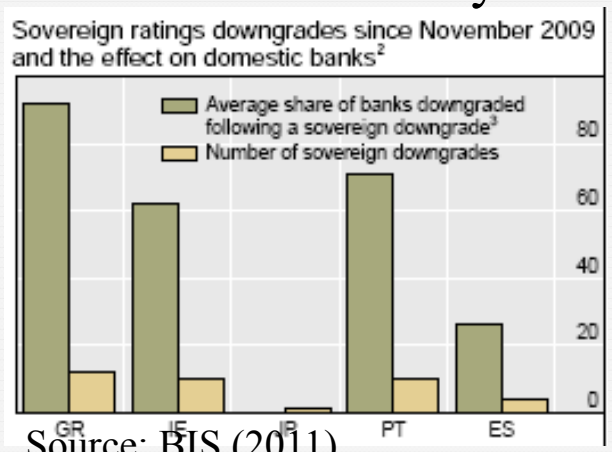
Source: Banco de Portugal (2011; 2010), ”Financial Stability Report”.



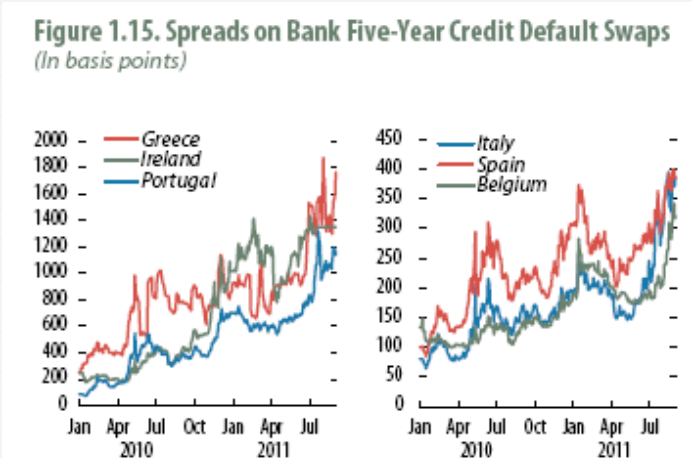
Source: BIS (2011).

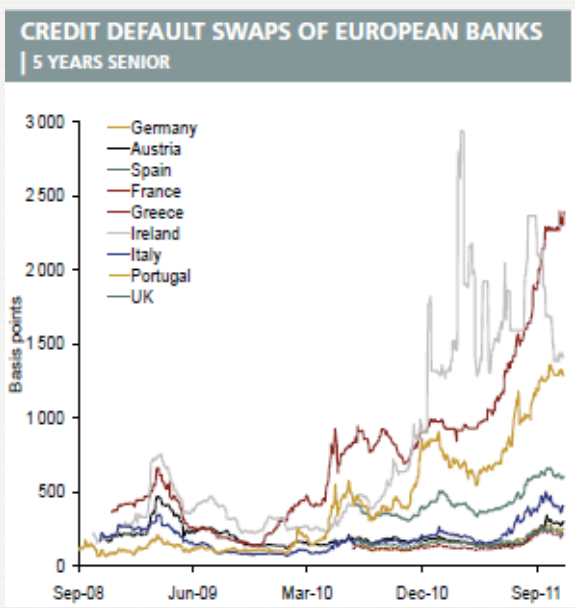
Aftermath

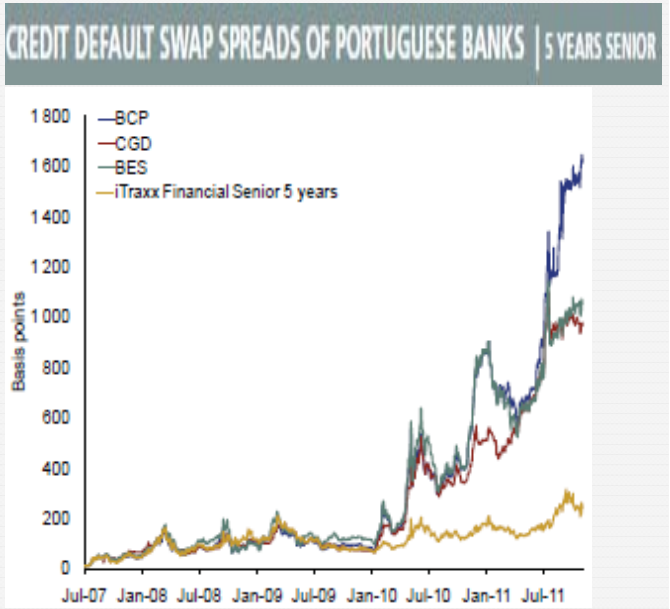
- Given the weight of sovereign debt in banks' balance sheets, second order effects on money markets, liquidity, profits and solvency were observed.



Source: BIS (2011).







Source: Banco de Portugal (2011), "Financial Stability Report", Nov.

Source: IMF (2011).

Aftermath

- Additionally, Greek Debt restructuring in 2011 impacted on banks' profits and the potential losses in other Euro area sovereign debts led the EBA to impose, on the 8th Dec.2011, a prudential filter to 71 European banks considered as systemically relevant => all potential losses in AFS portfolios impacted banks' capital => capital shortfall of around 115 B€.
- Meanwhile, on 22 Jul.13, the EBA announced the update of this filter, by considering debt prices as of end-Jun.12 => banks were required to submit new capital plans until 29.11.13.

Aggregated shortfall required by country

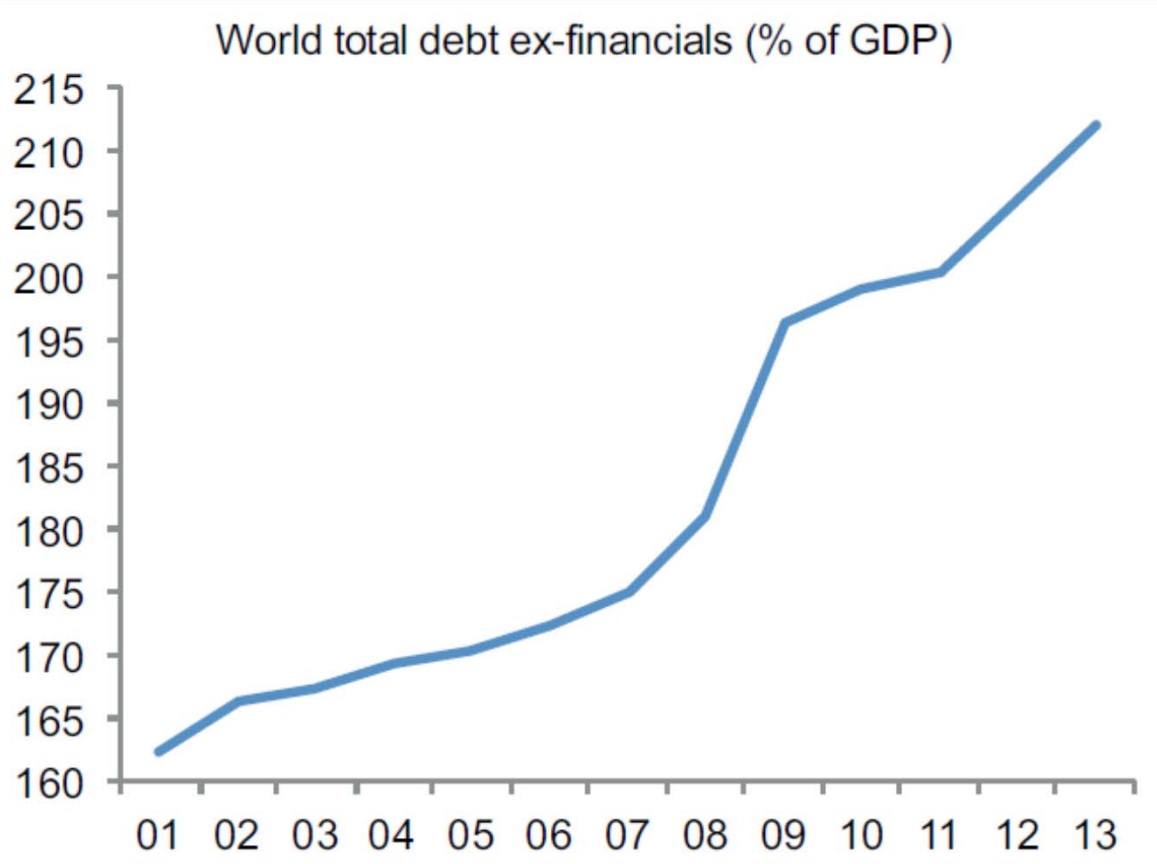
	Overall Shortfall after including sovereign capital buffer
AT [2]	3,923
BE [3]	6,313
CY	3,531
DE	13,107
DK	-
ES	26,170
FI	-
FR	7,324
GB	-
GR [1]	30,000
HU	-
IE	-
IT	15,366
LU	-
MT	-
NL	159
NO [4]	1,520
PL	-
PT	6,950
SE	-
SI	320
Total	**114,685**

Amounts are in million Euros

Source: European Banking Authority (2011), Press Release, 8th Dec.

Aftermath

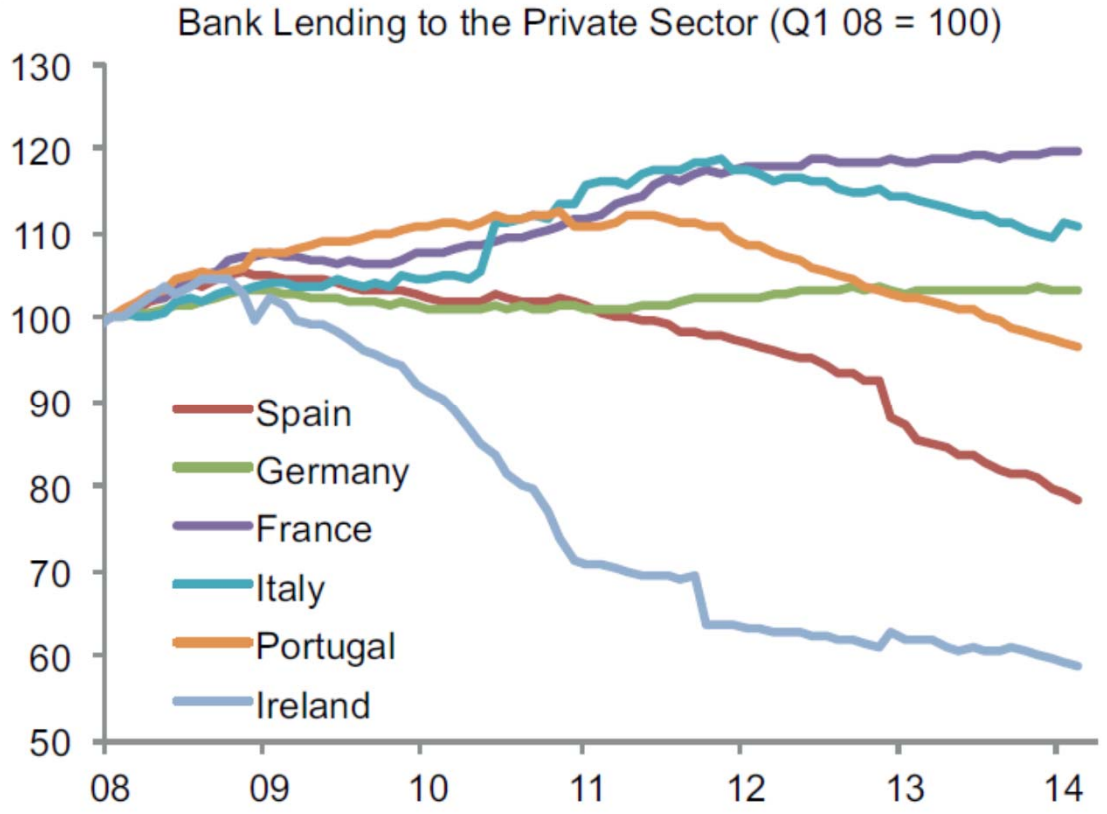
- However, the deleveraging has been modest worldwide, …



Source: Buttiglione, Luigi, Philip R. Lane, Lucrezia Reichlin and Vincent Reinhart (2014), "Deleveraging? What Deleveraging?", Geneva Reports on the World Economy 16, September.

Aftermath

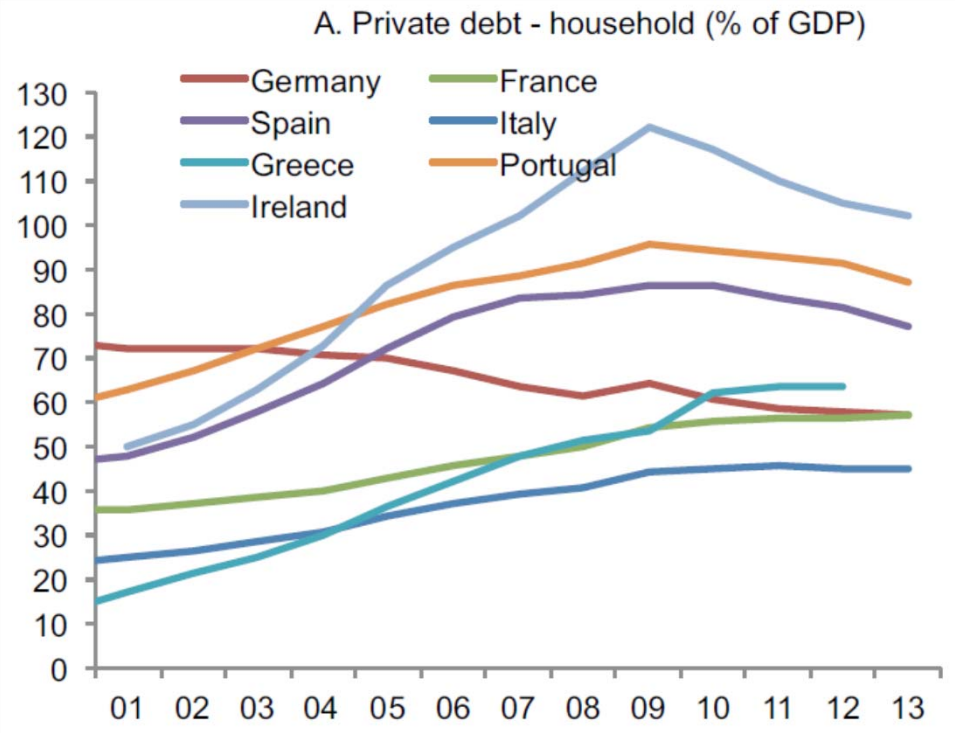
- … even though bank lending to the private sector has decreased markedly in Euro Area periphery, …

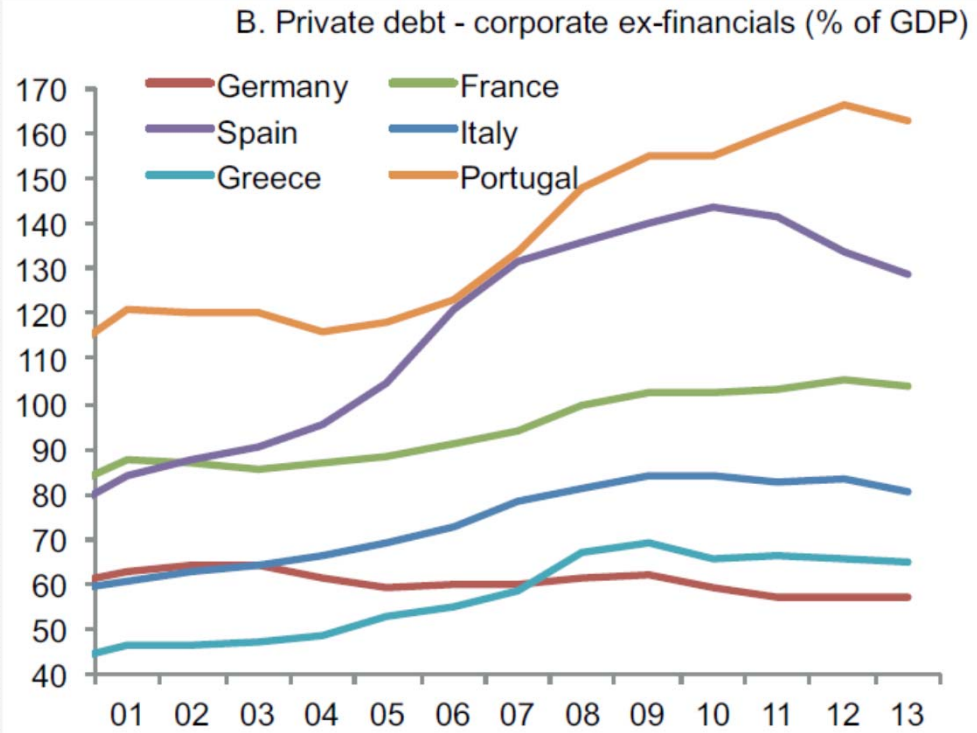


Source: Buttiglione, Luigi, Philip R. Lane, Lucrezia Reichlin and Vincent Reinhart, "Deleveraging? What Deleveraging?", Geneva Reports on the World Economy 16

Aftermath

- … allowing for the deleveraging of the private sector.

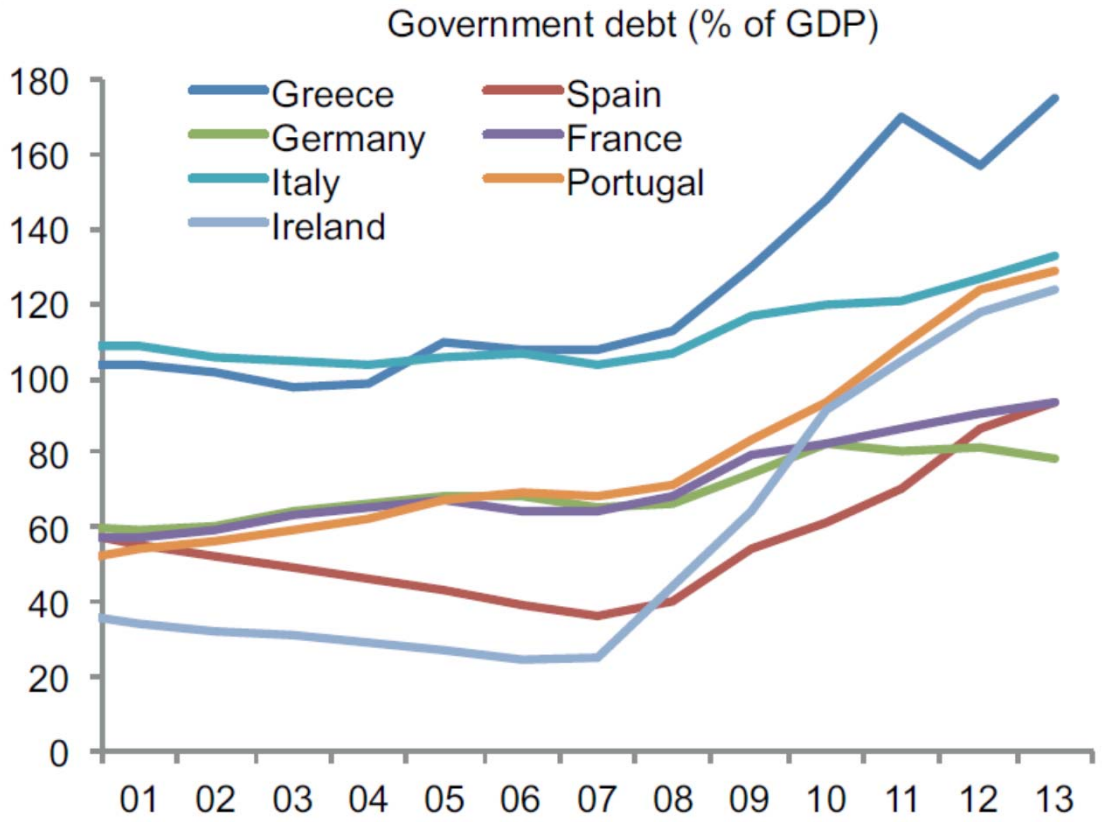




Source: Buttiglione, Luigi, Philip R. Lane, Lucrezia Reichlin and Vincent Reinhart, "Deleveraging? What Deleveraging?", Geneva Reports on the World Economy 16

Aftermath

- A major reason for the increasing aggregate debt levels is the behavior of Government Debt.



Source: Buttiglione, Luigi, Philip R. Lane, Lucrezia Reichlin and Vincent Reinhart, "Deleveraging? What Deleveraging?", Geneva Reports on the World Economy 16