

2. The Subprime Crisis and the Main Prospects for the Banking Activity

2.1. General Characterization

Financial Crises

- **Definition:** major disruptions in financial markets leading to severe business cycle downturns and characterized by:
 - sharp declines in asset prices;
 - failures of many financial and nonfinancial firms.
- **Financial crises keep occurring** as:
 - (1) all potential sources of market failures are present in banking (externalities, asymmetric information and market power), being magnified in banking due to the fragility of the bank business model, based on maturity transformation.
 - (2) regulation tends to lag behind financial innovation (e.g. securitization and credit derivatives in the recent crisis).
 - (3) banks and governments are deeply intertwined due to the money creation role of banks => complex political links between sovereign and bank solvency.

Costs of Financial Crises

- Laeven and Valencia (2008) - 42 crisis episodes, with an **average net fiscal cost of 13% of GDP**.
- Haldane (2010) - costs of past financial crises often in excess of 10% of pre-crisis GDP.
- Curry and Shibut (2000) - Fiscal cost (net of recoveries) of the 1980s US Savings and Loan Crisis = 124 B\$ (3% of GDP).

Global impact

- The Subprime Crisis was a major international financial crisis started in the US residential mortgage market and spread worldwide, leading to:
 - (i) extreme volatility in major financial markets;
 - (ii) a global liquidity crisis;
 - (iii) bank failures;
 - (iv) recessions in major economies;
 - (v) Government Debt crises, namely in the Euro Area.

Global impact

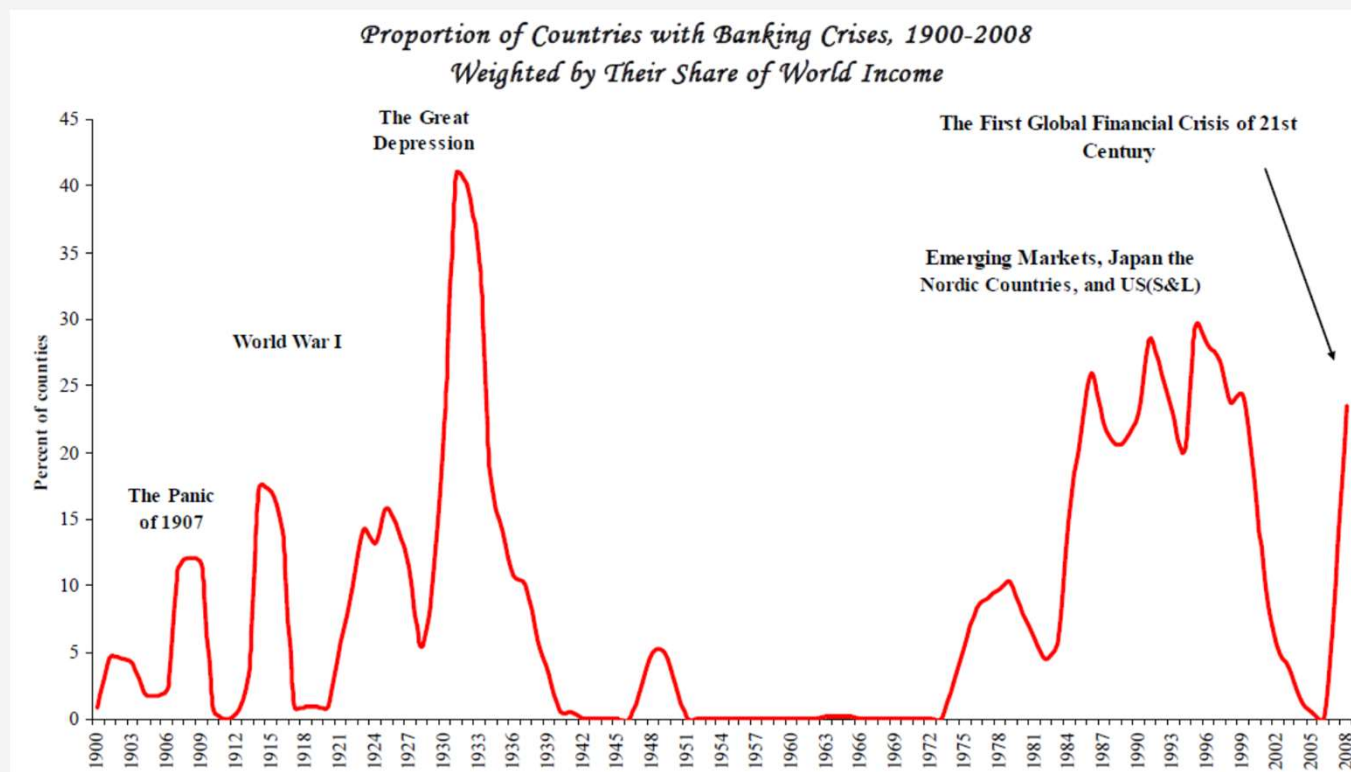
- 24 countries experienced a banking crisis between 2007 and 2008 (including bank runs and liquidations) and significant Government intervention (including recapitalizations, funding guarantees and nationalizations).

Laeven, Luc, and Fabián Valencia. 2013. "Systemic Banking Crises Database." *IMF Economic Review* 61 (2): 225–70.

- The subprime crisis had a worldwide impact, with 91 economies, representing 2/3 of the global GDP (PPP-adjusted), observing a decline in output in 2009.

Previous Crises

- Nonetheless, **Subprime crisis didn't overcome the percentage of countries affected in several previous crises.**



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

Previous Crises

- **Parallels between the subprime and the 1929 crises:**
 - (i) **Credit expansion before crisis in both cases** (roaring twenties and great moderation);
 - (ii) **Rapid financial developments**, with increasing role of the financial sector to the economy:
 - Roaring 20's – widespread access to the stock market to investors and companies;
 - Great moderation – increase of securitizations and mortgage loans.

Previous Crises

- El-Erian, Mohamed A. (2017), “The Lost Lesson of the Financial Crisis”, Project Syndicate, Aug 17:
 - “Can take a long time to develop, but once they erupt, they tend to spread rapidly, widely, violently, and (seemingly) indiscriminately”.
 - “Policymakers also have to account for the risk of a “sudden stop” to economic activity, which can devastate employment, trade, and investment.

The Great Moderation

- The subprime crisis was the end of the Great Moderation period of the 1st decade of the century, with low interest rates, inflation and asset price volatility:
“**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 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.

Stages

- The subprime crisis started in US residential real estate market and morphed afterwards into a banking, sovereign and political crisis.

Figure 1.1. Phases of the Crisis



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

Stages

- But the first signal occurred in Europe: the decision by BNP Paribas on 9 Aug.2007 to limit investors' access to the \$2.2B they had deposited in 3 funds.
- Tett, Gillian (2018), "Have we learnt the lessons of the financial crisis?", Financial Times, 31 Aug.:

When trust in the system finally did start to crack, (...) **the first signs came not in America but in Europe: BNP Paribas in France and IKB bank in Germany each announced problems with their holdings of US mortgage bonds.** The technical reasons were complex. But essentially the problem was akin to a food-poisoning scare. **As 2007 wore on, it became clear that significant numbers of American borrowers were defaulting on their mortgages; but because debt had been sliced and diced into new products, nobody knew where the poisonous risks sat in the financial food chain.** So investors simply shunned all sliced-and-diced products. That caused the markets to seize up.

2.2. Origins

Summary

- (i) Anatomy of the crisis
- (ii) Macroeconomic problems
- (iii) Financial system structural problems
- (iv) Central banking and supervision problems
- (v) Risk Management problems
- (vi) Real Estate Market problems
- (vii) Contagion

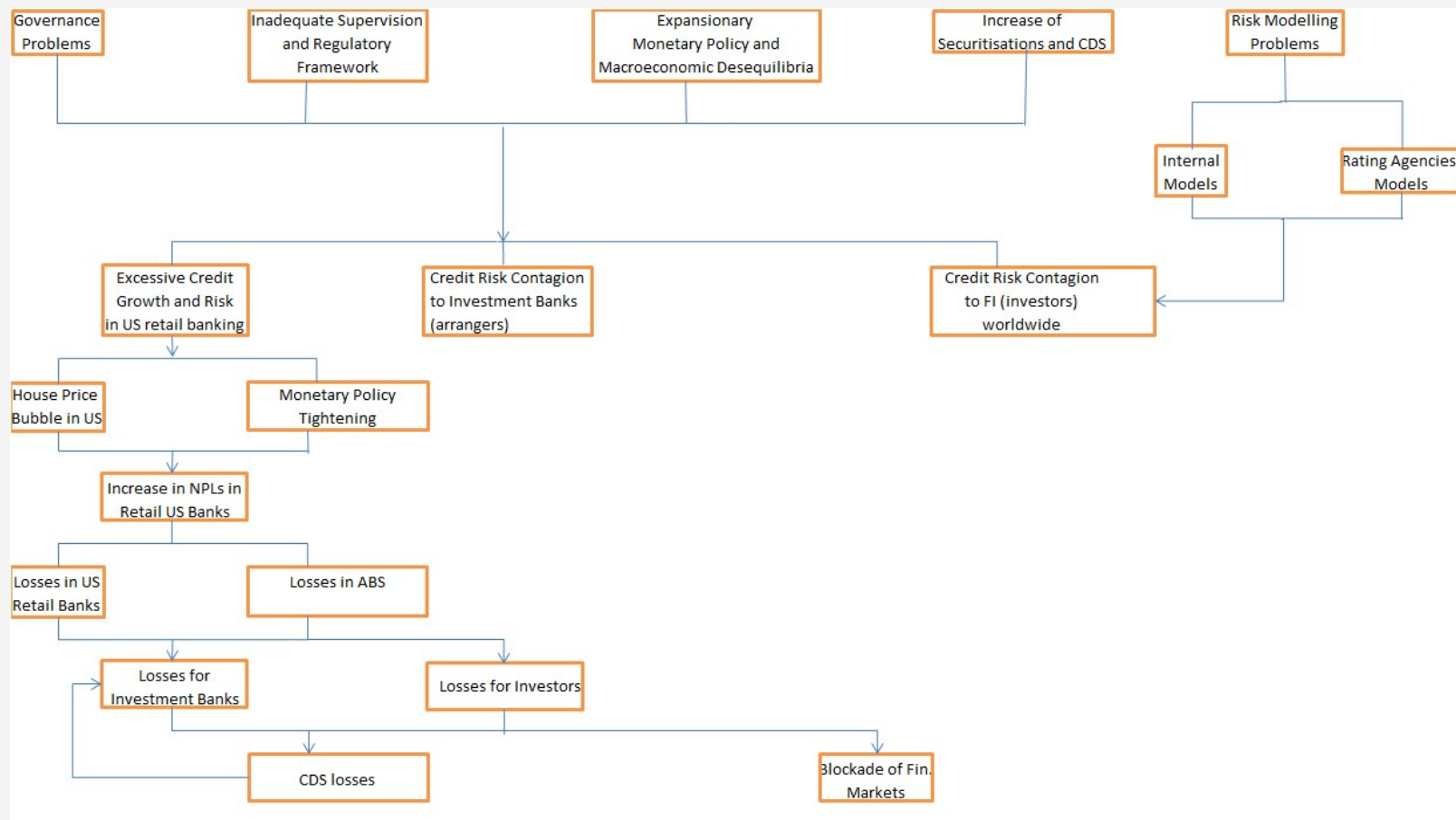
Anatomy of the crisis

- **3 central financial factors:**

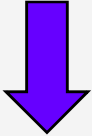
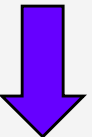
- (i) financial innovation in mortgage markets – development of structured credit products concealing the true risks;
- (ii) agency problems in mortgage markets – brokers had incentives to originate new loans regardless their risk;
- (iii) the role of asymmetric information in the credit-rating process – rating agencies faced conflicts of interest, as they rated the structured products and were also involved in the setting-up of these products.

Anatomy of the crisis

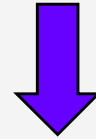
- But many other factors were key:



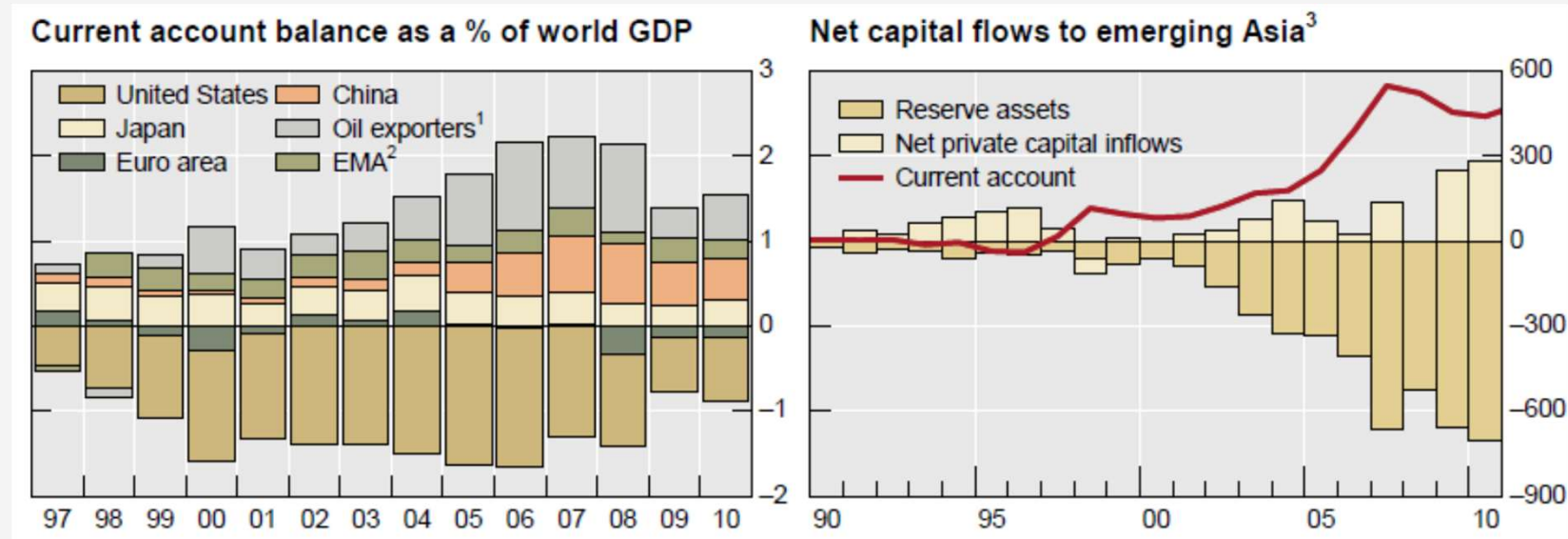
Macroeconomic Problems

- **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 low interest rate in 2002-2005 resulted from the Fed response to the dotcom crash in 2000-2001.
 - **Low interest rates triggered the accumulation of several macroeconomic disequilibria, namely current account deficits in developed countries (e.g. US).**
- 

Macroeconomic Problems



- Nonetheless, some authors raise doubts about the link between current account deficits and credit growth (e.g. Borio and Disyatat (2011), as credit also grew significantly in countries with large current account surpluses (e.g. China).



Source: Borio, Claudio and Piti Disyatat (2011), "Global imbalances and the financial crisis: Link or no link?", BIS Working Papers No 346, May.

Macroeconomic Problems

- Savings were increasingly channeled to US, due to its growing indebtedness (both Government and households).
- According to Niall Ferguson, we were living in a world with a big economy – **Chimerica**: China sold to US and the US current account and government deficit was financed by China.

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

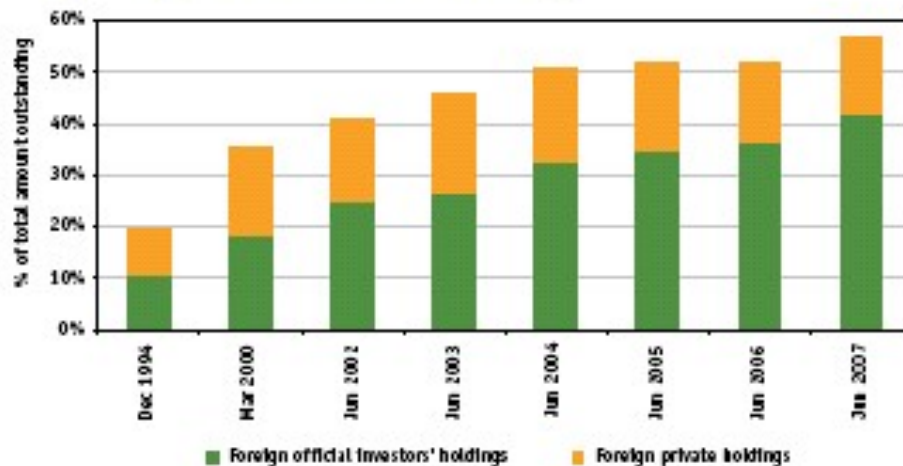
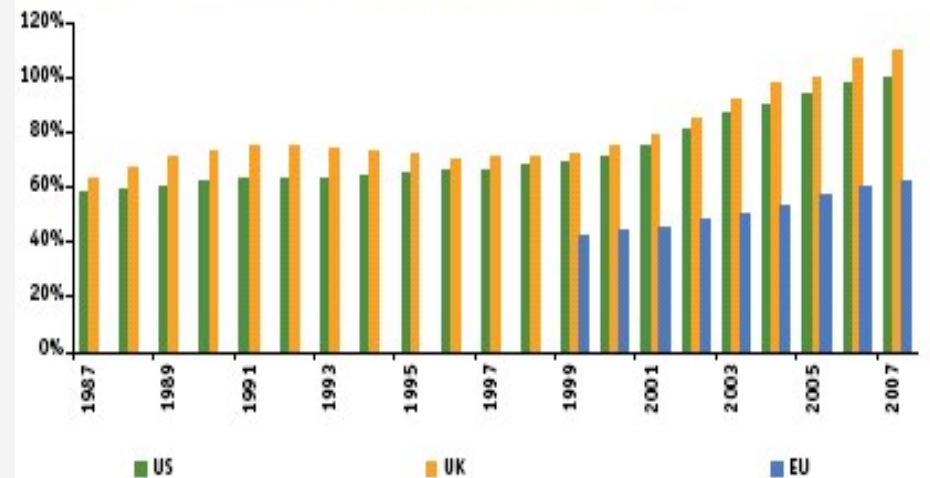


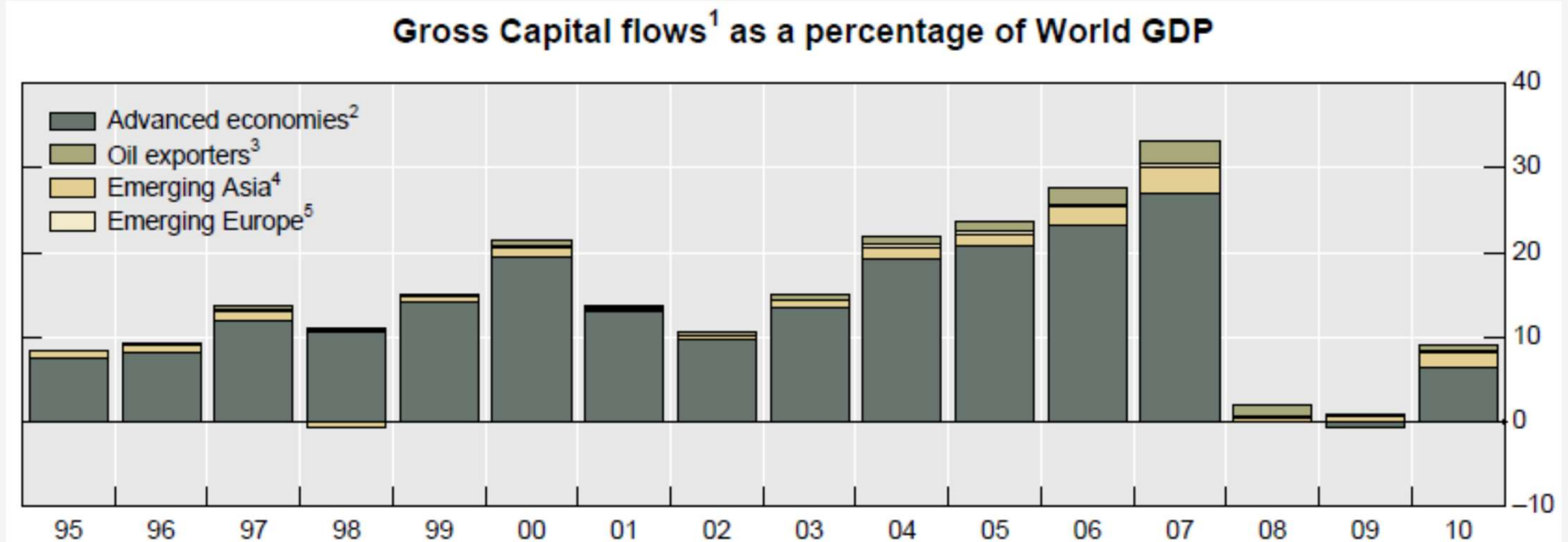
Exhibit 2.4: Household debt as proportion of the GDP



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

Macroeconomic Problems

- Capital flows reached record levels in the years before the subprime crisis:

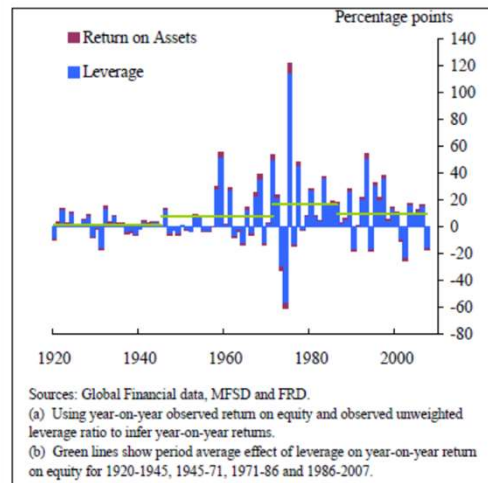


Source: Borio, Claudio and Piti Disyatat (2011), "Global imbalances and the financial crisis: Link or no link?", BIS Working Papers No 346, May.

Financial System Structural Problems

- Higher risk + lower capital \Leftrightarrow Higher leverage
- Governance
- Regulation/Supervision
- 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



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

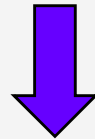
Financial System Structural Problems

- According to the Squam Lake Report, the subprime crisis revealed **4 categories of serious problems in the financial system**:
 - (i) **conflicts of interest/agency and governance problems**;
 - (ii) **difficulty in applying standard bankruptcy procedures** to FIs;
 - (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).

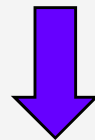
Financial System Structural Problems

(i) **conflicts of interest:**

- agency problems between shareholders (outsiders) and managers (insiders) - 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;



- **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.

Financial System Structural 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:
 - (1) 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;
 - (2) Low status and influence of risk management and control functions vis-à-vis revenue producers - arrangements that favored risk takers at the expense of independent risk managers and control personnel, e.g. remuneration;

Financial System Structural Problems

- (3) Perverse incentives from compensation plans - **insensitivity of remuneration to risk, with skewed incentives to maximize revenues** and conflicting with the control objectives;
- (4) **Inadequate/fragmented infrastructure** - hindered effective risk identification and measurement” – related to the low status of risk management function.

Financial System Structural Problems

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

- valuable knowledge accumulated by the institution 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;

Financial System Structural Problems

- “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.**

Financial System Structural Problems

- Chapter 11 in US:

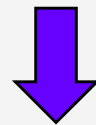
- allows both for liquidation of a firm and the sale of its assets and for continued operation of a firm under the supervision of a bankruptcy judge who protects the firm from creditors' claims while a reorganization plan is approved.
- these procedures appear to work well for nonfinancial corporations, 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.

Financial System Structural Problems

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

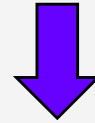
- banks typically finance a significant fraction of their business with short-term debt, that is rolled over in normal times when it matures, but not under a crisis
=> **run on corporate funding** similar to a classic run on deposits.

(iv) inadequacy of the regulatory structure

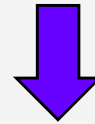


- financial regulations are typically designed to ensure the health of individual FIs, rather than the financial system as a whole - **macroprudential supervision understated vis-à-vis microprudential.**

Financial System Structural Problems

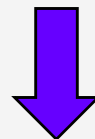


- The building-up of risks was not understood by market participants, major international entities and regulators.



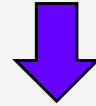
“A reasonably well supervised financial system would have been much more resilient to this and other types of severe shocks”.

in Duffie, Darrell, “Prone to Fail: The Pre-Crisis Financial System”, Journal of Economic Perspectives—
Volume 33, Number 1, Winter 2019, Pages 81–106.



- 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.

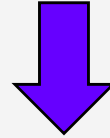
Financial System Structural Problems



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

Financial System Structural Problems

- Due to the role of the financial system in the subprime crisis and its increasing weight in the economy, the impact was much more severe in developed economies, while emerging markets weathered the crisis well.

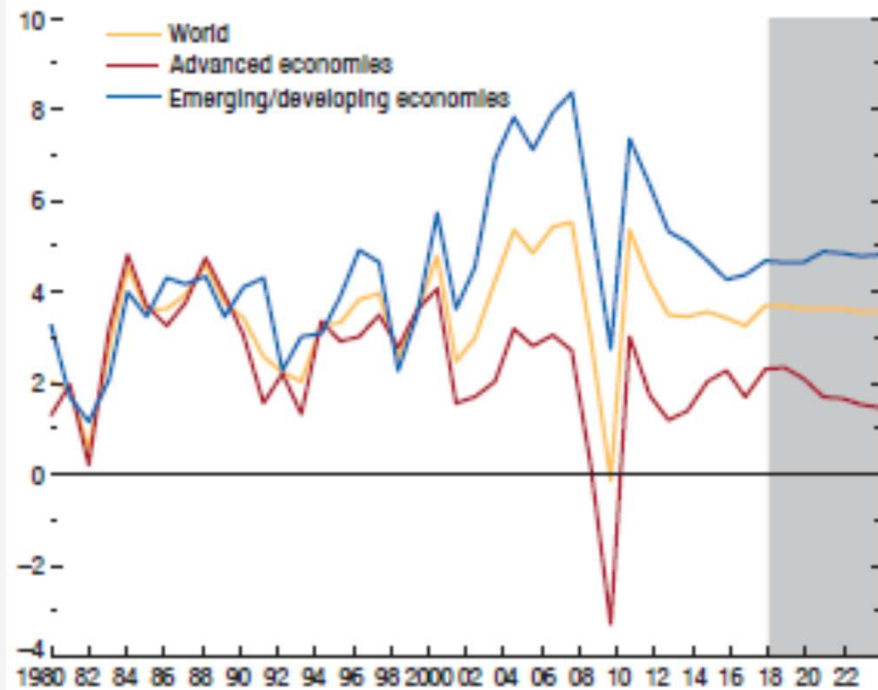


- (i) **Developing economies** - learned the lessons of the Asian crisis and implemented sound macroeconomic policies, along with macroprudential measures (v.g. IMF WEO Oct18).
- (ii) **Developed economies** - were more complacent, often assuming that mostly developing economies were subject to severe financial crises (notwithstanding the contradictory evidence of the LTCM failure in 1998).

Financial System Structural Problems

- Therefore, economic growth in emerging markets stayed higher than in developed economies.

Figure 1. Real GDP Growth, by Country Group
(Year over year)

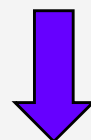


Source: IMF (2018), “World Economic Outlook”, 2018.

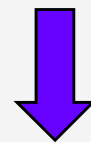
Central Banking and Supervision Problems

- 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 30s, e.g. Friedrich Hayek, Irving Fisher or John M. Keynes recognized 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)).

Central Banking and Supervision Problems

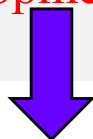
■ Reasons for this **benign view**:

(1) Economic history - suggests that (at least) early stages of economic development require modern financial systems:

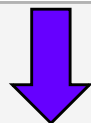
- the growth of financial markets enabled canal and railway investments in the XIX century, as well as the German and the British industrialization.

(2) Empirical evidence:

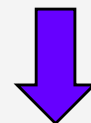
- According to Levine (2005), “financial deepening” is beneficial, with positive correlations between private sector credit and stock market turnover, on one hand, and economic growth, on the other hand (in Turner (2015)): **“better developed financial systems ease external financing constraints facing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



Central Banking and Supervision Problems



- Therefore, **increasing leverage was not relevant, being even beneficial.**




- (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.**

- **Main error behind the failure in identifying timely the subprime crisis:**

Financial markets are different from other markets and the case behind market liberalization is weaker, namely due to the macroeconomic impact of excessive credit growth.

Risk Management Problems

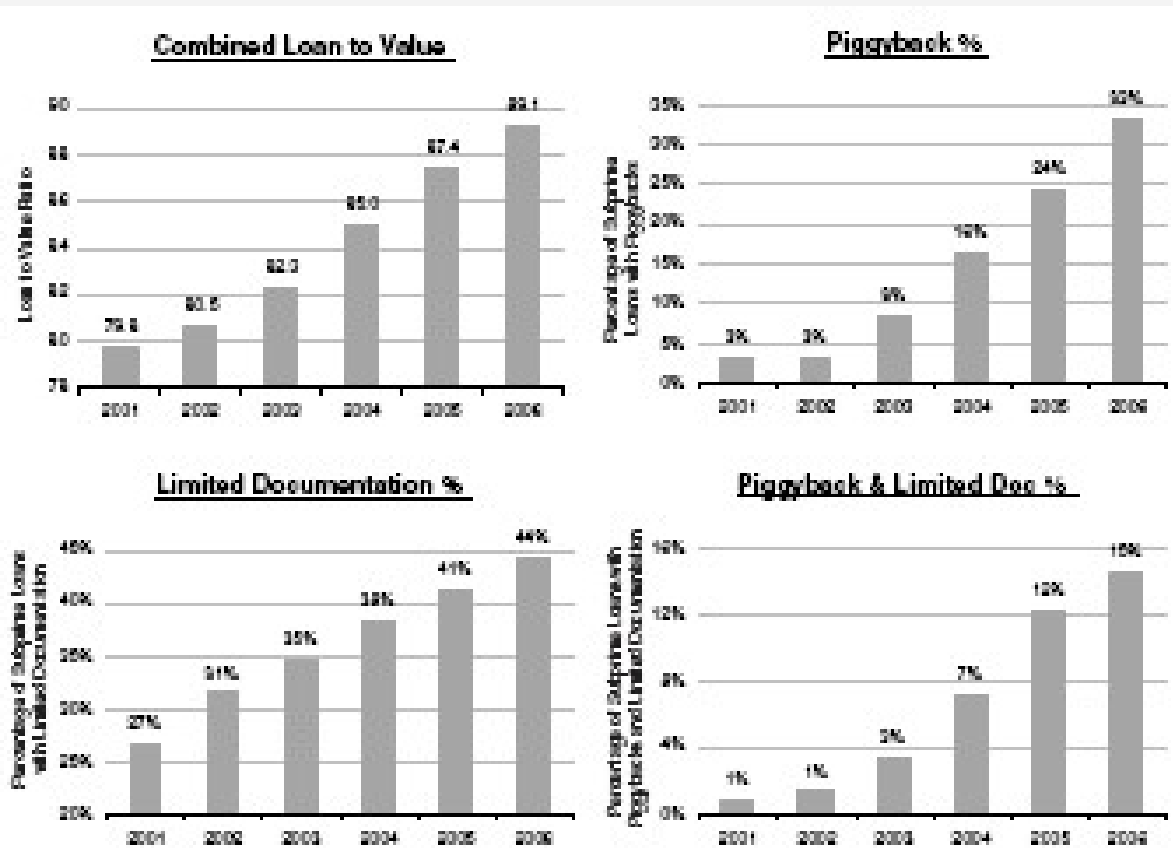
- Credit securitization was thought to reduce risk as it involved portfolio diversification, given that the behavior of the different mortgage loans involved was expected to be largely independent.
 - However, these loans became highly correlated as their behavior depended jointly on the performance of the economy, namely the unemployment rate and the interest rates.
 - When monetary policy moved interest rates sufficiently high, the economy decelerated and unemployment rates started to increase.
- 
- House prices decreased and defaults started to increase, generating a **systemic shock whose probability had been assumed to be extremely low**.

Risk Management Problems

- Therefore, **2 issues have not been properly factored-in in risk models:**
 - (i) The change in the correlation between mortgage loans
 - (ii) The probability of real estate price decreases.

Real Estate Market

- Bubble fueled by more permissive loan granting criteria – higher LTVs and less conservative requirements regarding customers' income:

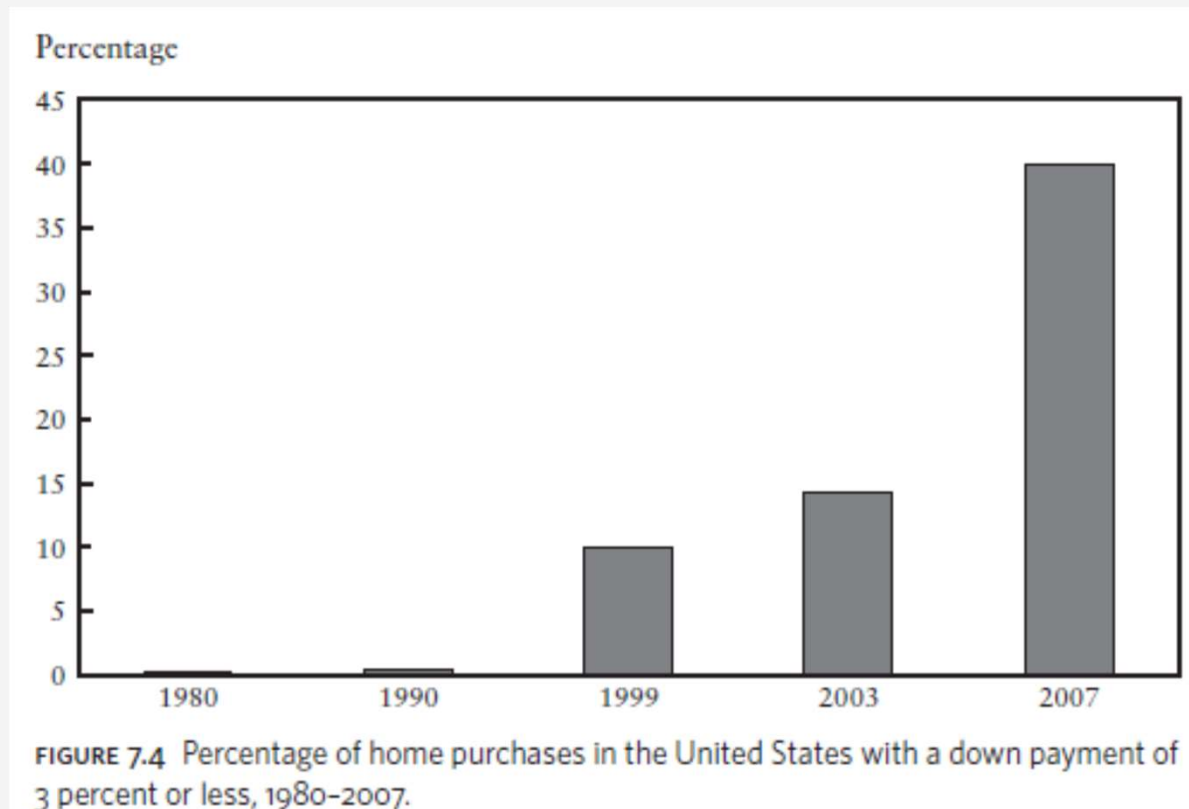


Source: Acharya, Viral, Thomas Philippon, Matthew Richardson and Nouriel Roubini (2009), "The Financial Crisis of 2007-2009: Causes and Remedies", in *Financial Markets, Institutions & Instruments*, New York University Salomon Center and Wiley Periodicals, Volume 18, Issue 2, May.

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

Real Estate Market

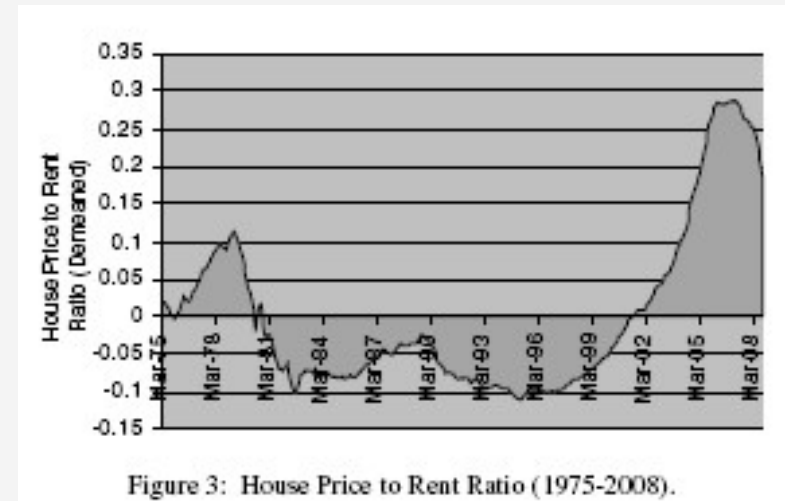
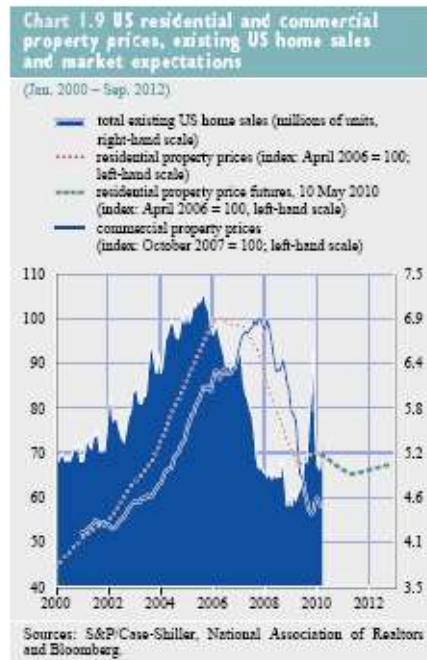
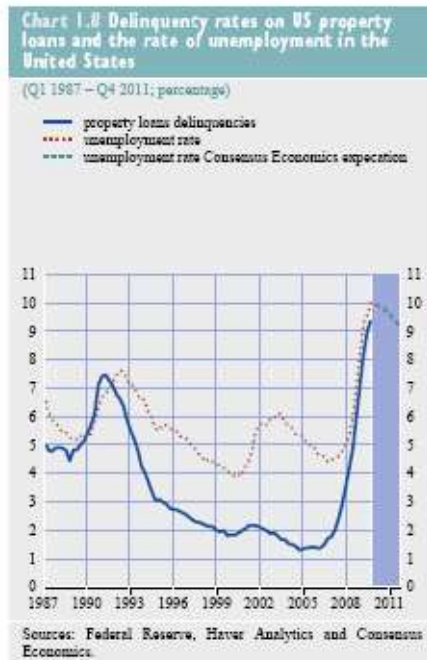
- **More than 40% of home purchases in US had a down payment not above 3% in 2007 (only 10% at the end of the previous decade).**



Calomiris, Charles W. and Stephen H. Haber (2014), "Fragile by Design – The Political Origins of Banking Crisis & Scarce Credit", Princeton University Press.

Real Estate Market

- **Too much credit** => heated domestic demand => higher real estate prices and higher interest rates => deceleration of economic activity and lower affordability => lower housing demand and higher unemployment => higher defaults=> lower prices => even higher defaults.



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.

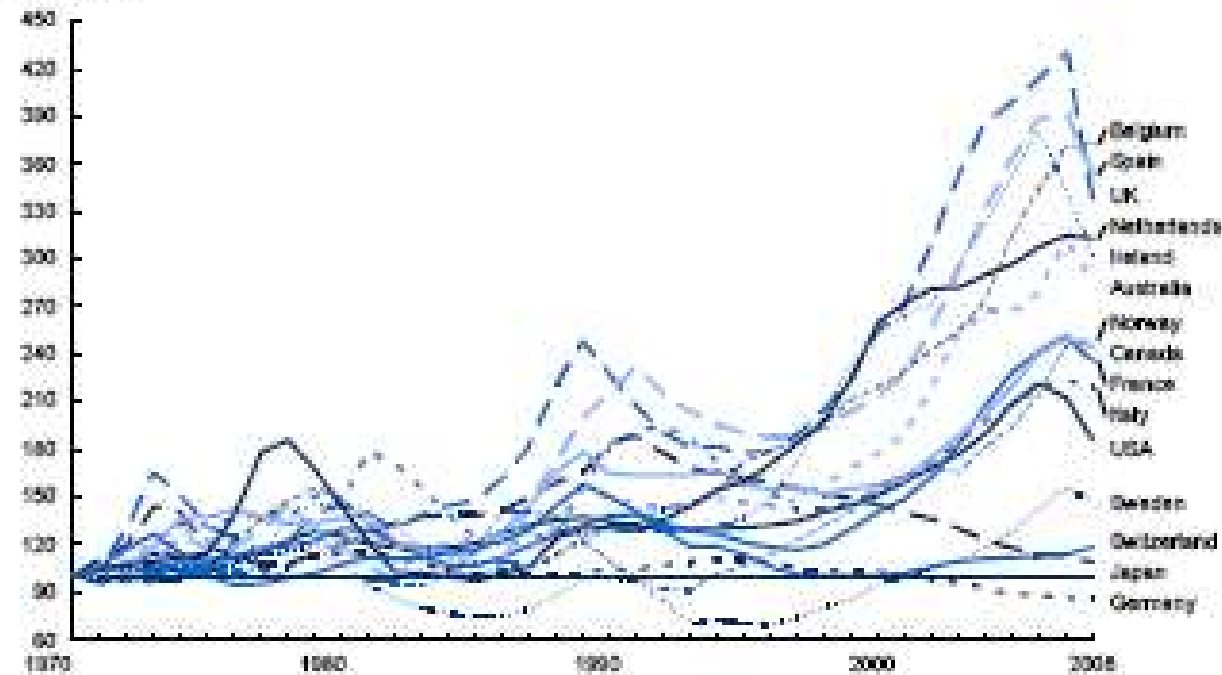
Source: European Central Bank (2010), “Financial Stability Review 2009”.

Real Estate Market

- Real Estate prices also fell in EU:

Housing price indices in many countries soared from the mid-1990s through 2007

Real house prices
1970 = 100



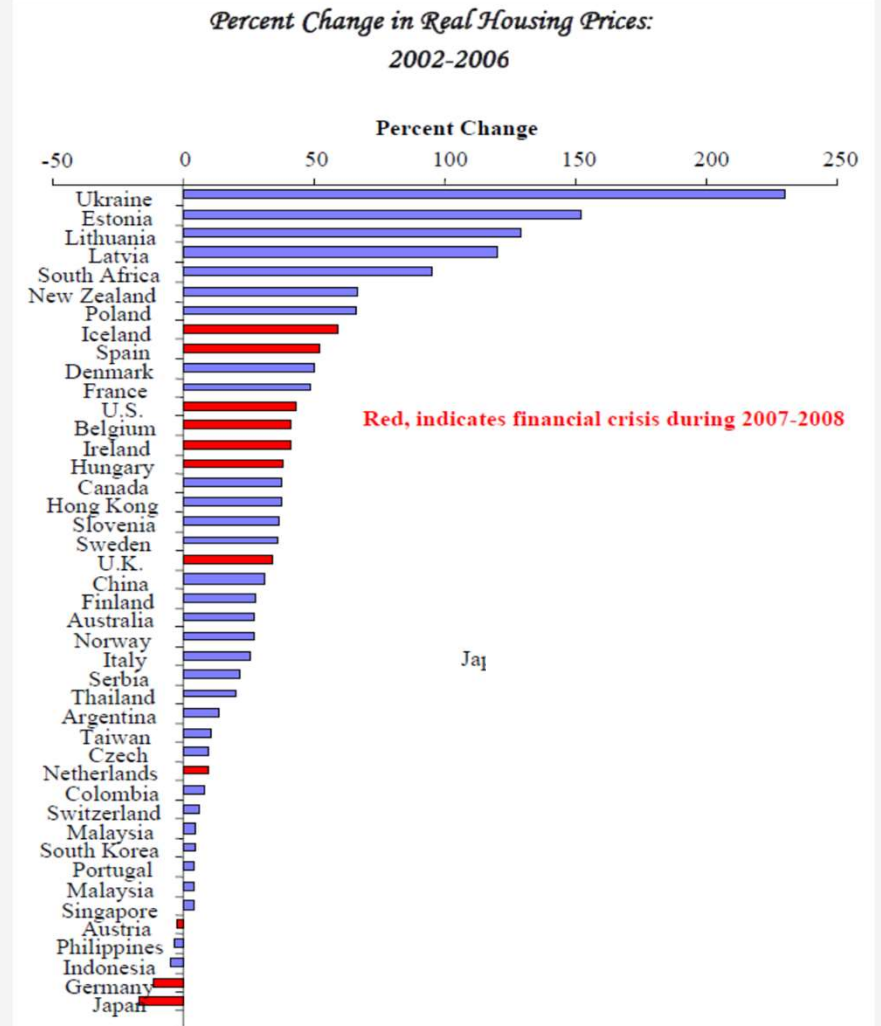
SOURCE: Bank of International Settlements, per national sources; Haver Analytics; McKinsey Global Institute analysis

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

Real Estate Market

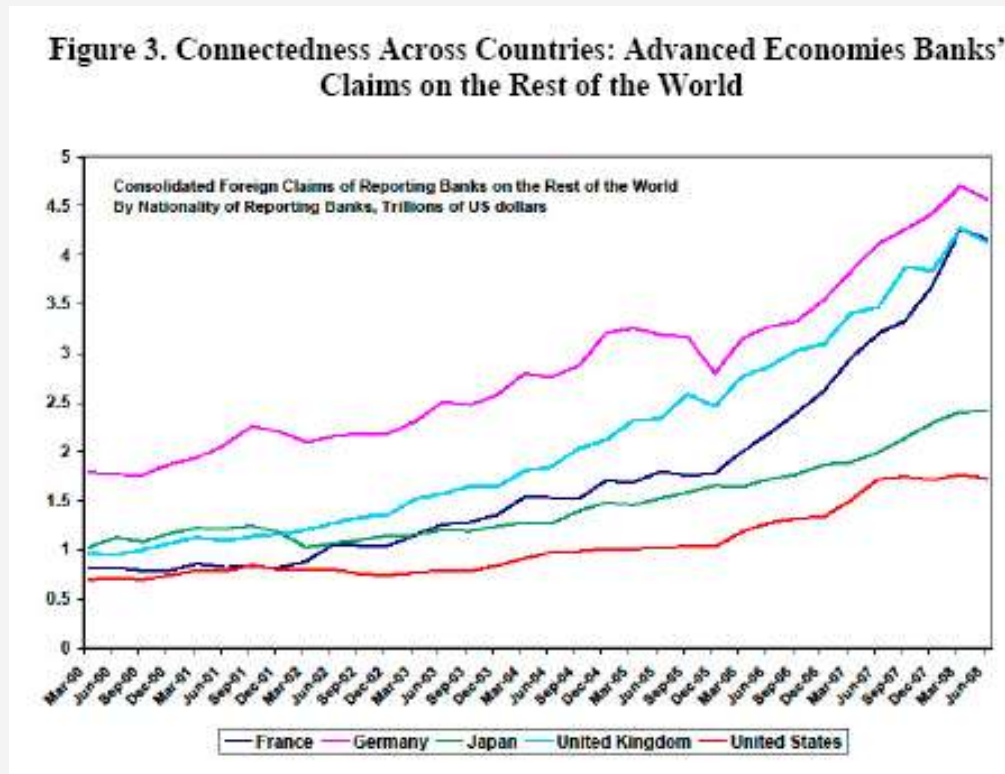
- Even though significant price increases in the real estate market were observed in many countries, financial crisis didn't afflict all of them, namely emerging markets.

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



Contagion

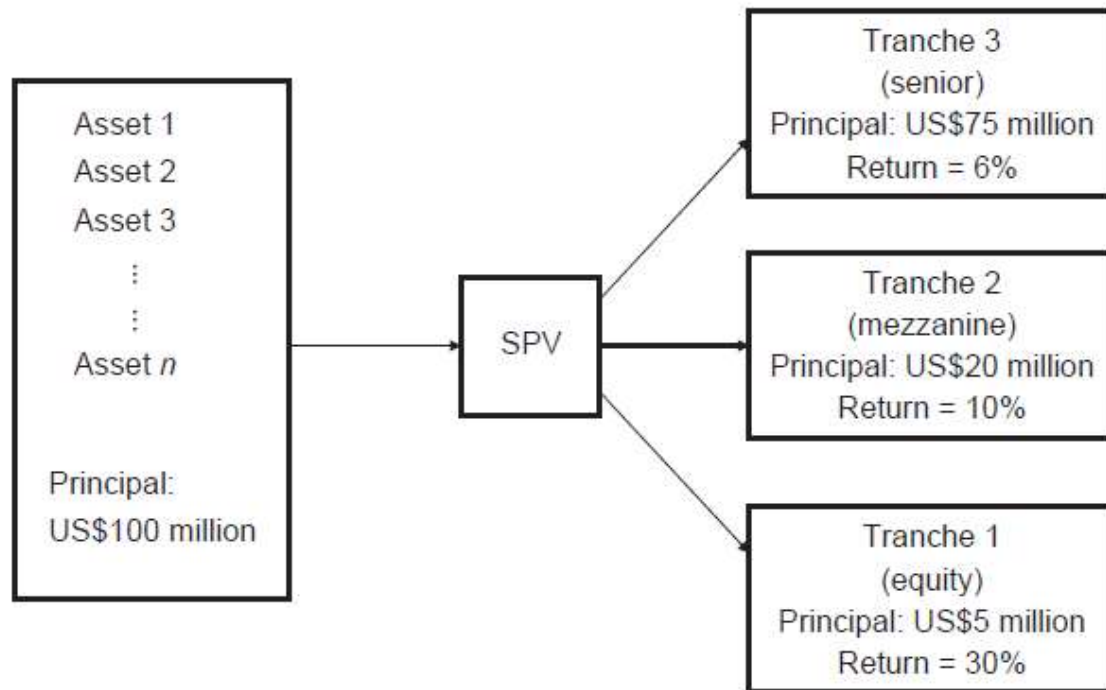
- The contagion among countries occurred through FIs, given the **increasing international connectedness** ...



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

Contagion

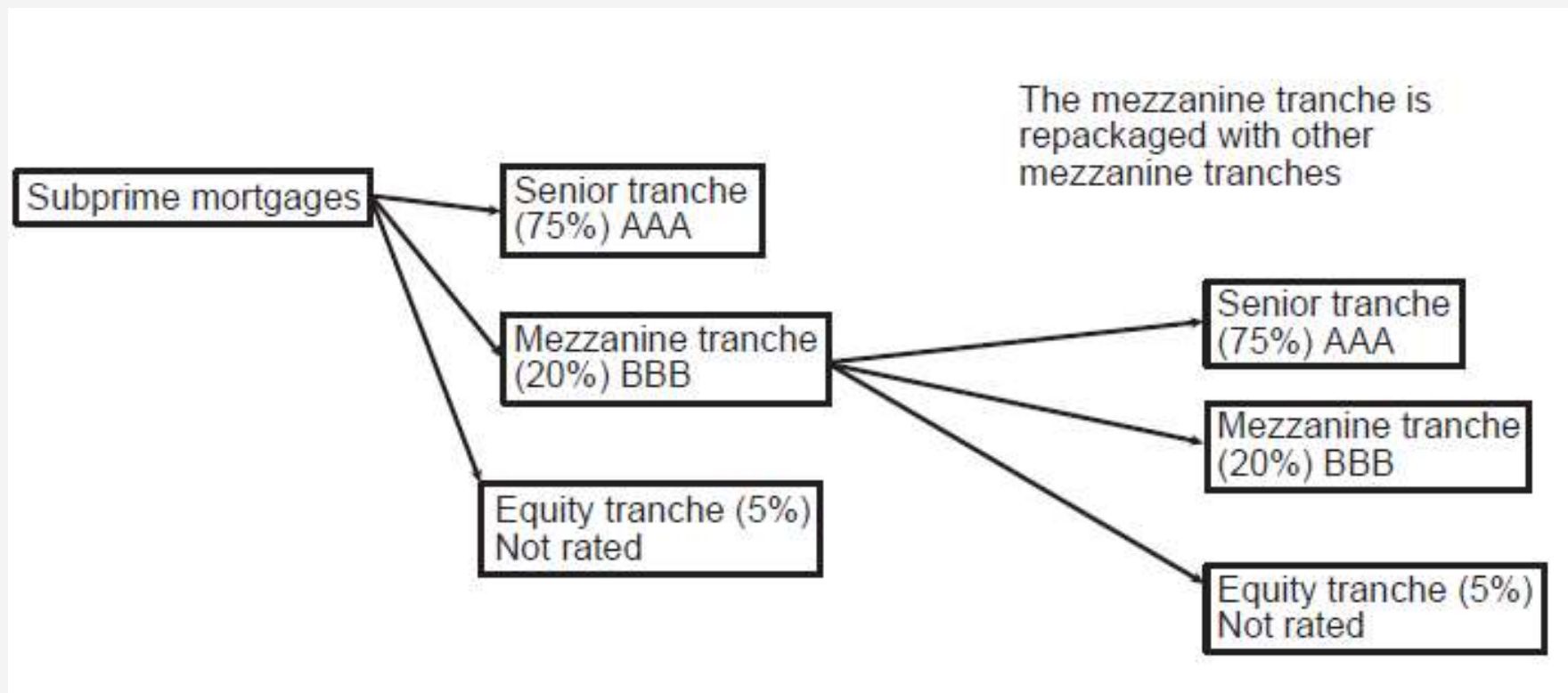
- ..., namely through the **securitization of mortgage loans**, being the securities issued by the SPVs purchased by international investors:



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

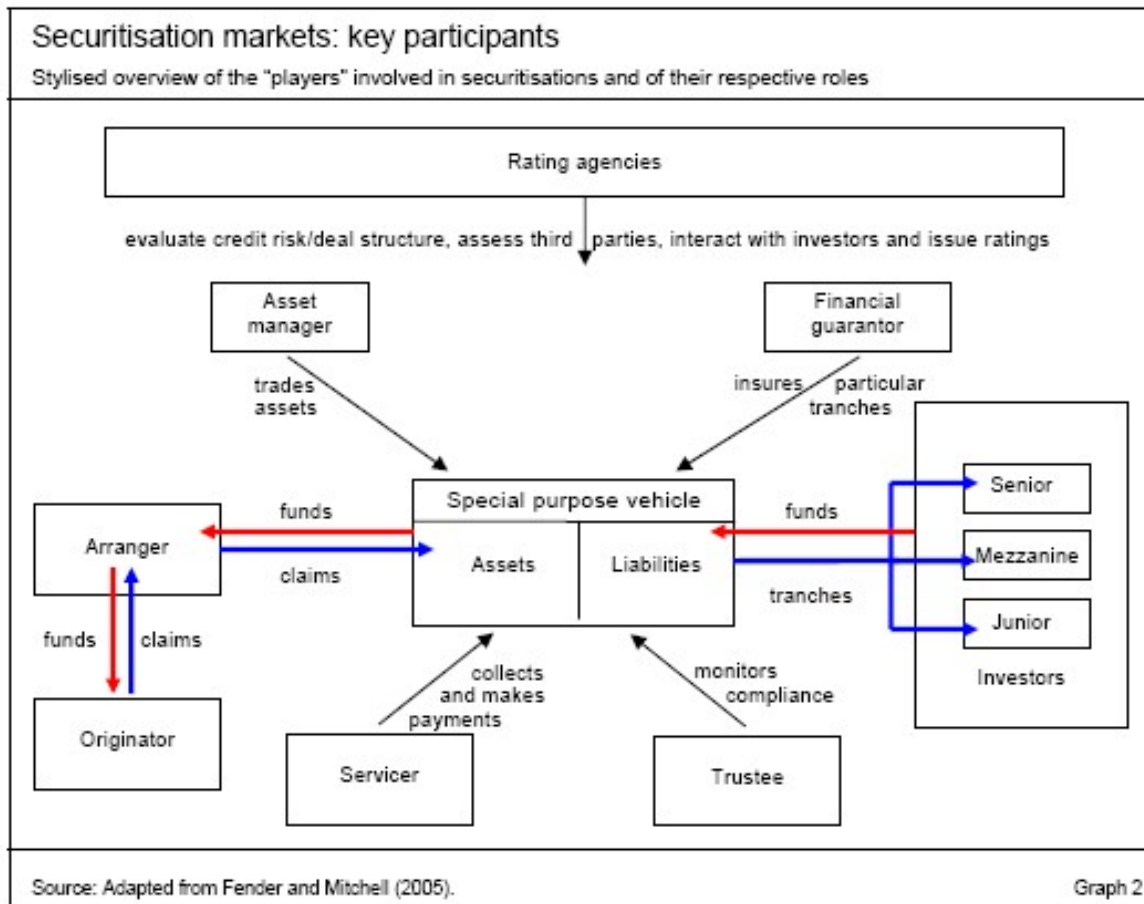
- Afterwards these ABS could originate other structures, e.g. ABS CDO...



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.

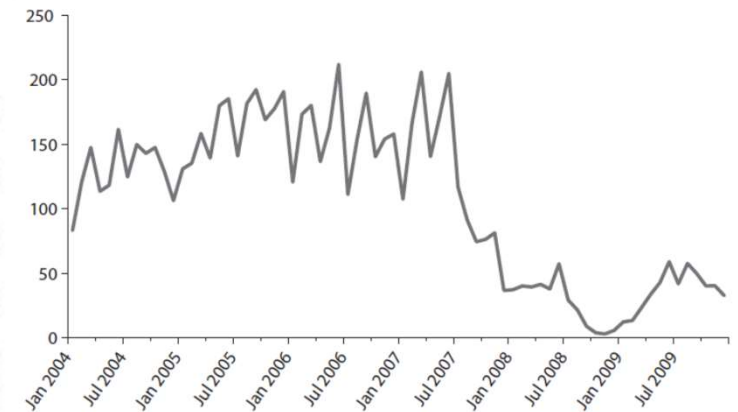
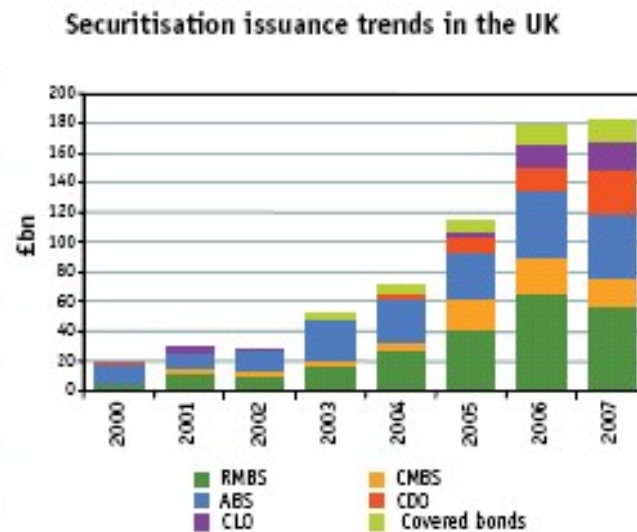
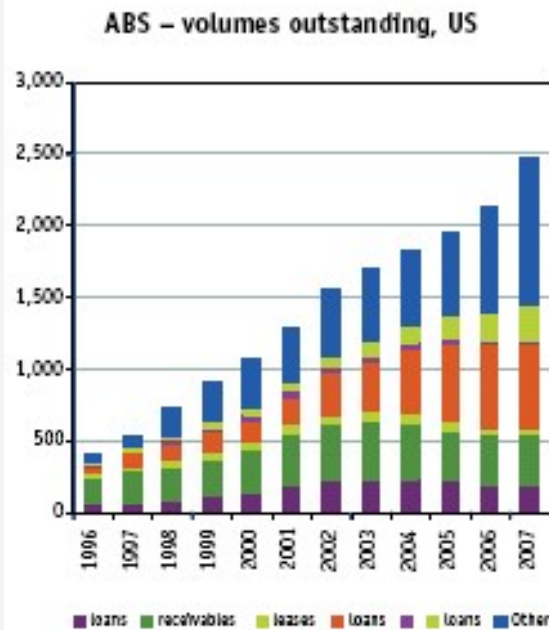


Figure 2: Asset Backed Securities Issued in the United States, January 2004 to December 2009, Billions of Dollars per Month. Source: Federal Reserve

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

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

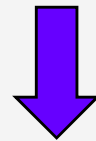
Contagion

- The volume of securitizations increased as most securities benefited from good ratings, even though most of these ratings didn't match the true credit risk, as the **risk models were flawed, underestimating the correlation between the assets.**
- **Rating agencies had evidence of these flaws** – in Dec2005, data published by Moody's on Baa-rated CDOs showed that these debts had a 5y frequency of default of 20%, while the same frequency of default for Baa-rated corporate securities was only 2%.

Contagion

Tett, Gillian (2018), “Have we learnt the lessons of the financial crisis?”, Financial Times, 31 Aug.

“But while previous generations of bankers had hung on to their loans, like farmers tending a crop, **in the late 20th century financiers became more like butchers making sausages**. They started to buy loans from anywhere they could (including each other), chop these up, and then repackage them into new instruments that could be sold to investors with fancy names such as “collateralised debt obligations” (CDOs)”.



Securitisations and CDOs were “sausages of risk”

Contagion

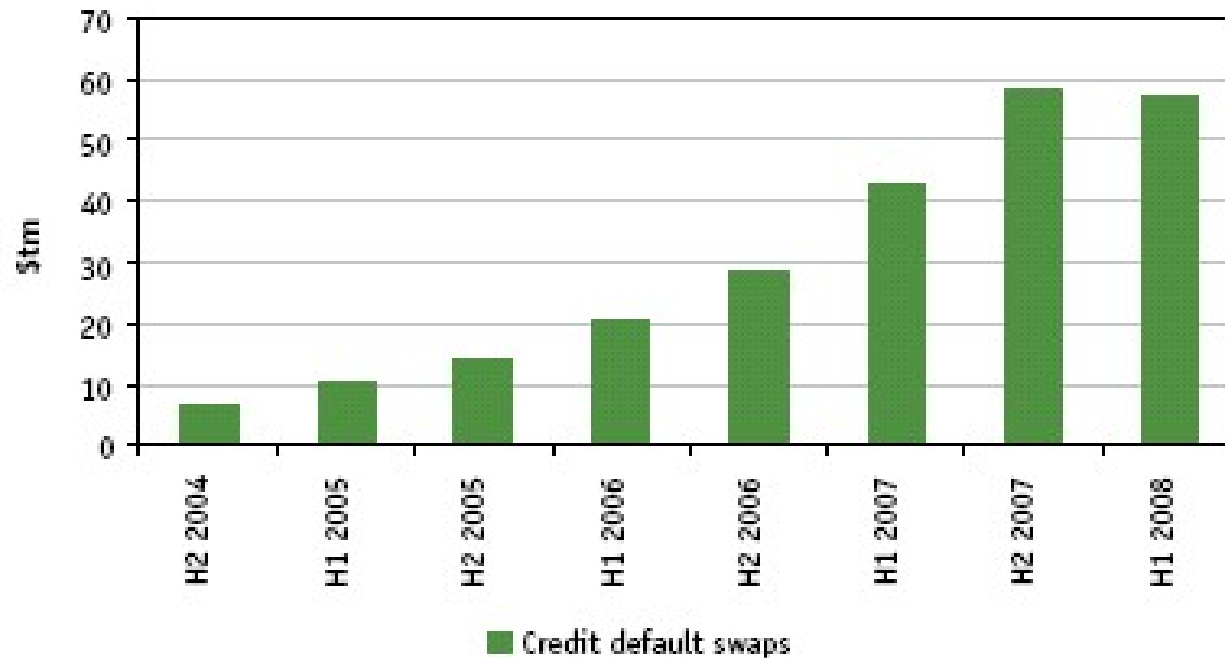
Tett, Gillian (2018), “Have we learnt the lessons of the financial crisis?”, Financial Times, 31 Aug.

“Every innovation revolution needs a sales patter, and this was no exception: the bankers told themselves that this slicing and dicing would make the financial system much safer. The idea was a modern twist on the old adage, “a problem shared is a problem halved”. In the past, banks had gone bust when borrowers defaulted because the pain was concentrated in one place; **slicing and dicing spread the pain among so many investors that it would be easier to absorb.** Or so the theory went. But there was a catch. Since the techniques that bankers were using to slice and dice the loans were desperately opaque, it was hard for anyone to know who held the risks. Worse still, because bankers were so excited about repackaging debt, they were stimulating a new mania for making loans, seemingly with government blessing. What all this financial innovation concealed was an old-fashioned credit boom, particularly in American subprime mortgages.

Contagion

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

Exhibit 2.6: Growth in outstanding credit default swaps

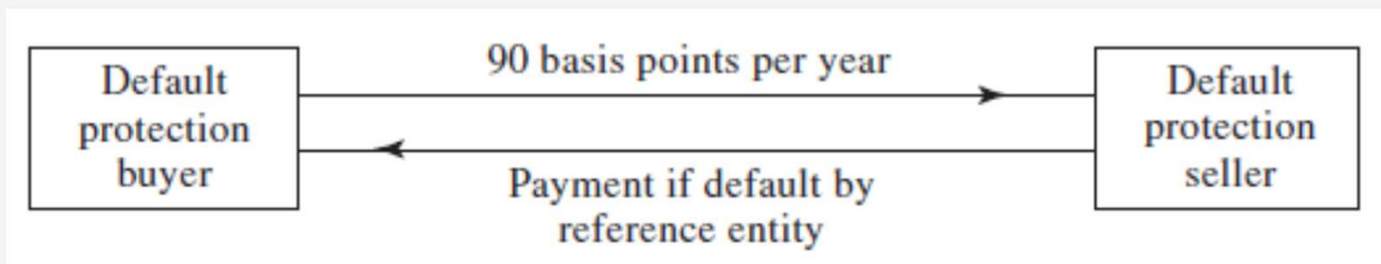


Source: Financial Services Authority (2009), “A regulatory response to the global banking crisis”, DP 09/2 (Turner Report)

Contagion

- CDS:

- the protection buyer pays a regular fee in exchange for a reimbursement if the reference entity defaults.
- the protection seller assumes the default risk of the reference entity (like when buying a bond)



Source: Hull, John (2018), "Options, futures and other derivatives", 10th Edition, Pearson.

Contagion

- The subprime crisis impacted several financial markets, from money markets to stock exchanges.

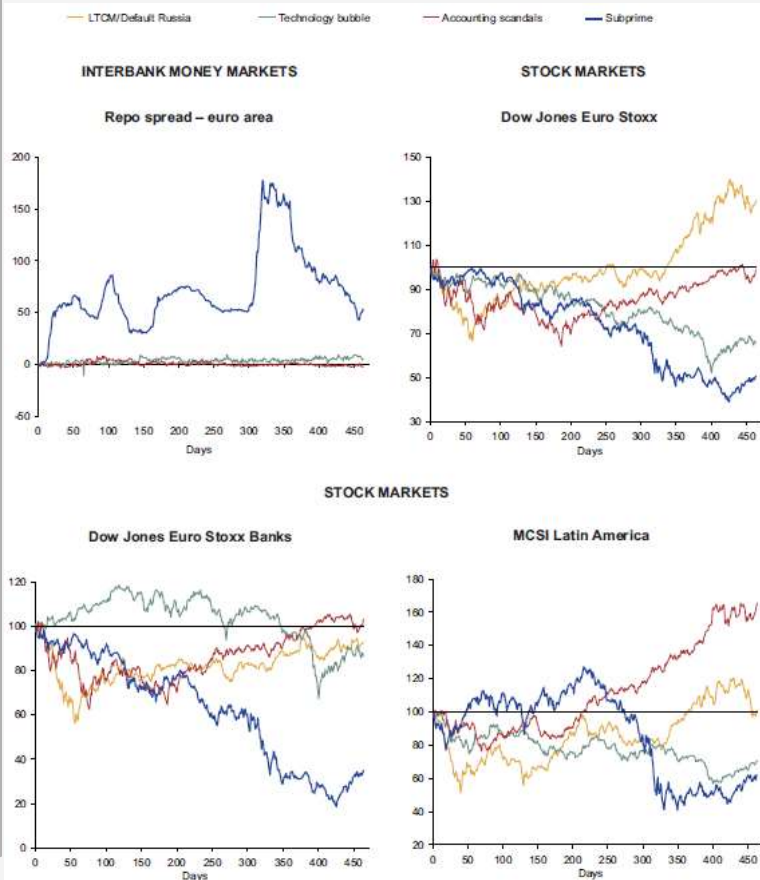
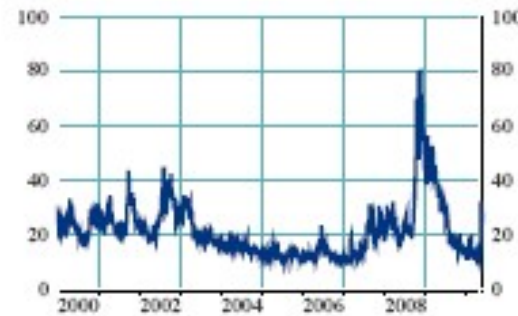


Chart S27 Implied volatility for the S&P 500 index

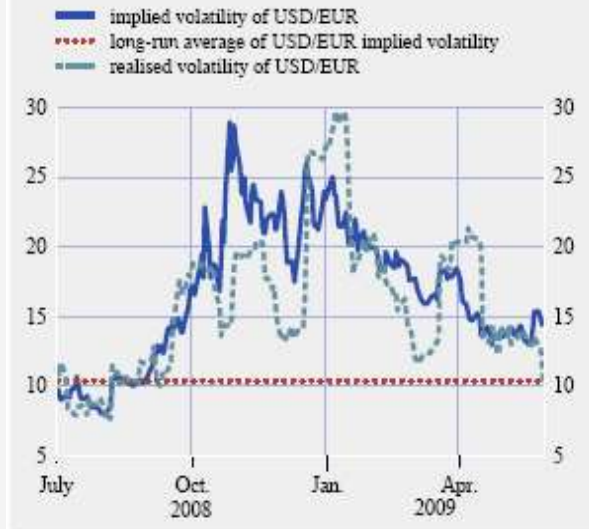
(Jan. 2000 - May 2010; percentage)



Source: Thomson Reuters Datastream.
Notes: Chicago Board Options Exchange (CBOE) Volatility Index (VIX). Data calculated as a weighted average of the closest options.

Chart 1.21 EUR/USD implied and realised volatility

(July 2008 – May 2009; percentage)



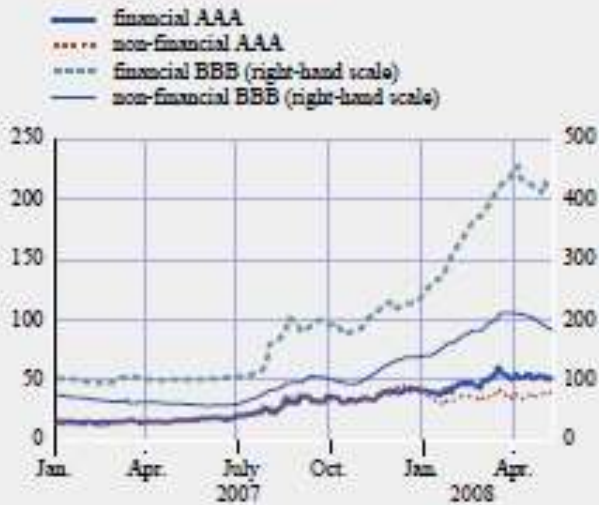
Source: ECB (2010 and 2009), Financial Stability Review.

Contagion

- Contagion between FIs => funding conditions more aggravated for FIs than for non-financial companies, namely those with higher credit risk.

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

(Jan. 2007 – May 2008; basis points)



Source: European Central Bank (2008), “Financial Stability Review”.

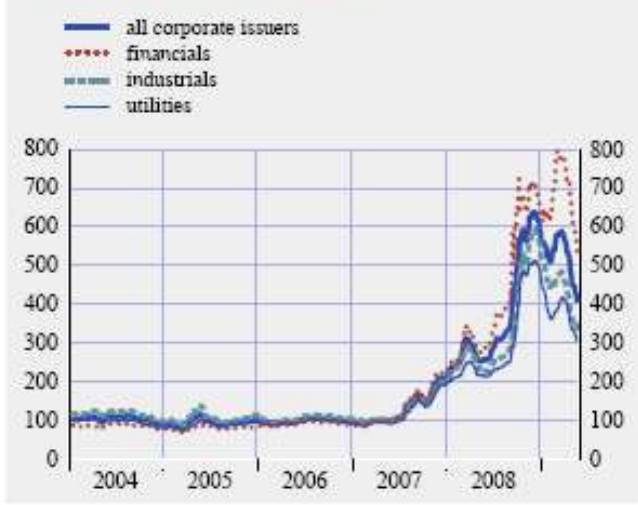
Chart 3.7 iTraxx main and senior financials indices

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



Chart 1.15 US corporate bond spreads in various sectors

(Jan. 2004 – May 2009; basis points)



Source: European Central Bank (2009), “Financial Stability Review”.

2.3. Historical Context

Summary

- (i) Banking crises
- (ii) Twin Crises
- (iii) Macro impacts
 - GDP deviation from trend due to recession
 - Fiscal costs
- (iv) Markets

Banking crises

- **Definition – 2 conditions** (following Laeven, Luc and Fabian Valencia (2018), “Systemic Banking Crises Revisited”, IMF WP/18/206):
 - (i) Significant signs of **financial distress** in the banking system (as indicated by significant bank runs, **severe losses in the banking system**, and/or bank liquidations).
 - (ii) **Significant banking policy intervention measures** in response to significant losses in the banking system.

Banking crises

- **Financial Distress** – increases in cost of credit intermediation, including monitoring and servicing loans.*
- **Severe losses:**
 - a country's banking system exhibits significant losses resulting in **NPL ratios > 20% or bank closures of at least 20% of banking system assets; or**
 - **fiscal restructuring costs of the banking sector are sufficiently high, exceeding 5% of GDP**".**

* Romer, Christina D. and David H. Romer (2017), "New Evidence on the Aftermath of Financial Crises in Advanced Countries", *American Economic Review*, Vol.107(10), pp. 3072–3118.

Bernanke, Ben S. (1983), "Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression." *American Economic Review*, Vol.73(3), pp. 257–76.

** Laeven and Valencia (2018))

Banking crises

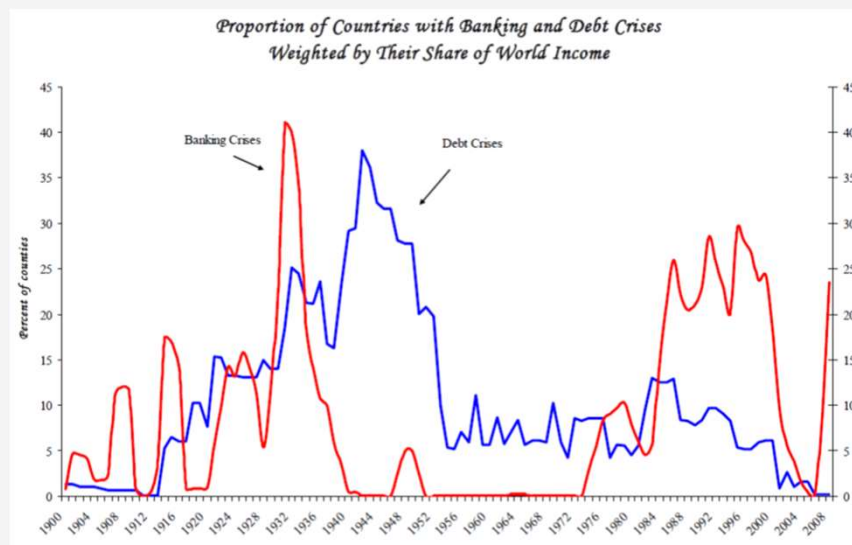
- **Significant policy interventions** - if at least 3 out of the following 6 measures have been used:*
- 1) deposit freezes and/or bank holidays;
- 2) significant bank nationalizations;
- 3) bank restructuring fiscal costs (at least 3% of GDP);
- 4) extensive liquidity support (at least 5% of deposits);
- 5) significant guarantees put in place; and
- 6) significant asset purchases (at least 5% of GDP)”.

* Laeven and Valencia (2018)

Banking crises

- The historical frequency of banking crises is quite similar in high- and middle- to-low income countries, with severe fiscal impacts:

→ 3 years after a financial crisis, central government debt increases, on average, by about 86%.



Source: Reinhart, Carmen M. and Kenneth Rogoff (2008), “Banking Crises: An Equal Opportunity Menace”, NBER wp 14587.

- The driving forces behind banking crises are also similar in the different groups of countries - asset price bubbles, large capital inflows and credit booms.

Banking crises

■ Major reasons - 3 views:

- (i) **Random events, unrelated to changes in the real economy** => panics are the result of “mobpsychology” or “masshysteria” (e.g. Kindleberger (1978)), or self-fulfilling prophecies (Diamond and Dybvig (1983)).

↳ Like Tolstoy’s unhappy families, banking crises are all unhappy in their own ways.

- (ii) **Events motivated by the business cycle** => economic downturns reduce the value of bank assets => higher chance of banks being unable to meet their commitments => depositors anticipate it and withdraw their funds (e.g. Kaminsky and Reinhart (1999)).

Banking crises

(iii) Politics or the institutional framework may facilitate or hinder banking crises – Argentina or USA (repeated crises) vs Canada (no crises):*

- **“Since the 1920s, the United States has suffered three systemic banking crises** - the widespread bank failures of the Great Depression, the savings and loan crisis of the 1980s, and the subprime crisis of 2007–09 - while **Canada has suffered none”**.

- **“The extraordinary stability of the Canadian banking system has been one of its most visible and oft-noted characteristics for nearly two centuries. Since 1840 the United States has had 12 major banking crises, while Canada has had none - not even during the Great Depression.** In fact, the last Canadian banking crisis occurred in 1839, and that was the result of contagion from the United States. Even that crisis, which forced Canada’s banks to suspend convertibility of their notes and deposits, produced no bank failures—while hundreds of U.S. banks failed”.

*according to Calomiris, Charles W. and Stephen H. Haber (2014), “Fragile by Design – The Political Origins of Banking Crisis & Scarce Credit”, Princeton University Press.

Banking crises

- “This Canadian achievement is especially remarkable in light of the fact that Canada is a staples-based economy, heavily reliant on exports, and thus largely at the mercy of international variations in its terms of trade. **Canada therefore has tended to have dramatic fluctuations in its business cycles, but these have not translated into banking crises**”.
- “More remarkable still, **the stability of Canada’s banks was accomplished with little government intervention to protect bank liabilities or shore up failing banks**. Indeed, Canada did not found a central bank until 1935, and that was done primarily because farmers in the Canadian West – displaying the understandable inflationist advocacy of commodity-producing debtors—demanded that the government pursue an activist monetary policy during the Great Depression”.

Banking crises

- “**Canada**, which shares not only a 2,000-mile border with the United States but also a common culture and language, **had only two brief and mild bank illiquidity crises during the same period, in 1837 and 1839**, neither of which involved significant bank failures. Since that time, some Canadian banks have failed, but the country has experienced no systemic banking crises. **The Canadian banking system has been extraordinarily stable**—so stable, in fact, that there has been little need for government intervention in support of the banks since Canada became an independent country in 1867”.
- How did Canada do it? Part of the answer is that **the Canadian banking system has a very different structure from that of the United States; it is composed of a small number of very large banks with nationwide branches**. This structure has not only allowed Canadian banks to diversify their loan portfolios across regions, it has also allowed them to transfer funds in order to shore up banks in regions affected by an adverse economic shock. Nationwide branch banking has also allowed Canada’s banks to capture scale economies in administration while competing among themselves for business in local markets.

Banking crises

- “Systemic bank insolvency crises (...) do not happen without warning, like earthquakes or mountain lion attacks. Rather, they occur when banking systems are made vulnerable by construction, as the result of political choices”.
- “If such catastrophes were random events, all countries would suffer them with equal frequency. The fact is, however, that some countries have had many, whereas others have few or none. The United States, for example, is highly crisis prone. It had major banking crises in 1837, 1839, 1857, 1861, 1873, 1884, 1890, 1893, 1896, 1907, the 1920s, 1930–33, the 1980s, and 2007–09.¹ That is to say, **the United States has had 14 banking crises over the past 180 years!**”

Banking crises

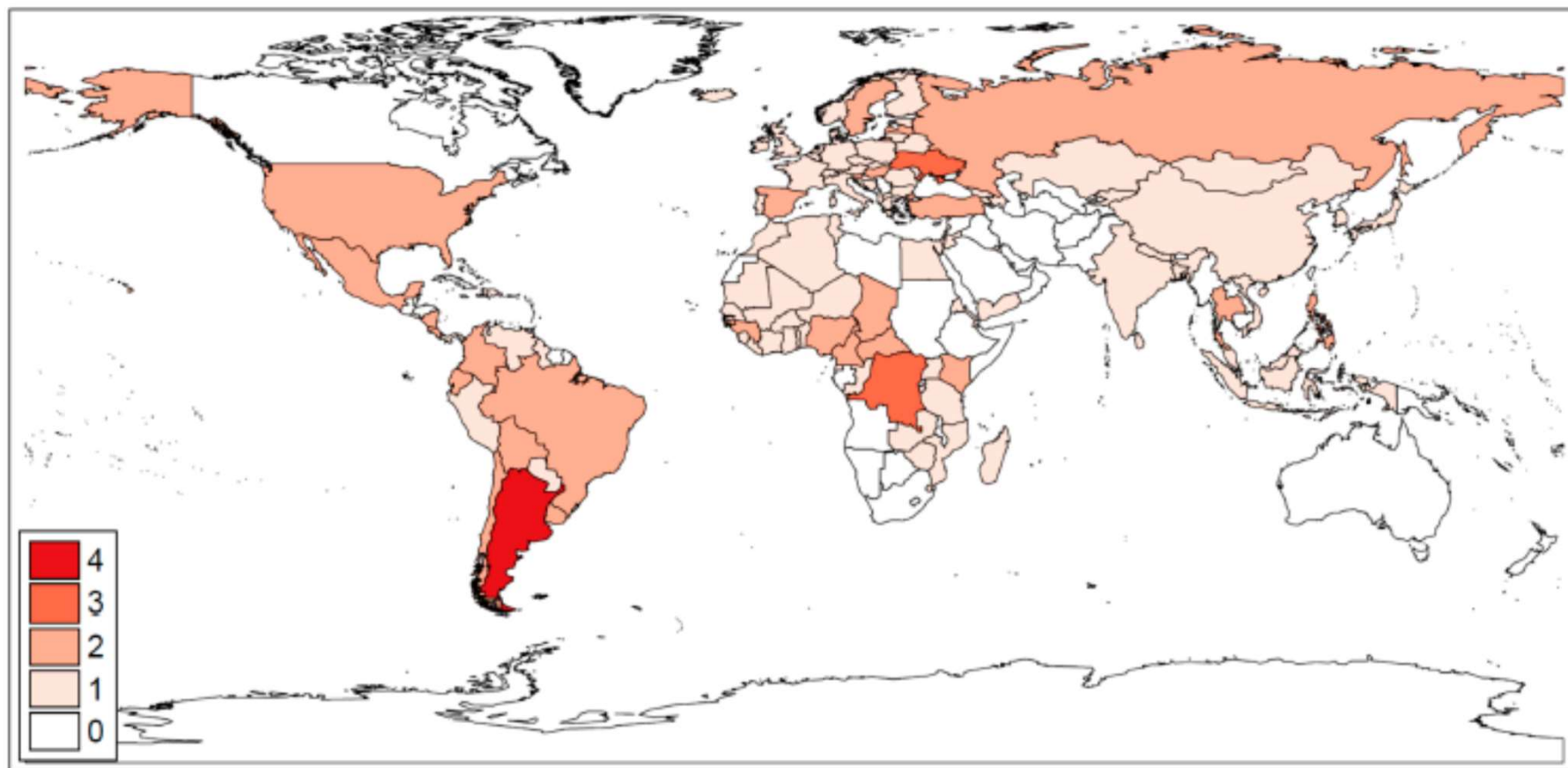
- **“Only 34 of those 117 countries (29 percent) were crisis free from 1970 to 2010. Sixty-two countries had one crisis. Nineteen countries experienced two crises. One country underwent three crises, and another weathered no less than four. That is to say, **countries that underwent banking crises outnumbered countries with stable banking systems by more than two to one**, and 18 percent of the countries in the world appear to have been preternaturally crisis prone”.***
- * Considering “117 nations of the world that have populations in excess of 250,000, are not current or former communist countries, and have banking systems large enough to report data on private credit from commercial banks for at least 14 years between 1990 and 2010 in the World Bank’s Financial Structure Database”.
- **“A country does not “choose” its banking system: rather it gets a banking system that is consistent with the institutions that govern its distribution of political power”.**

Banking crises

- **“The country that experienced the most crises was Argentina (...). The close runner-up (with three crises since 1970) was the Democratic Republic of the Congo (...). The 19 countries that had two banking crises are also far from a random draw. The list includes Chad, the Central African Republic, Cameroon, Kenya, Nigeria, the Philippines, Thailand, Turkey, Bolivia, Ecuador, Brazil, Mexico, Colombia, Costa Rica, Chile, Uruguay, Spain, Sweden and . . . the United States. One of the striking features of this list is the paucity of high-income, well-governed countries on it. Of the 117 countries in our data set, roughly one-third are categorized by the World Bank as high-income nations. But only three of the 21 crisis-prone countries, 14 percent, are in this group. This suggests that, for the most part, being crisis prone is connected to other undesirable traits and outcomes. But that raises another troubling question. Why is the United States on this list?”**

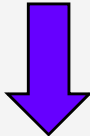
Banking crises

Figure 1. Frequency of Systemic Banking Crises Around the World, 1970–2017



Laeven, Luc and Fabian Valencia (2018), “Systemic Banking Crises Revisited”, IMF WP/18/206.

Banking crises

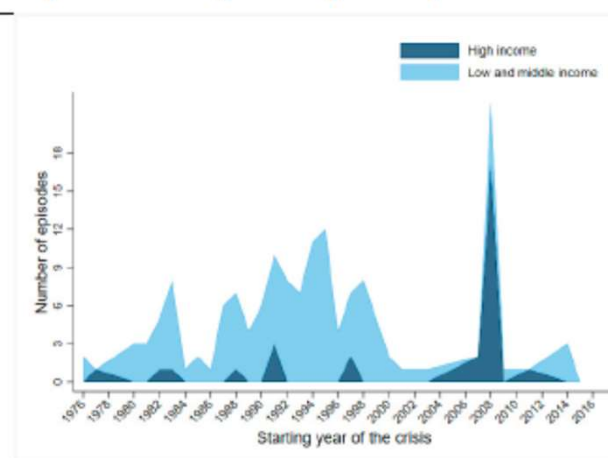
- **One of the reasons for the US to be in this list is the weight of local banks,** that can neither spread risks across regions nor move funds easily from one location to another to manage liquidity problems.
 - This weight was facilitated by the fact that banking issues were decided at a State, not at a Federal, level.
- 
- “The **structure of the Canadian banking system was therefore strikingly different:** from its beginnings, it was characterized by a **small number of very large banks** with extensive national networks of branches”.

Banking crises

- As illustrated by Laeven and Valencia (2018), “**systemic banking crises are rarely single-country events**, with waves of crises clearly visible in the figure, starting with the episodes in Latin America in the early 1980s, the crises in the aftermath of the breakup of the Soviet Union, the Tequila Crisis, the Asian crisis, and more recently the global financial crisis. The period around the mid-2000s was unusual in terms of the low incidence of crises, which was disrupted by the global financial crisis”.

Laeven, Luc and Fabian Valencia (2018), “Systemic Banking Crises Revisited”, IMF WP/18/206.

Figure 2. Systemic Banking Crises Episodes by Income Level 1970–2017



Source: Authors' calculations.

Twin Crises

- Many banking crises are simultaneously currency crises – **twin crises.**
- The average resolution cost for a twin crisis is 23% of annual GDP, vs. 4,5% for a banking crisis alone.

Table A: Selected banking crises: non-performing loans and costs of restructuring financial sectors

	Years	Duration (years)	Non-performing loans (% of total loans) ^(a)	Bank credit/GDP% ^(b)	Fiscal and quasi-fiscal costs / GDP ^(c)	GNP per head (US\$000s ^(d) PPP)	Currency crisis as well ^(e) (pre-fix **)
High-income countries							
Finland	1991-93	3	9.0*	89.9 (89.9)	11.0	15.8	Yes**
Japan	1992-98	7	13.0	119.5 (182.5)	8.0(17) ^(f)	21.5	No
Korea	1997-		30-40	70.3 (82.2)	34.0	14.7	Yes**
Norway	1988-92	5	9.0*	61.2 (79.6)	8.0	17.3	No
Spain	1977-85	9	n/a	68.1 (75.1)	16.8	4.7	Yes
Sweden	1991	1	11.0*	50.8 (128.5)	4.0	17.2	Yes**
United States	1984-91	8	4.0*	42.7 (45.9)	3.2 ^(g)	15.2	No
Average		5.5	13.5	71.8 (97.7)	12.1	15.2	
Medium and low-income countries							
Argentina	1980-82	3	9.0*	29.8 (33.0)	55.3	6.4	Yes**
Argentina	1995	1	n/a	19.7 (20.0)	1.6	10.5	No
Brazil	1994-96	3	15.0	31.7 (36.5)	5-10	6.1	No
Chile	1981-83	3	19.0	58.8 (60.2)	41.2	2.7	Yes**
Colombia	1982-87	6	25.0*	14.7 (14.7)	5.0	2.9	Yes**
Ghana	1982-89	8	n/a	25.2 (25.2)	6.0	0.9	Yes**
Indonesia	1994	1	n/a	51.9 (51.9)	1.8	2.5	No
Indonesia	1997-		65-75	60.8 (60.8)	50-55	3.0	Yes**
Malaysia	1985-88	4	33.0*	64.5 (91.8)	4.7	3.3	No
Mexico	1994-95	2	11.0*	31.0 (36.3)	20.0	7.2	Yes**
Philippines	1981-87	7	n/a	23.2 (31.0)	3.0	2.4	Yes
Sri Lanka	1989-93	5	35.0	21.3 (21.3)	5.0	1.9	No
Thailand	1983-87	5	15.0*	44.5 (48.5)	1.5	1.7	No
Thailand	1997-		46.0	118.8 (134.9)	42.3	6.2	Yes**
Turkey	1994	1	n/a	14.2 (15.3)	1.1	5.4	Yes
Uruguay	1981-84	4	n/a	33.4 (47.8)	31.2	4.6	Yes**
Venezuela	1994-95 ^(h)	2	n/a	8.9 (12.3)	20.0	5.6	Yes
Average		3.7	27.8	38.4 (43.6)	17.6	4.3	
Average all countries		4.2	22.4	48.1 (59.4)	16.0	7.5	
Of which: twin crises		4.1	26.1	46.5 (56.5)	22.9		
Banking crisis alone		4.3	17.7	50.8 (64.2)	4.6		

Source: Hoggarth, Glenn, Ricardo Reis and Victoria Saporta (2001), “Costs of banking system instability: some empirical evidence”, Bank of England working paper.

Twin Crises

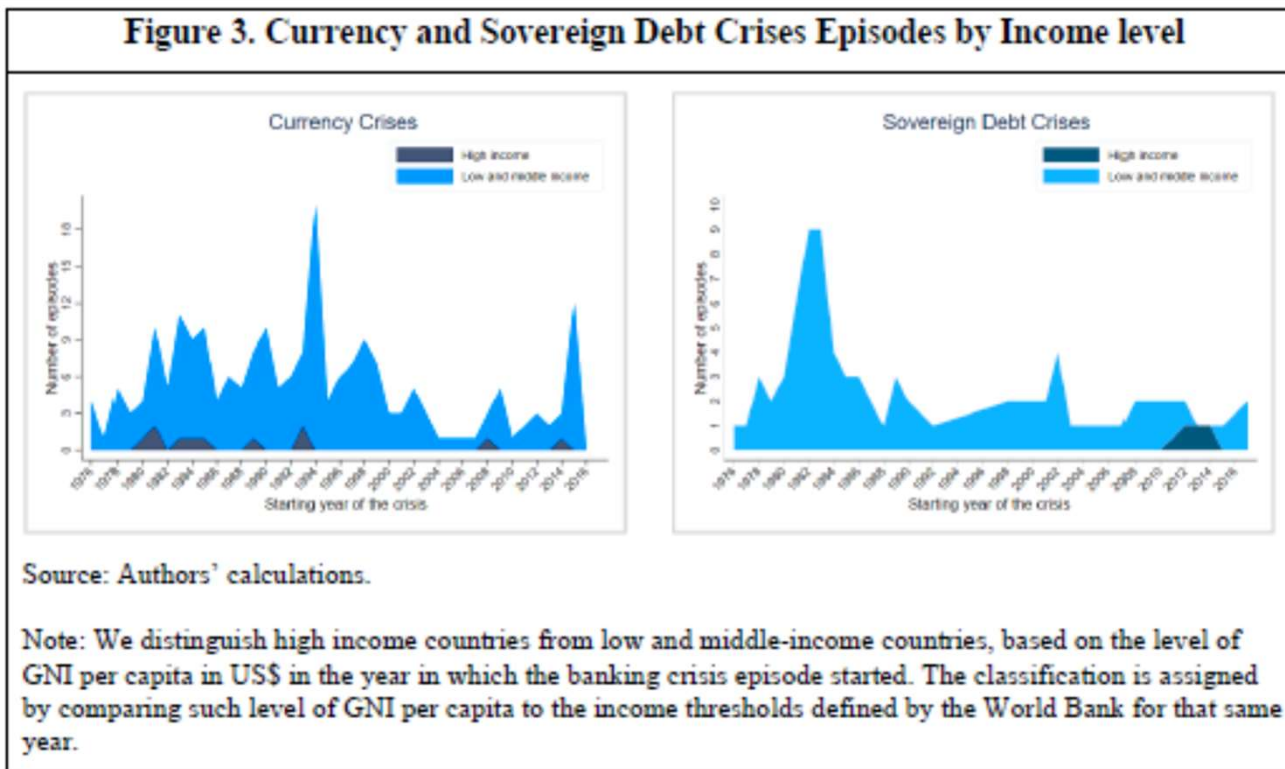
- **Banking and Currency crises:**

- (i) In the 1970's, when financial systems were highly regulated in many countries, currency crises were not accompanied by banking crises.
- (ii) However, **after the financial liberalization in the 1980's, currency crises and banking crises became intertwined.**
- (iii) According to Laeven and Valencia (2018), “**currency crises are a rare phenomenon among high-income countries**, including during the global financial crisis, in part due to the reserve currency status of some of these economies”.

Twin Crises

(iv) “sovereign debt and currency crises tend to coincide or follow banking crises”.

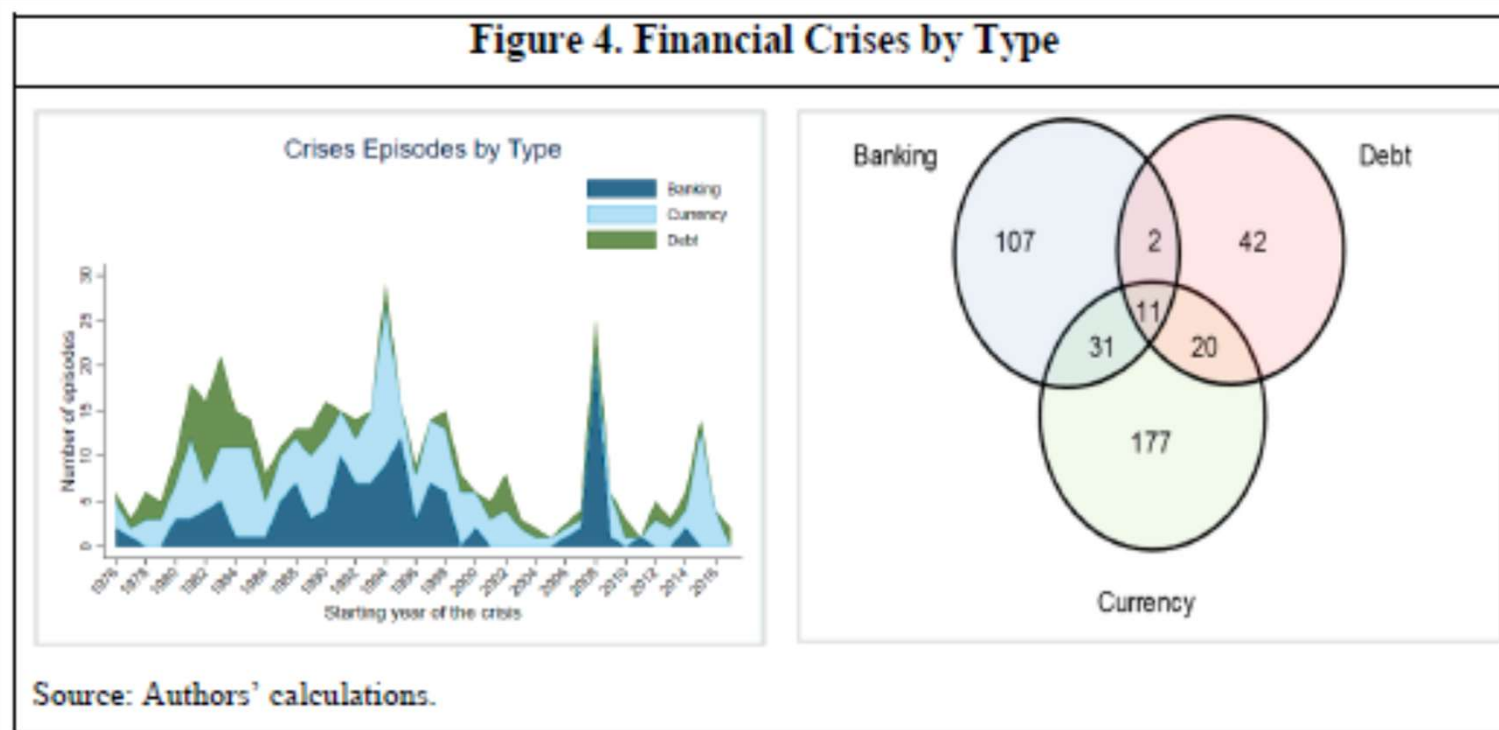
Figure 3. Currency and Sovereign Debt Crises Episodes by Income level



Laeven, Luc and Fabian Valencia (2018), “Systemic Banking Crises Revisited”, IMF WP/18/206.

Twin Crises

- Among the crises occurred since the 70's, **the subprime crisis was the most severe banking, currency and debt crisis simultaneously.**

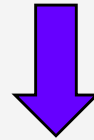


Laeven, Luc and Fabian Valencia (2018), "Systemic Banking Crises Revisited", IMF WP/18/206.

Twin Crises

- **Asian crisis (end of 90's):**

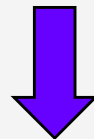
- (i) **much higher resolution costs** - between 40% and 50% of annual GDP ((e.g. in Indonesia and Thailand)



- (ii) **much larger NPLs** - between 45% and 75%.

- **Nordic crisis (early 90's):**

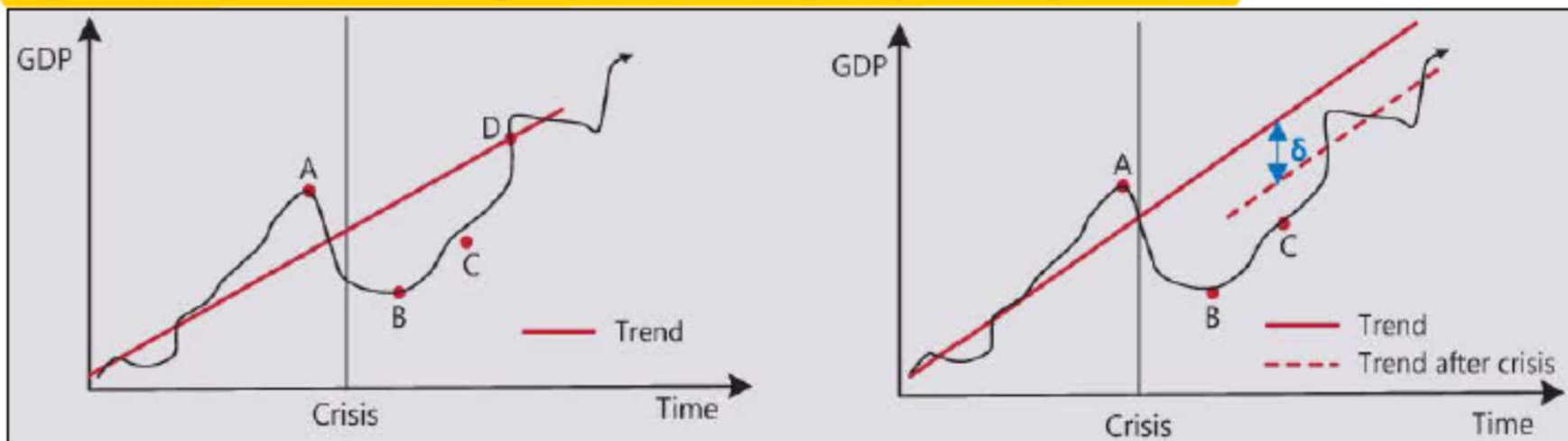
- **cumulative fiscal costs \leq 10% of annual GDP**, notwithstanding widespread bank failures.



Macro impacts

- Historically, financial crisis => **severe and protracted output losses.**

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

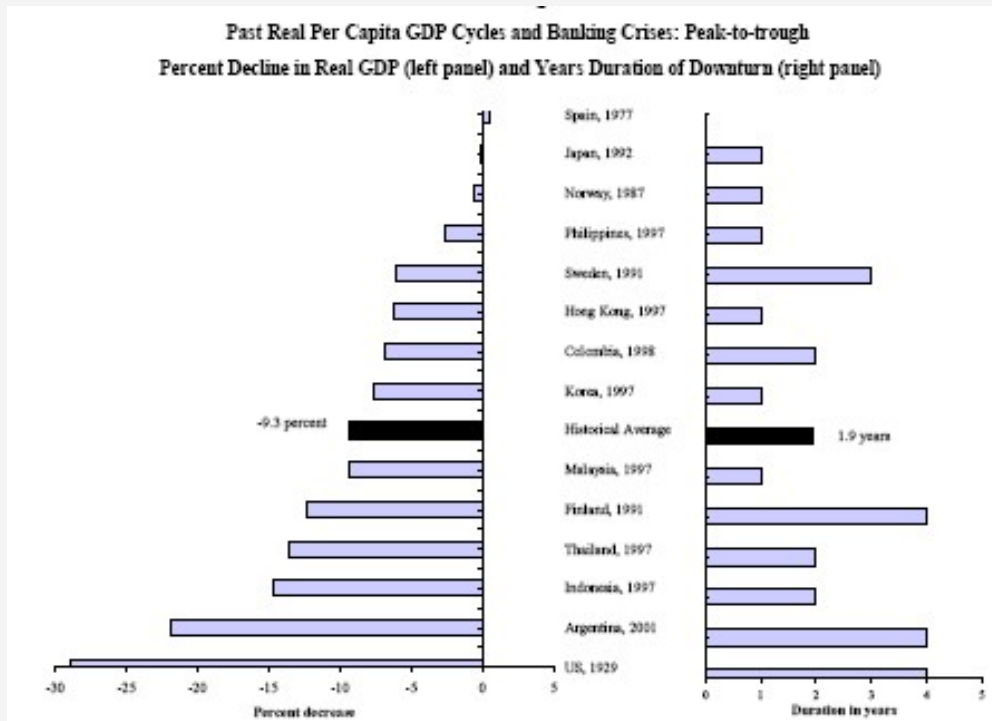


Note: Point A: pre-crisis peak. Point B: post-crisis trough. Point C: GDP growth equals trend GDP growth for the first time following the crisis. Point D: the level of GDP returns to the pre-crisis level.

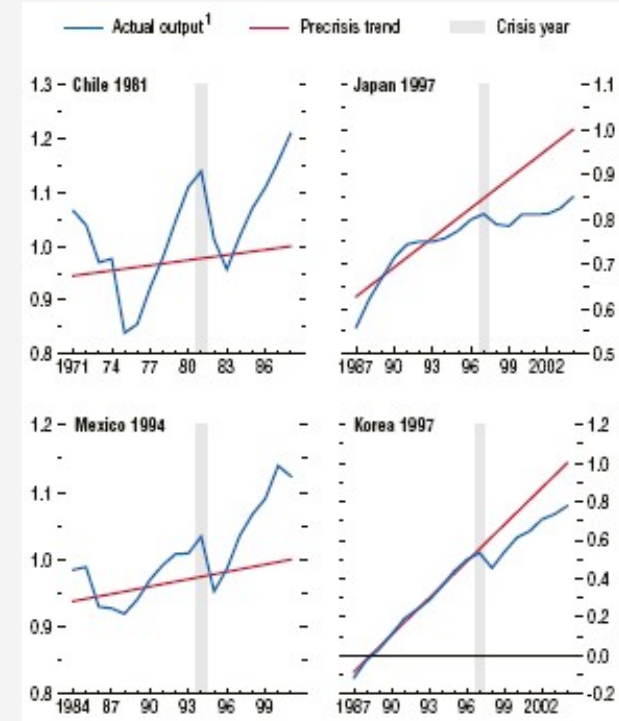
Source: ESRB (2017), "Resolving Non Performing Loans in Europe".

Macro impacts

- According to Reinhart et al. (2012), banking crises are associated with **lower growth - around -10% on average** (-6% according to Romer and Romer (2017)).



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".

Macro impacts

- Allen and Gale (2004) reached an even higher estimate for output loss – **around 17%** - from the assessment of 43 banking crisis between 1977 and 1998:

OUTPUT LOSSES ASSOCIATED WITH BANKING CRISES, 1977-98

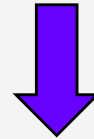
	Number of crises	Average crisis length (years)	Average cumulative output losses (percentage of GDP)
All	43	3.7	16.9
Single banking crises	23	3.3	5.6
Twin banking and currency crises	20	4.2	29.9
Developed countries	13	4.6	23.8
Emerging market countries	30	3.3	13.9

Source: Allen, Franklin and Douglas Gale (2003), "Competition and Financial Stability", Journal of Money, Credit and Banking, Vol.36, No.3 (June 2004, Part2)

- **Similar results were obtained in Hoggarth et al. (2001)**, where cumulative output losses (relative to trend) incurred in a sample of 47 banking crises were estimated, on average, **between 15%-20% of annual GDP**.

Macro impacts

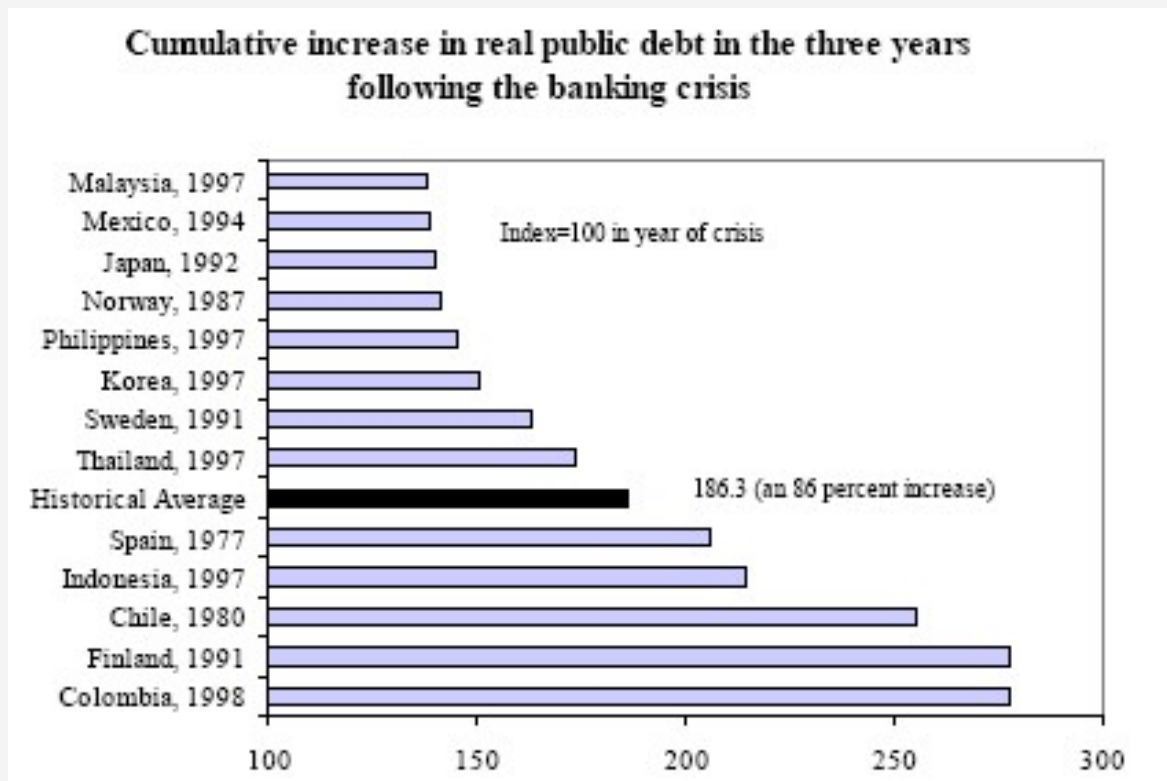
- Fiscal costs typically larger in countries with higher bank intermediation (credit/GDP).



- 1980's S&L crisis in the US in the 1980s - fiscal costs were estimated at only 3% of annual GDP, as intermediation by financial institutions is relatively low by the standards of developed countries.
- **Crises have also typically lasted longer in developed countries than in emerging markets** (5,5 vs 3,7 years), due to the higher bank intermediation.
- **Fiscal costs of banking crisis also depend on how crises are overcome** (see Dziobek and Pazarbasioglu (1997)) - **bad or protracted solutions => longer and more severe crises.**

Macro impacts

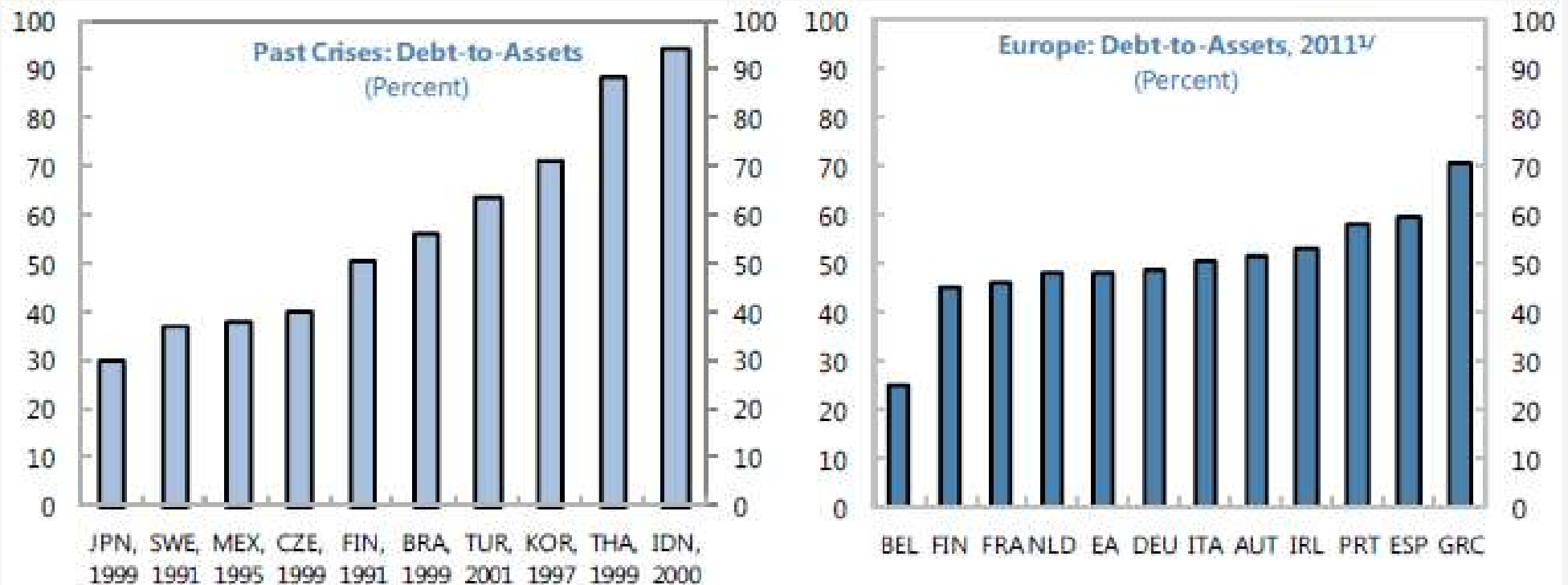
- Therefore, financial crises impact very significantly on **public debt - almost 2x.**



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

Macro impacts

- The upward behavior of total debt in the subprime crisis was in line with previous financial crises.



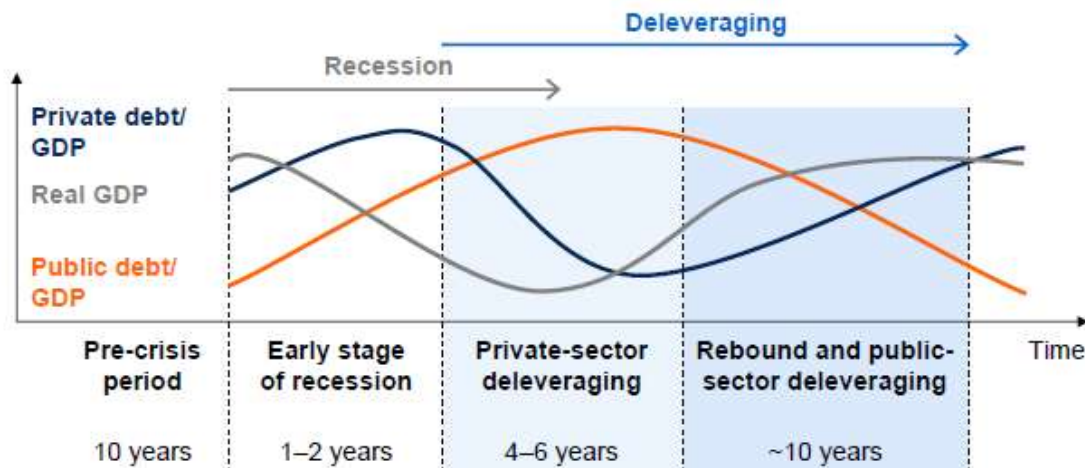
Source: IMF (2013), "Macro-Financial Implications of Corporate (De)Leveraging in the Euro Area Periphery, WP 13/154.

Macro impacts

- Typically, **deleveraging processes after financial crises are long, around 10 years**, 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



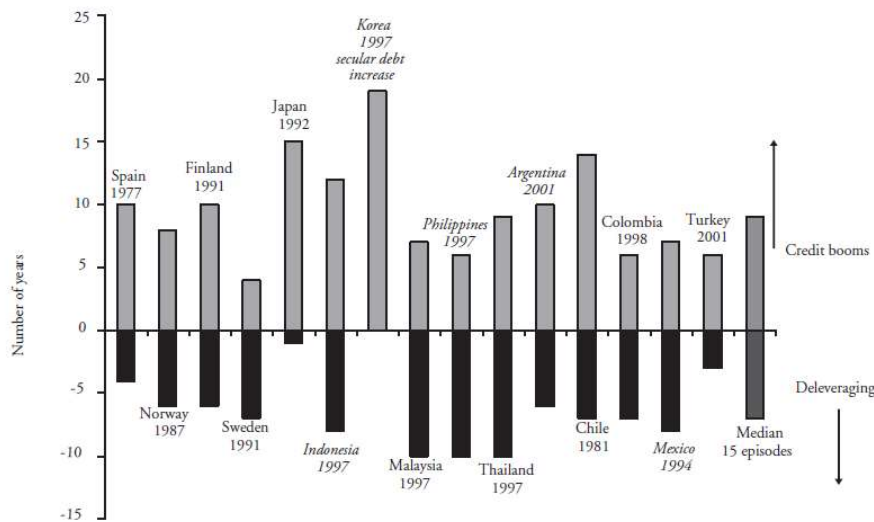
	Pre-crisis period	Early stage of recession	Private-sector deleveraging	Rebound and public-sector deleveraging
	10 years	1–2 years	4–6 years	~10 years
Real GDP growth Annual average (%)	3%	-3%	1%	3%
Change in debt/GDP Percentage points				
▪ Private sector	60	8	-26	87
▪ Public sector	3	15	21	-30

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

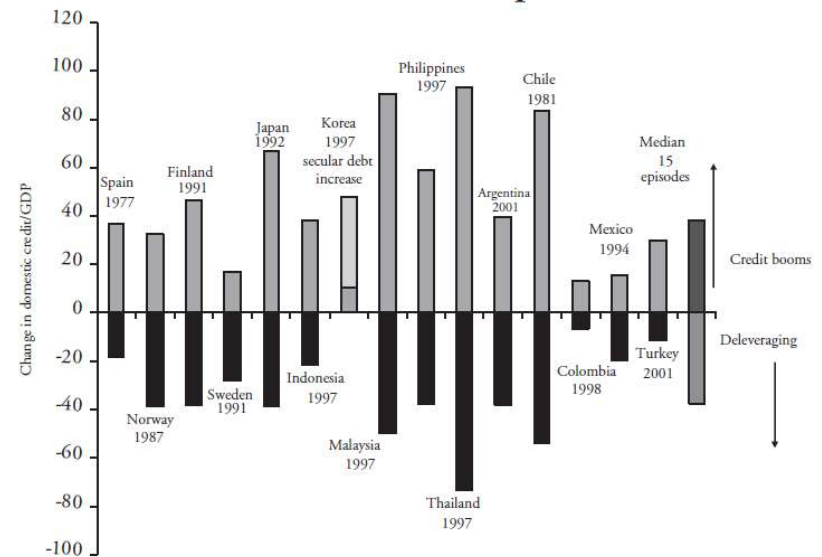
Macro impacts

- ... and involving **severe decreases in bank credit**, after huge credit increases – **Boom and Bust.**

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



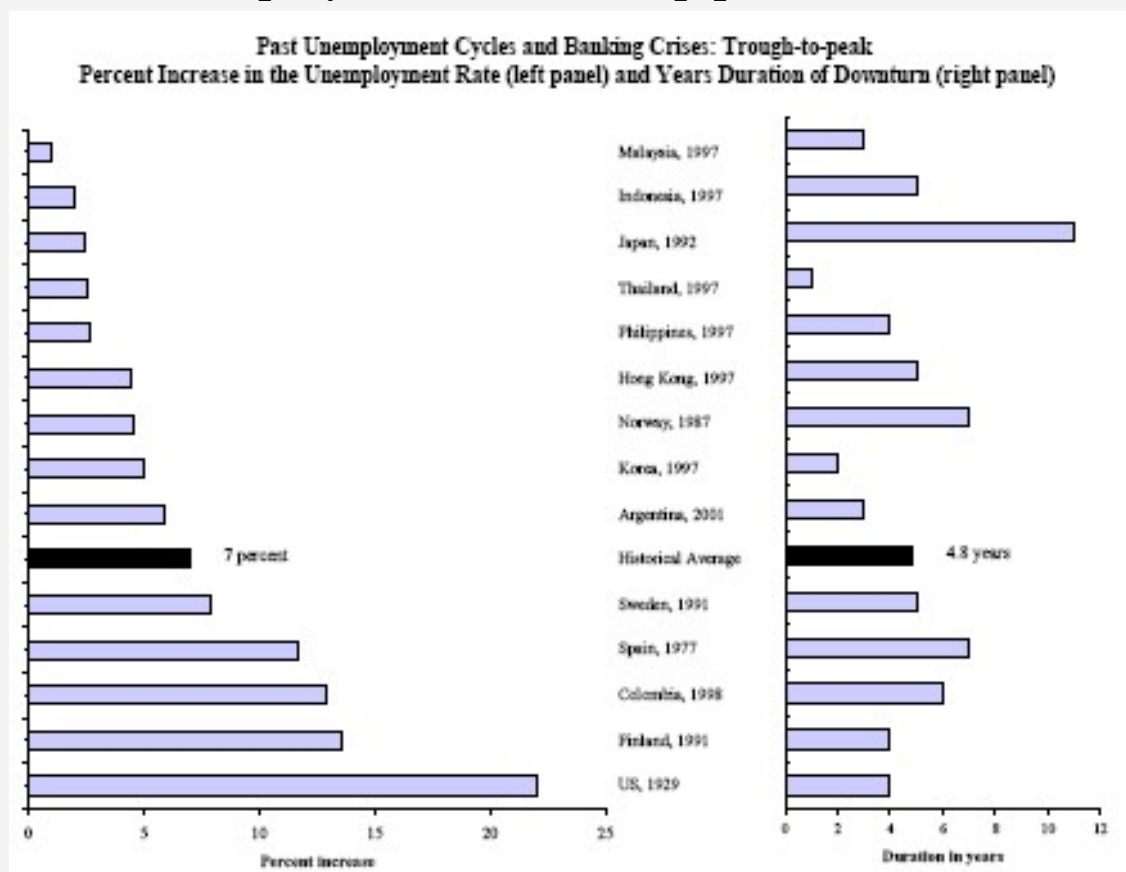
Domestic Banking Credit/GDP 21 Years Around Severe Financial Crises: Amplitude of Boom-Bust Credit Cycles in 15 Post-World War II Episodes



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

Macro impacts

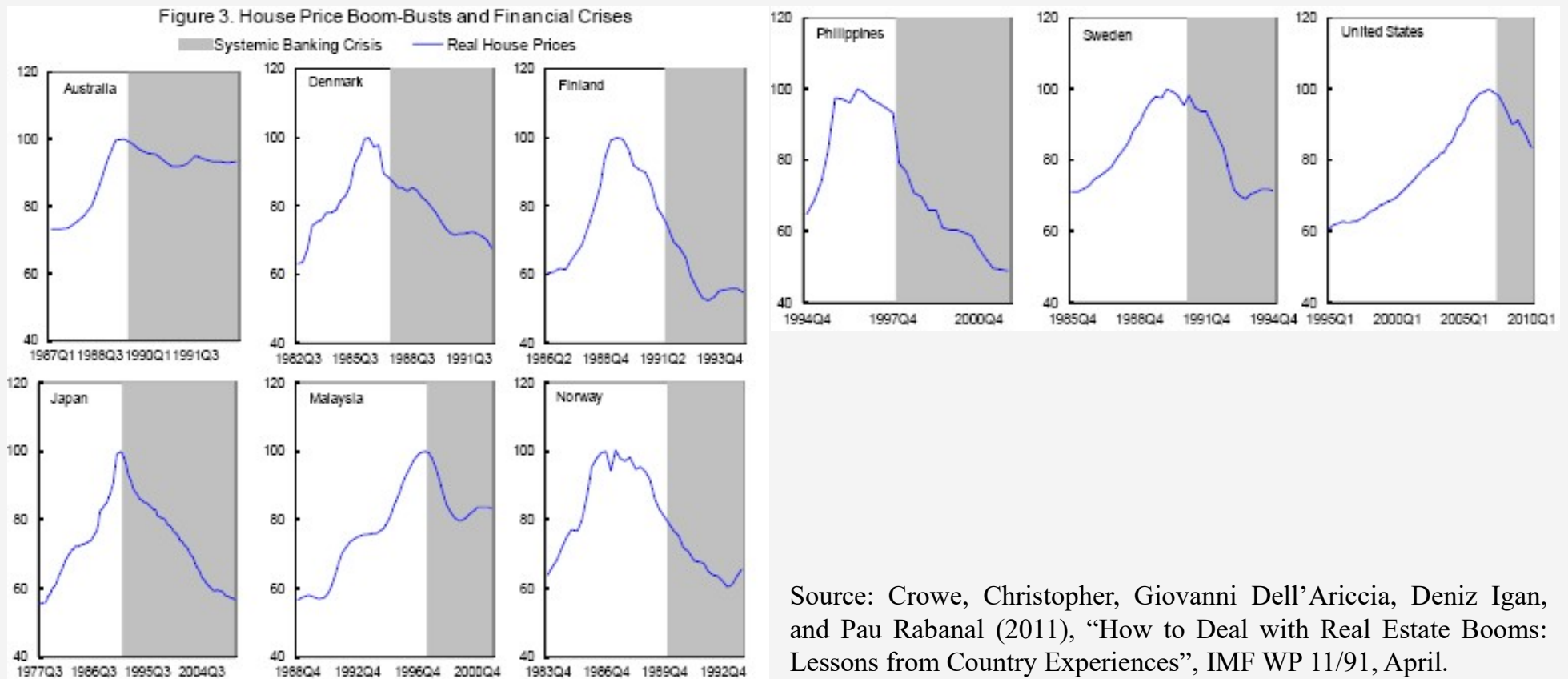
- Financial crises also impact very significantly on **unemployment**, with average increases in unemployment rates of 7 p.p., with these increases lasting around 5 years.



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

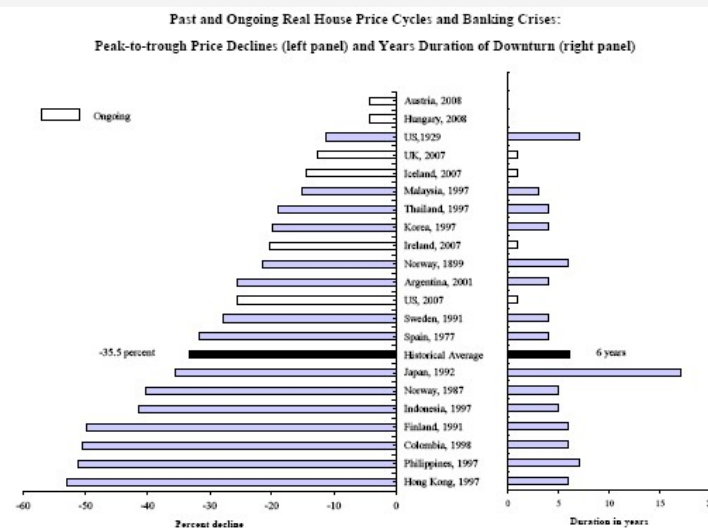
Markets

- Several previous financial crisis were triggered by bubbles in the real estate market, that led to severe price falls afterwards, e.g. Japan and the Nordic countries:



Markets

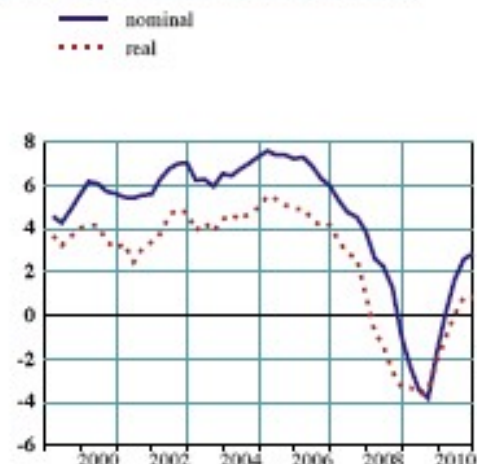
- On average, real estate prices fell by roughly 35% after financial crises, for a period of 6 years.



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

Chart S67 Residential property price changes in the euro area

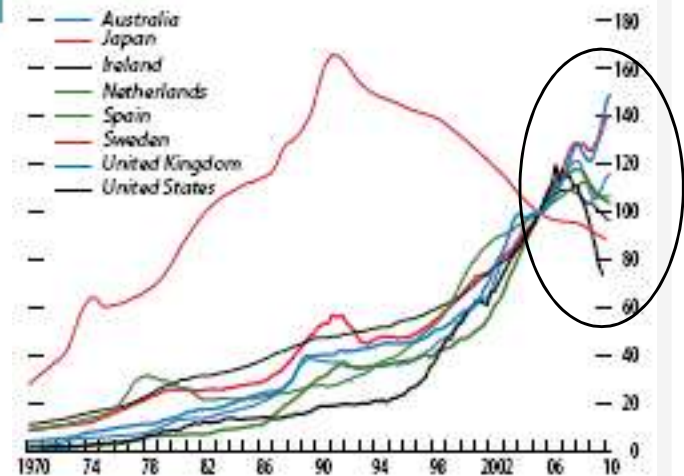
(Q1 1999 - Q4 2010; percentage change per annum)



Sources: Eurostat and ECB calculations based on national sources.
Note: The real price series has been deflated by the Harmonised Index of Consumer Prices (HICP).

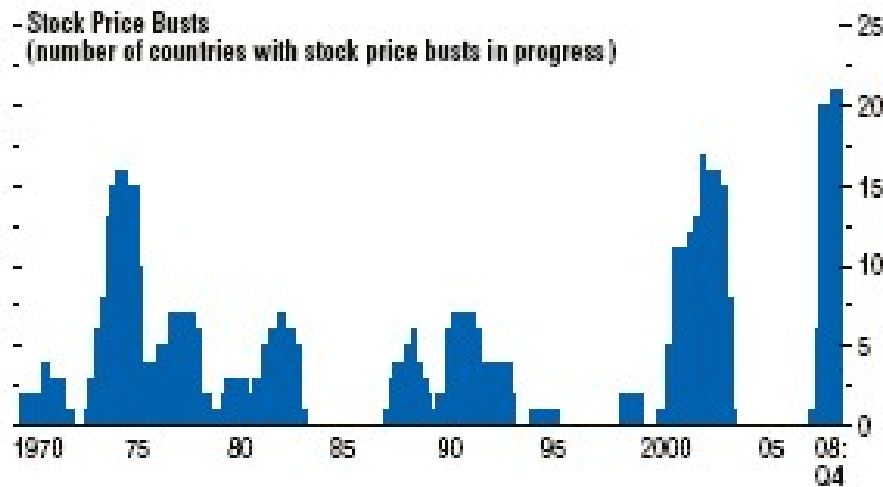
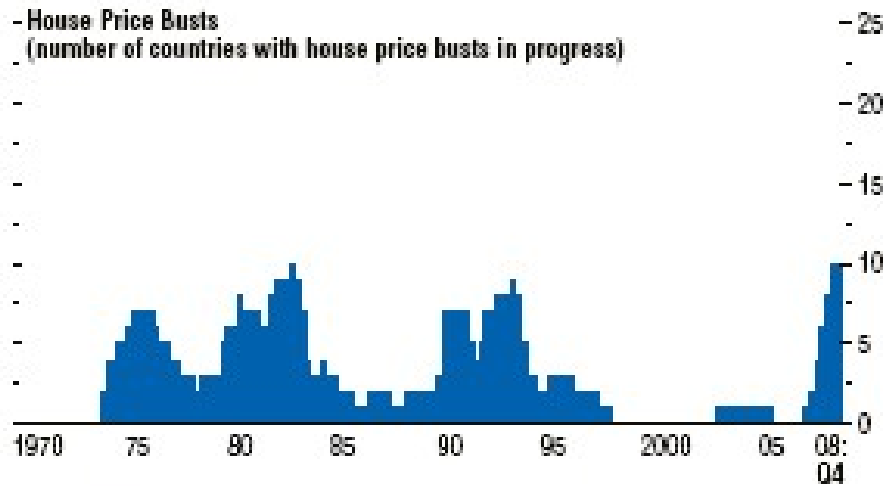
Source: European Central Bank (2011), "Financial Stability Review", June.

Figure 3.1. House Price Indices (2005 = 100)



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

Markets

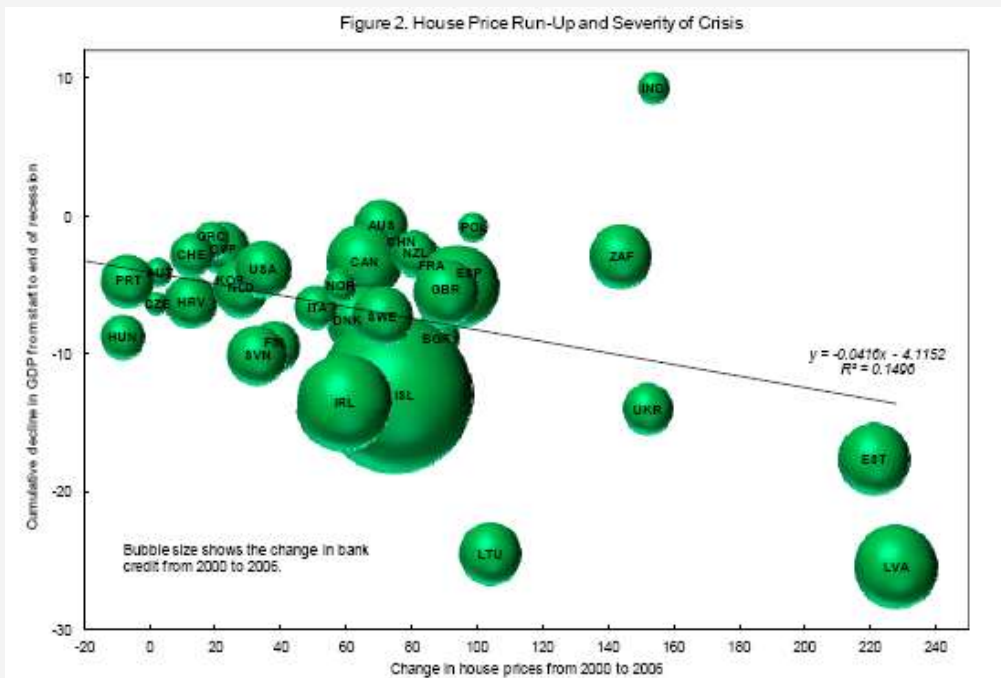


- Some of the previous financial crises, as well as the subprime crisis, were even triggered by **simultaneous bubbles in the real estate and in the equity markets.**

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

Markets

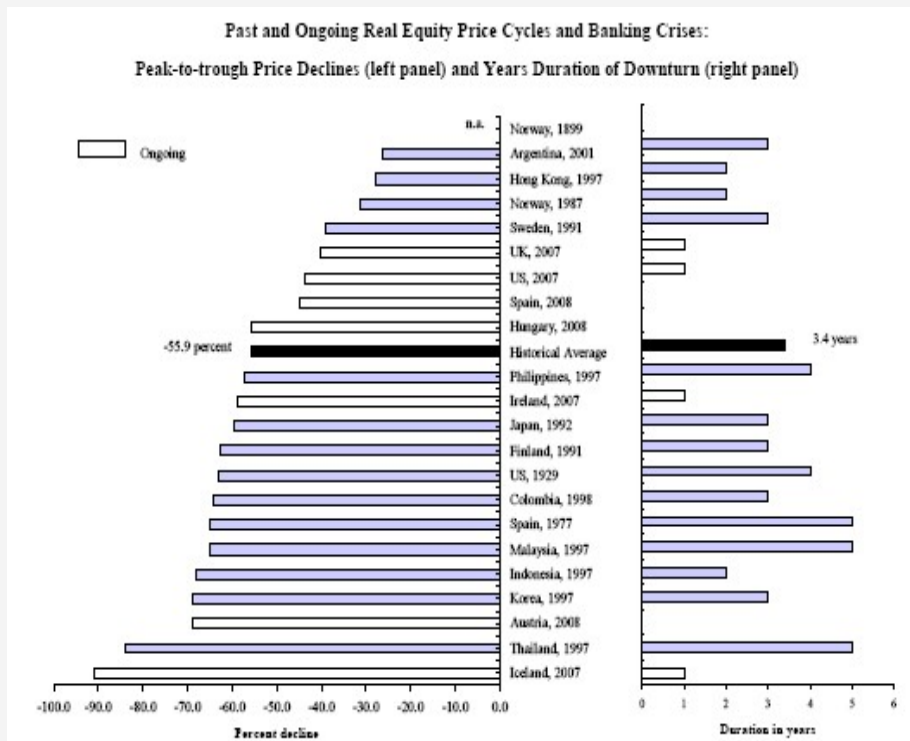
- Bubbles in real estate are usually fed by **excessive credit growth**, increasing the impact of the financial crisis.
- In the subprime crisis, **larger declines in GDP occurred in countries with larger house price increases before**, with many of these also having observed larger credit growth.



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.

Markets

- Historically, banking crises also impact very severely on equity prices (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..

Markets

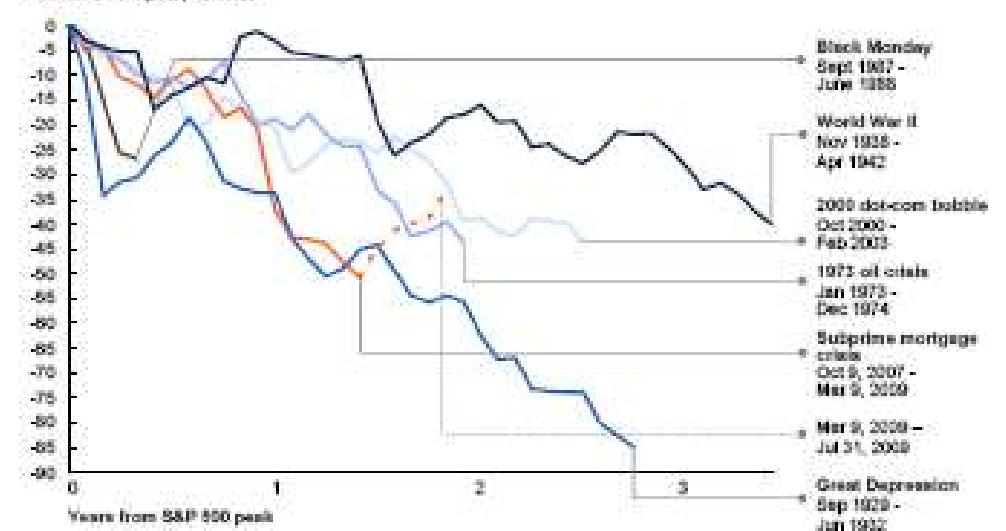
- The **impact of the subprime crisis on US stock prices** during its initial year **was similar to the one in the Great Depression**, but its peak-to-through variation reached only **-56%**, in line with the historical average and substantially less severe than in 1929 (-85%).



Source: Reuters

The 2008 stock market crash was the most severe since the Great Depression

S&P 500 crashes
% decline from peak, nominal



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

2.4. Policy Reactions

Summary

■ **Historical context - Main types of public intervention measures:**

(i) Financial sector measures

- Liquidity
- Capital

(ii) Macroeconomic policies

- Fiscal
- Monetary

■ **Public intervention measures in the subprime crisis:**

(i) Financial aid programs – Capital and Liquidity

(ii) Monetary policy

(iii) Regulation

Liquidity

■ Main features of liquidity measures reacting to banking crises (Laeven and Valencia (2018):

- (i) banking crises are initially tackled by **liquidity support to banks**.
 - “During the early stages of banking crises, and often in combination with liquidity support, governments have also **resorted to limited or full guarantees on some or most bank liabilities**, to help stem bank runs and alleviate liquidity pressures on these entities. They typically buy policymakers time to develop more comprehensive resolution and restructuring plans”.
 - “In cases where liquidity pressures have been significant, countries have in some cases resorted to **administrative measures, suspending the convertibility of deposits into cash** and restricting foreign payments. These “deposit freezes” have often been preceded by bank holidays—the temporary closure of banks”.

Liquidity

(ii) **After liquidity support, measures on capital are usually necessary:**

- recapitalization of viable institutions;
- resolution of insolvent ones;
- outright nationalization.

■ **Deterioration in banks' capital position after liquidity drains due to:**

- (i) fire sale prices to meet liquidity needs;
- (ii) deterioration in asset quality as a consequence of increasing NPLs.

Capital

- **Bail-outs have been an important tool** to provide support to banks until the subprime crisis.
- According to Calomiris and Haber (2014), **this happened since the mid-XIX century:**
 - “taxpayer-funded bail-outs of banks are a recent phenomenon. Until the mid-twentieth century, the costs of failure tended to be borne by the bankers themselves, along with bank shareholders and depositors. Since then, however, the costs have been progressively shifted to taxpayers”.
- **This is especially surprising as according to the literature public bail-outs tend to produce much larger losses and deeper recessions.**

Macroeconomic policies

- High-income countries have more room to react to financial crises, via fiscal and monetary policies, employing a **wider range of instruments**.

Figure 7. Short-term Interest Rates and Fiscal Balances around Banking Crises

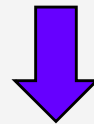


Source: World Economic Outlook, IMF, IFS, and authors' calculations.

Laeven, Luc and Fabian Valencia (2018), "Systemic Banking Crises Revisited", IMF WP/18/206.

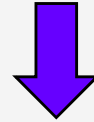
Public intervention measures in the subprime crisis

- **Policymakers took some time to understand the origins of the financial system's latent instability and the crisis was initially tackled as a cyclical event**, that had to be targeted with focused and temporary measures.



- Reactions started mostly after the Lehman failure and learning from the lessons of 1929 crisis, **the initial intervention of prudential authorities, central banks and Governments, under international coordination, was focused on:**
 - Massive liquidity provision by central banks, reducing short-term interest rates to 0;
 - Takeovers/bailouts;
 - Financial operations, including purchases of toxic assets, funding guarantees and capital injections;
 - Fiscal stimulus;
 - Regulation.

Public intervention measures in the subprime crisis



- Reactions started mostly after the Lehman failure and learning from the lessons of 1929 crisis, **the initial intervention of prudential authorities, central banks and Governments, under international coordination, was focused on:**
 - Massive liquidity provision by central banks, reducing short-term interest rates to close to or even below zero;
 - Takeovers/bailouts;
 - Financial operations, including purchases of toxic assets, funding guarantees and capital injections;
 - Fiscal stimulus;
 - Regulation.

Public intervention measures in the subprime crisis

- The stages of public interventions during the subprime crisis are well synthesized by Martin Wolf: “Why so little has changed since the financial crash”, 4 Sept. 2018, Financial Times:

“**The chief aim of post-crisis policymaking was rescue: stabilise the financial system and restore demand. This was delivered by putting sovereign balance sheets behind the collapsing financial system, cutting interest rates, allowing fiscal deficits to soar in the short run while limiting discretionary fiscal expansion, and introducing complex new financial regulations. This prevented economic collapse, unlike in the 1930s, and brought a (weak) recovery**”.

“**Shortly after the worst of the crisis had passed, fiscal policy turned towards austerity.** The financial system is much as before, albeit with somewhat lower leverage, higher liquidity requirements and tighter regulation”.

- **Government support packages were very diversified**, including liquidity and capital injections, debt guarantees, deposit insurance and asset purchase.

Financial aid programs

- **Before the Lehman failure, some initial bail-outs occurred in EU:**
 - UK - takeover of Northern Rock in 2007 (after the 1st bank run in UK in 150 years, following an initial refusal by the Bank of England to provide liquidity to struggling banks in its jurisdiction, due to concerns about moral hazard).
- **In US, the most relevant bail-outs occurred after the Lehman failure:**
 - 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) - launched in Oct.2008 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 in Nov.2008, to restart the flow of funds in the consumer credit market.

Financial aid programs

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.08-Jan.09 – Additional isolated actions (e.g. Citigroup, Bank of America)
- (iv) Jan.-Abr.09 – New support packages (e.g. UK, US, Japan)
- (v) 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	285	
	DE	PRO	DG	EUR	400	
		PRO	CI&AP	EUR	80	
	IT	PRO	DG	EUR	Unspecified	
	ES	PRO	DG	EUR	100	
US	PRO	CI	EUR	Unspecified		
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	US	SAA	AP	USD	54	The Swiss government recapitalises USBS and the SNB sets up a vehicle to remove up to \$50 billion worth of illiquid assets from USBS's balance sheet, on which the bank will bear the first \$6 billion loss.
			CI	CHF	8	
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.

Financial aid programs

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 €35.8 billion (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).
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.

Financial aid programs

- According to Alessandri and Haldane (2009), **the Government support to banks in the UK, US and the euro-area during the crisis reached around 25% of GDP, dwarfing any previous state support of the banking system.**
- The subprime crisis, like 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.**

Financial aid programs

- The relevance of the support provided to the financial sector was much more significant among advanced economies, where it reached almost 50% of the GDP in early 2009.

Table 2.3. Financial Sector Support and Discretionary Fiscal Stimulus in Group of Twenty Economies
(Percent of GDP)

1. Headline Support for the Financial Sector (as of February 2009)

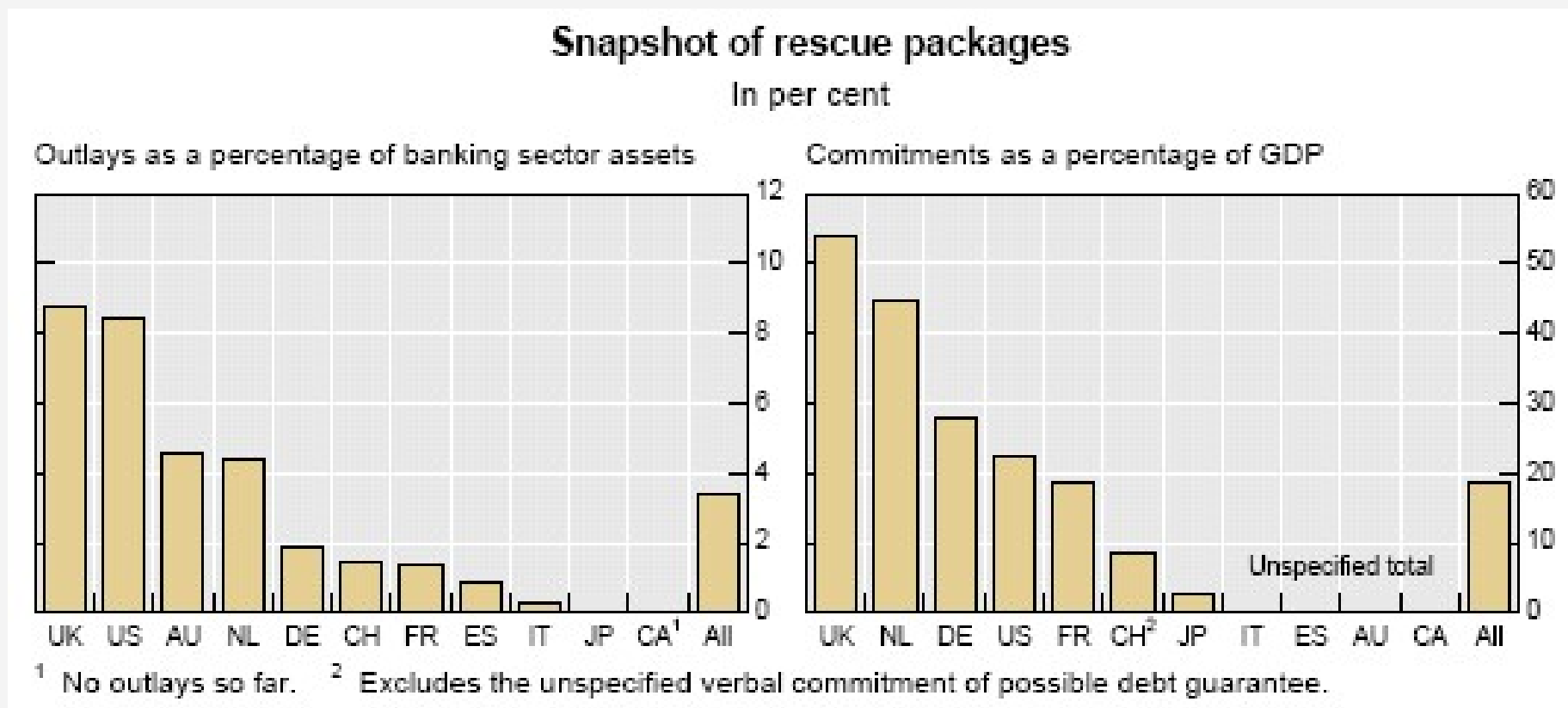
	Capital Injection	Purchase of Assets, Lending by Treasury	Central Bank Support with Treasury Backing	Central Bank Liquidity Support	Guarantees	Total
	(A)	(B)	(C)	(D)	(E)	(A+B+C+D+E)
G20 Average (PPP GDP-weighted)	2.0	3.3	1.0	9.2	14.3	29.8
Advanced Economies	2.9	5.0	1.2	12.9	21.3	43.3
Advanced Europe	2.4	3.6	2.1	1.0	19.5	28.6
Emerging Markets	0.3	0.1	0.3	1.8	0.2	2.7

2. Crisis-Related Discretionary Fiscal Stimulus in G20 Economies (as of October 2010)

	2009	2010	2011
G20 Average	2.1	2.1	1.1
Advanced Economies	1.9	2.1	1.2
Emerging Markets	2.4	2.0	0.9

Financial aid programs

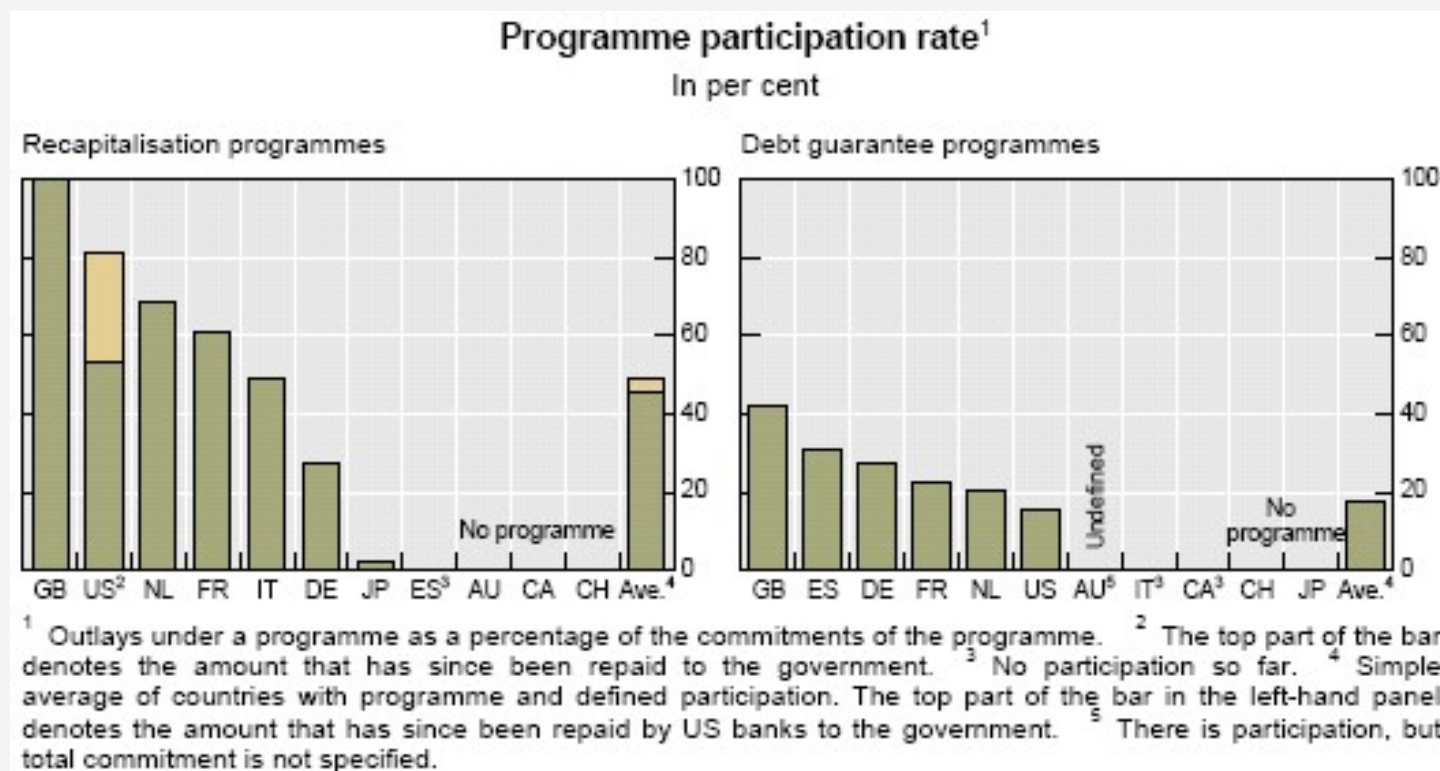
- As a percentage of the banking assets and GDP, **Government interventions assumed a higher weight in UK, with commitments over 50% of the GDP.**



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

Financial aid programs

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



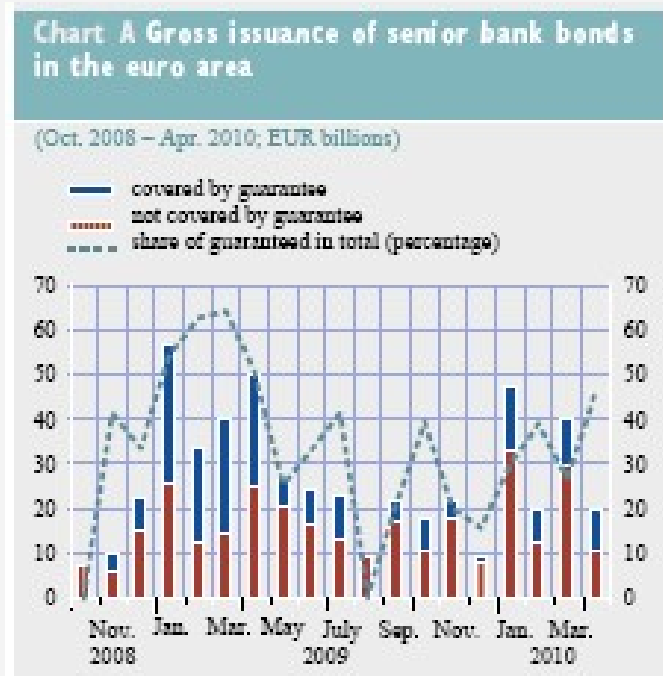
Source: BIS (2009), “An assessment of financial sector rescue programmes”, BIS Papers, No.48, July.

Financial aid programs

- 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 as % GDP
	Within schemes	Outside schemes	Guaranteed issuance of bonds	Other guarantees, loans	Within schemes	Outside schemes	
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

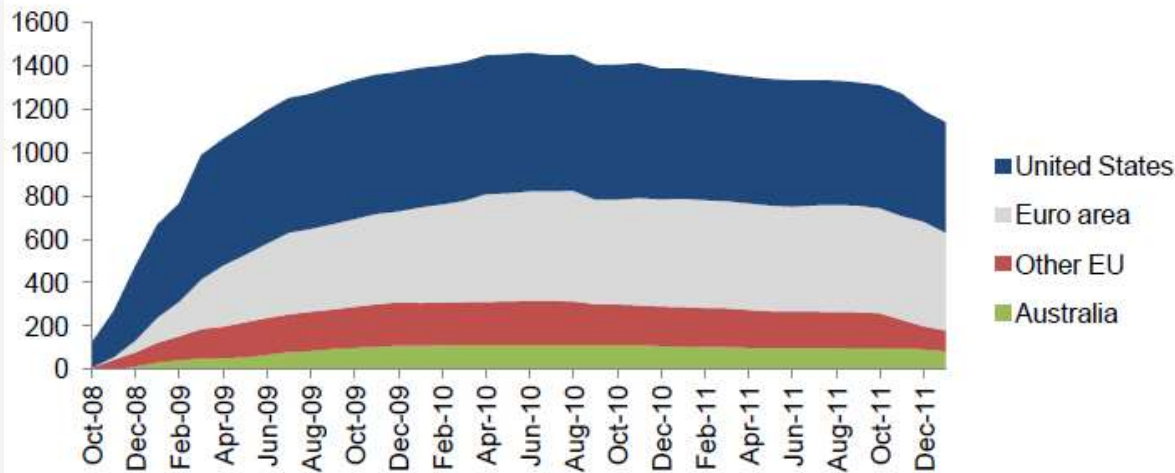


Source: European Central Bank (2009 and 2010), “Financial Stability Review 2008 and 2009”.

Financial aid programs

- The stock of outstanding government-guaranteed bonds reached around 1.4T€ in early 2010, half of this figure from the US.
- Fiscal costs of financial assistance also increased significantly until 2010.

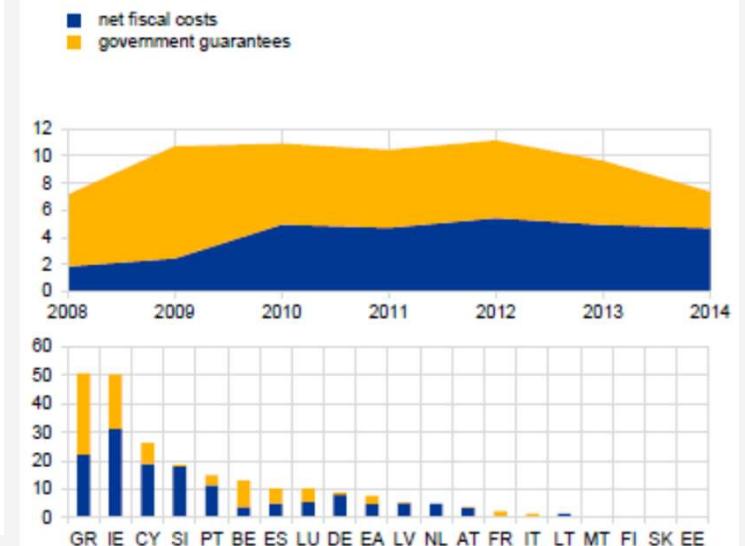
Figure 8. Outstanding Government-Guaranteed Bonds
(US\$ billions)



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

Net fiscal costs of financial assistance measures and outstanding government guarantees

(2008-2014; percentage of GDP)

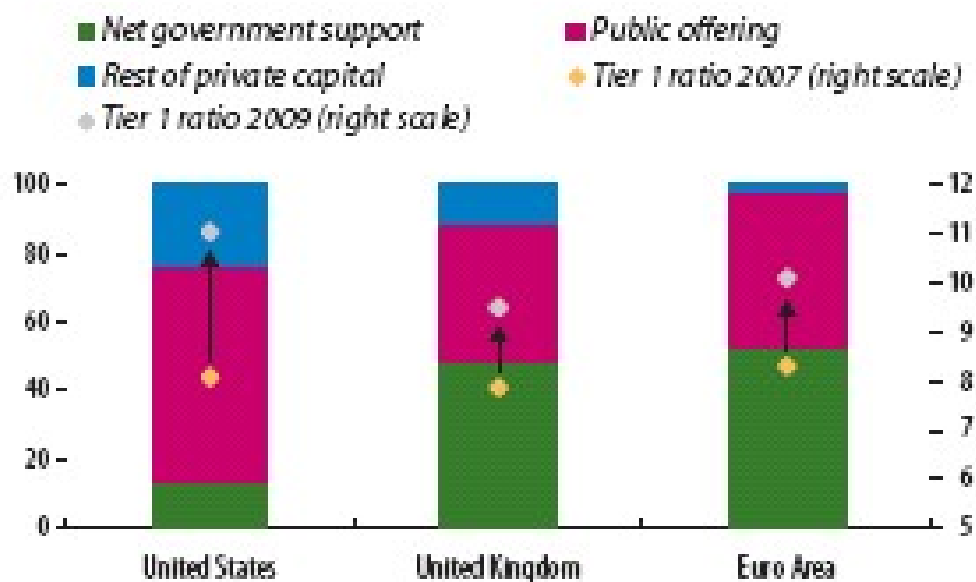


Source: ECB (2016), “ECB Financial Stability Review”, May.

Financial aid programs

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

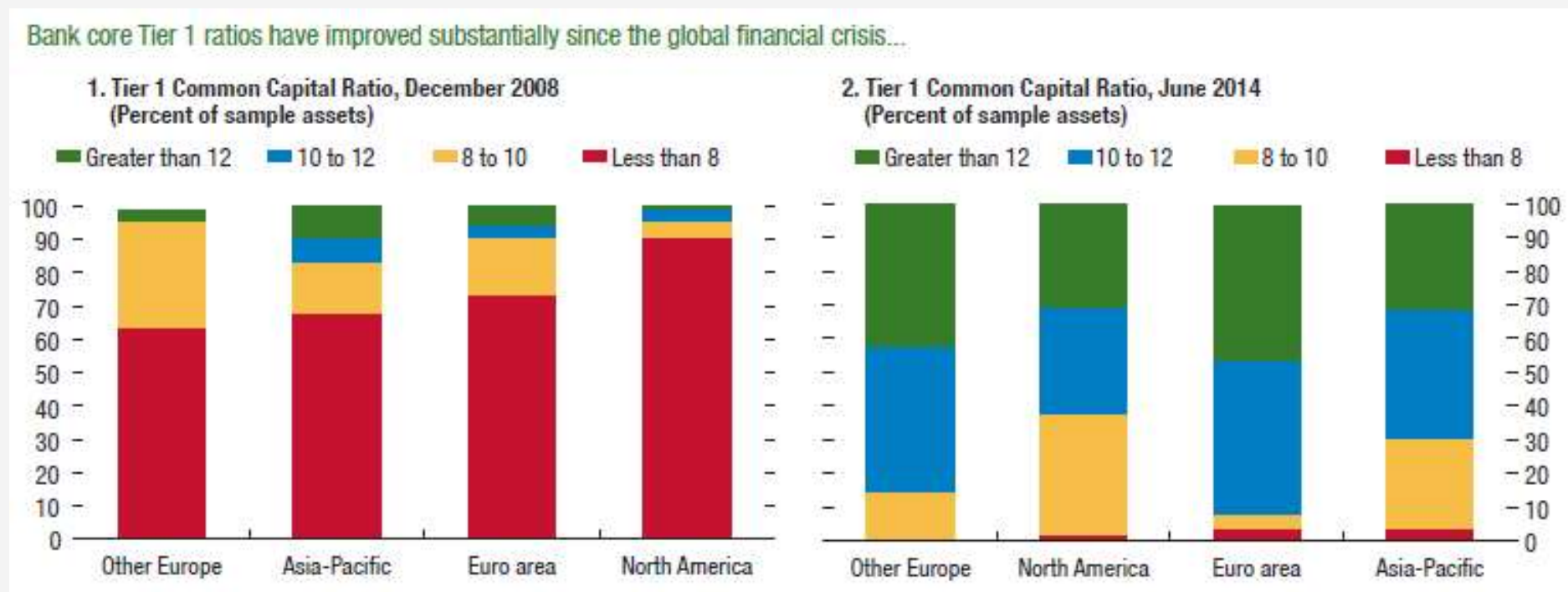
Figure 1.13. Capital Raised by Banks and Tier 1 Ratios
(In percent)



Source: IMF (2010).

Financial aid programs

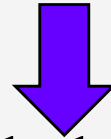
- As a consequence of these capital injections, **significant increases in capital ratios occurred in several jurisdictions**, with almost all banks exhibiting Tier 1 ratios $> 8\%$.



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

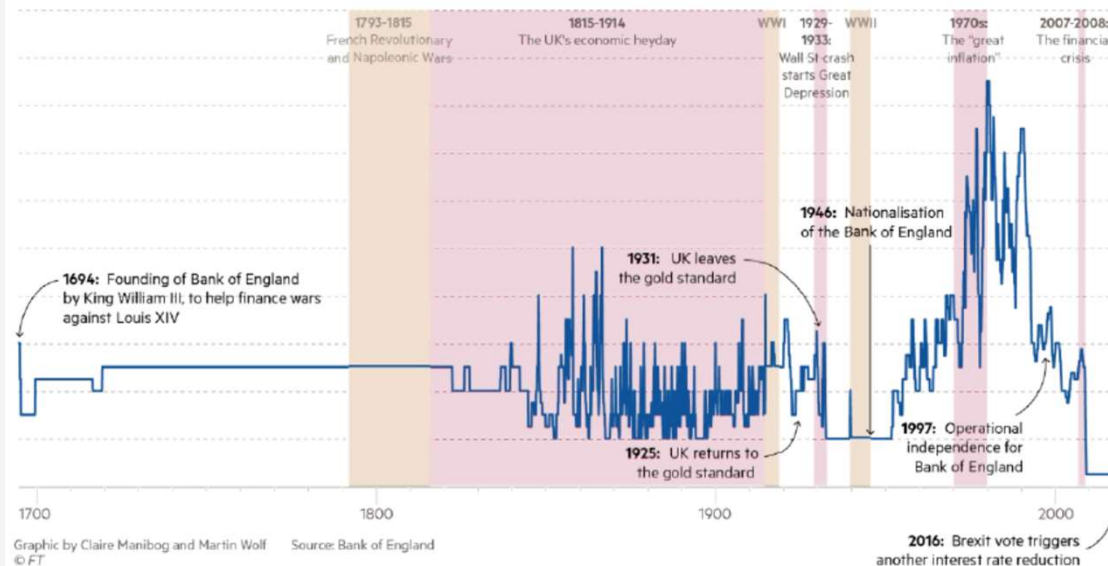
Monetary policy

- Short-term interest rates were cut much more substantially than in previous crises.
- For instance, until Jan2009, the BoE had never lowered its lending rate below 2%. Then it lowered to 1.5%, 0.5% in Mar2009 and 0.25% in Aug2016.



This time really is different

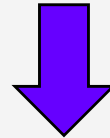
Bank of England official lending rate (%), 1694-2017



Source: Wolf, Martin (2018), "Nothing like this has happened in 323 years", 16 August, FT.

Regulation

- New regulations to mitigate the probability and impact of future crises was an afterthought, when Governments realized **that the problem required a much broader, longer-term structural solution.**



- **European-wide initiatives occurred only after the subprime crisis mutated into the Government debt crisis.**
- Worldwide initiatives were also developed, contributing to Basel III.

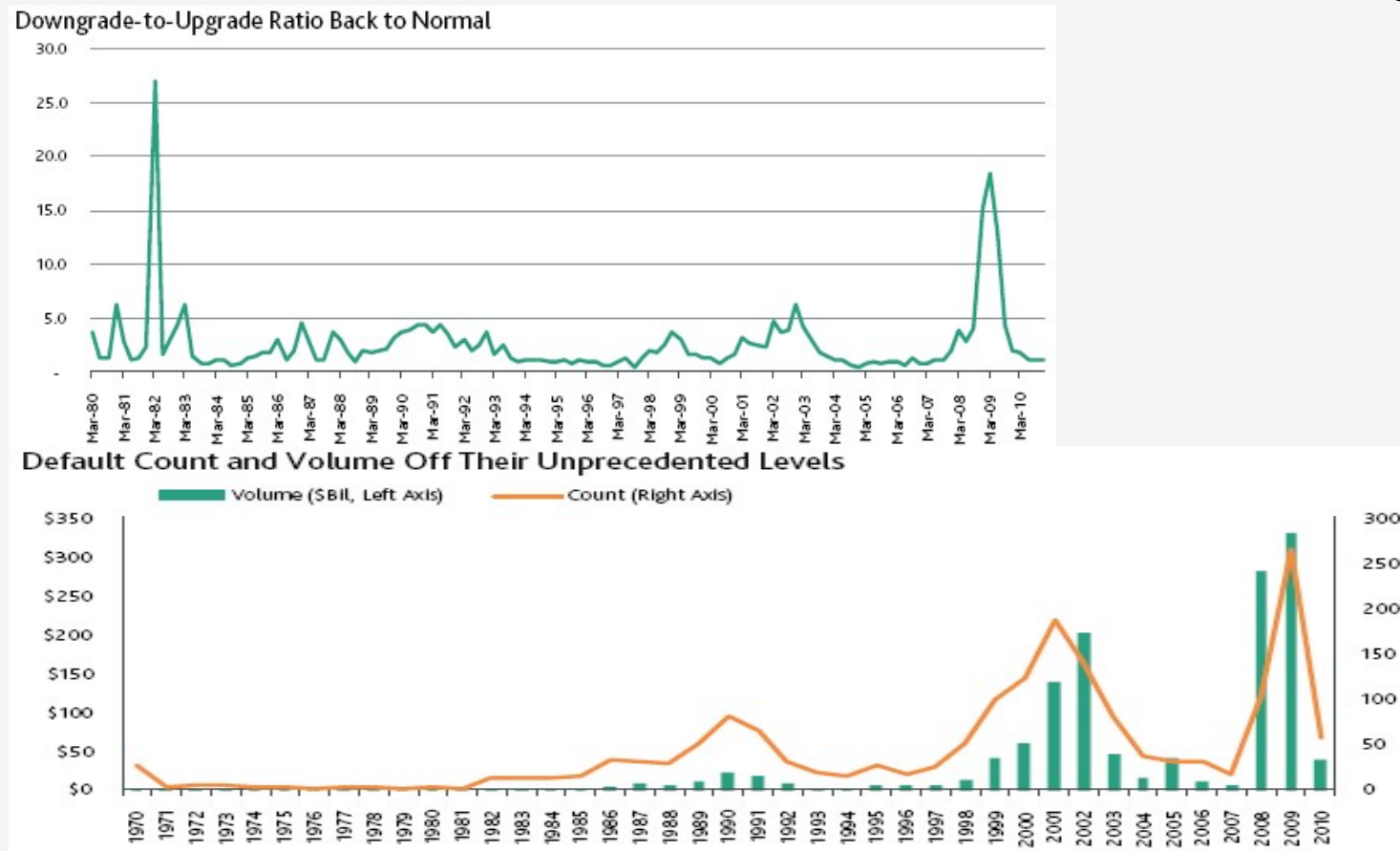
2.5. Aftermath

Summary

- Normalization
- Sovereign Debt Crisis
- Costs
- Regulation

Normalization

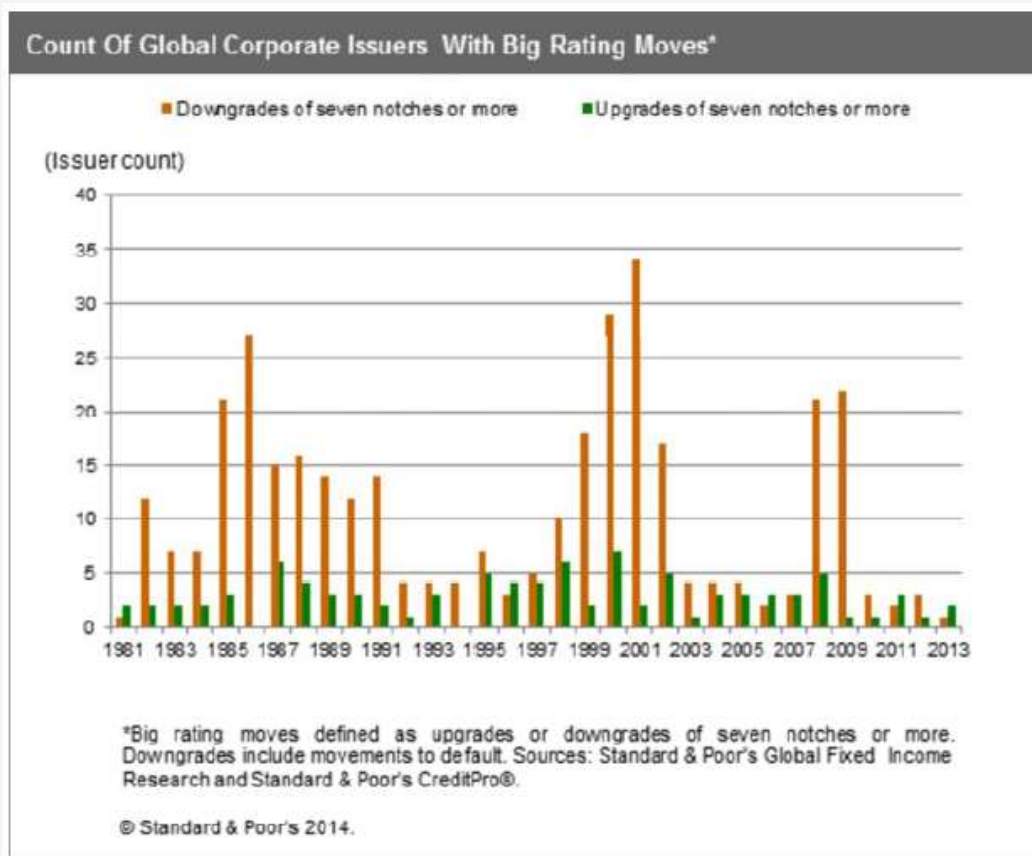
- In 2010 some normalization of market conditions was already observed, with the decrease in the number of defaults and downgrades ...



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

Normalization

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

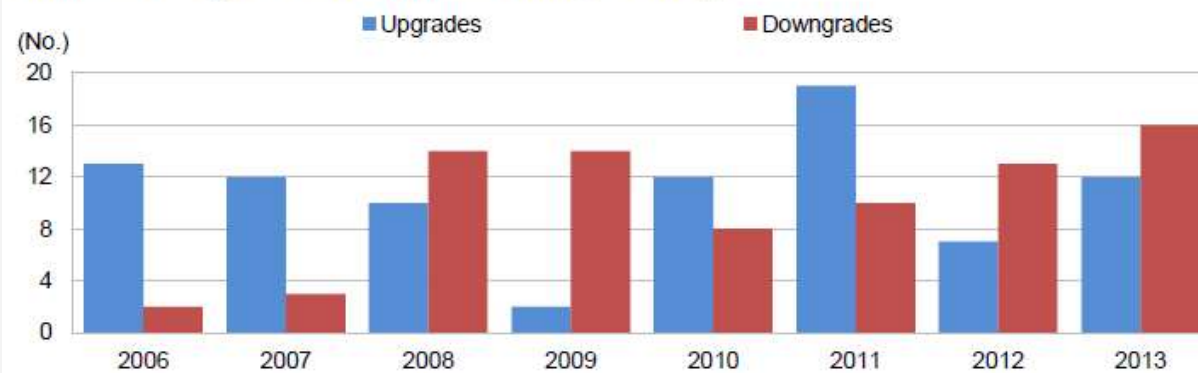


Source: S&P (2014), "Default, Transition and Recovery: 2013 Annual Global Corporate Default Study and Rating Transitions".

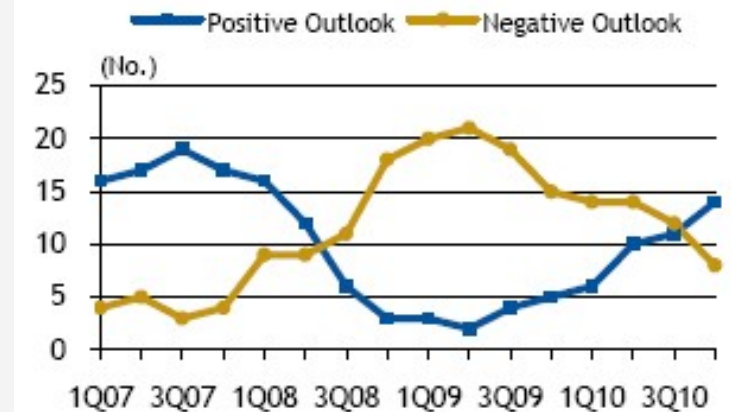
Normalization

- ... 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. ...

Fitch Sovereign IDR Historical Rating Activity^a



Share of Sovereign IDRs Positive and Negative Outlooks^a (2007–2010)



^aQuarter-end.

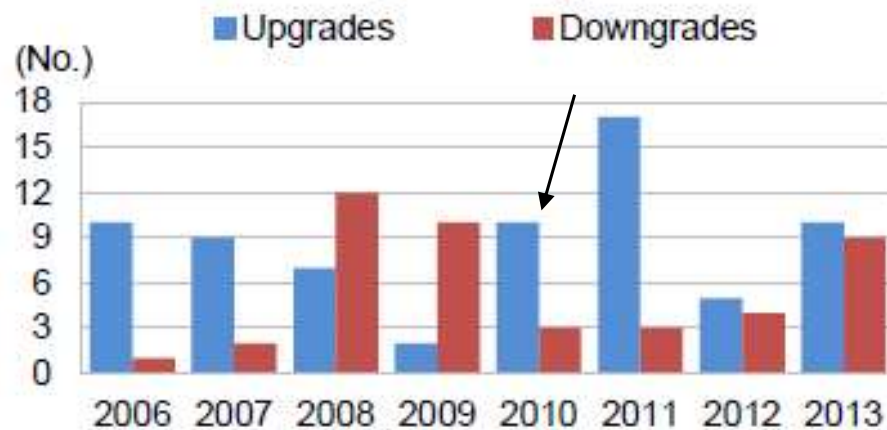
Source: Fitch Ratings (2014), “Fitch Ratings Sovereign 2014- Transition and Default Study”, 14 Mar.

Fitch Ratings (2011), “Fitch Ratings Sovereign 2010 - Transition and Default Study”, 23 Mar.

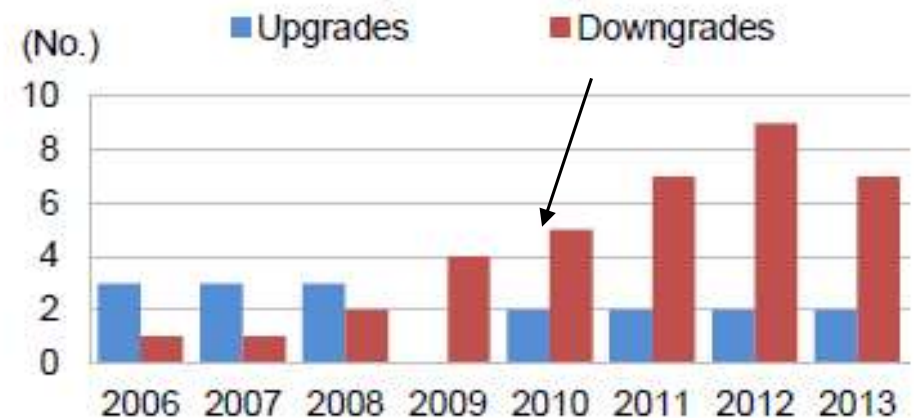
Normalization

- ... which essentially originated downgrades among developed economies.

**Fitch Emerging Market Sovereigns
Historical Rating Activity^a**



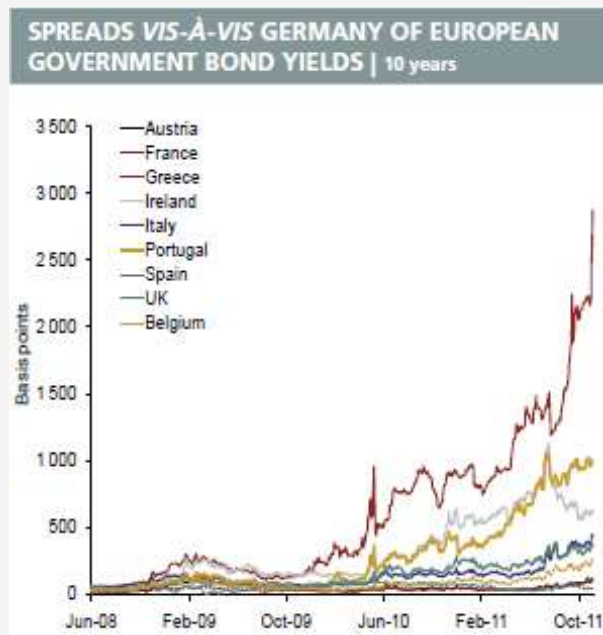
**Fitch Developed Market Sovereigns
Historical Rating Activity^a**



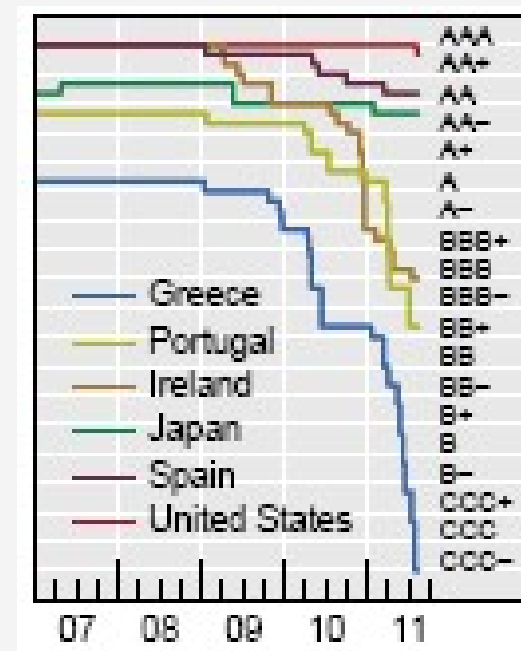
Source: Fitch Ratings (2014), "Fitch Ratings Sovereign 2014- Transition and Default Study", 14 Mar.

Sovereign debt crisis

- **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".

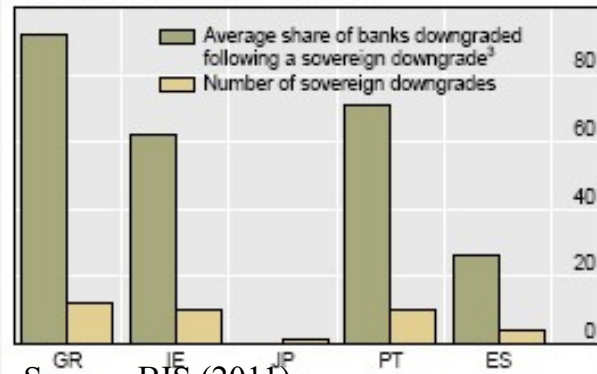


Source: BIS (2011).

Sovereign debt crisis

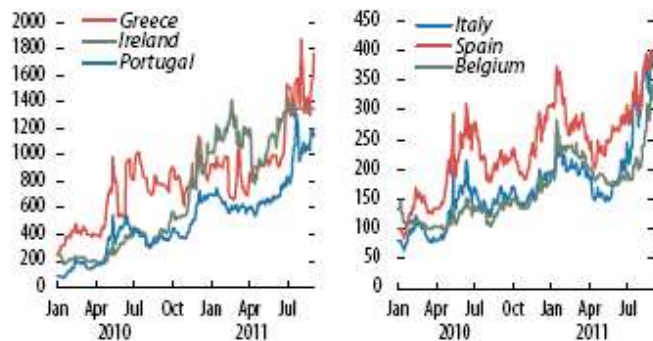
- Given the weight of sovereign debt in banks' balance sheets, **second order effects on banks' liquidity, profits and solvency were observed.**

Sovereign ratings downgrades since November 2009 and the effect on domestic banks²

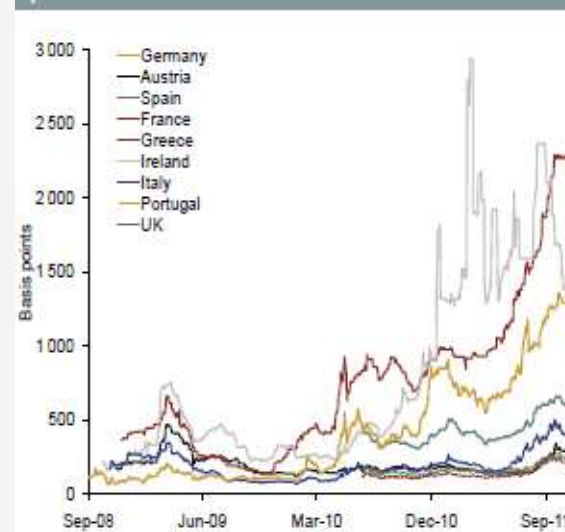


Source: BIS (2011).

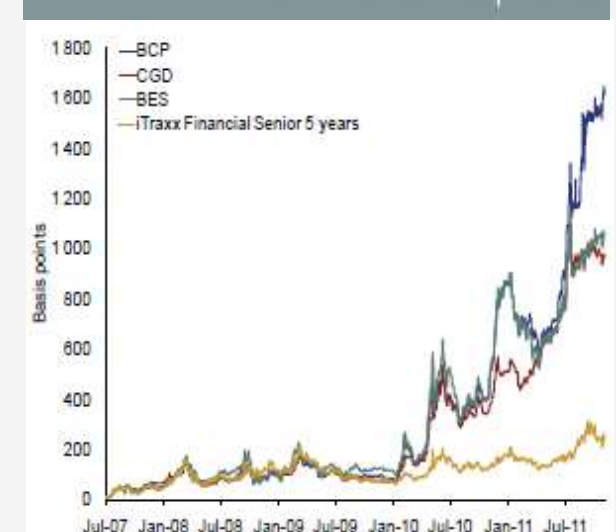
Figure 1.15. Spreads on Bank Five-Year Credit Default Swaps (In basis points)



CREDIT DEFAULT SWAPS OF EUROPEAN BANKS | 5 YEARS SENIOR



CREDIT DEFAULT SWAP SPREADS OF PORTUGUESE BANKS | 5 YEARS SENIOR

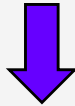


Source: Banco de Portugal (2011), "Financial Stability Report", Nov.

Source: IMF (2011).

Sovereign debt crisis

- Additionally, **Greek Debt restructuring in 2011** impacted on banks' profits via impairments.



- Moreover, potential losses in other Euro area sovereign debts led EBA to impose, on the 8th Dec.2011, a **prudential filter** to 71 European banks considered as SIFI => all potential losses in AFS portfolios impacted banks' capital => capital shortfall of around 115 B€.
- This filter was updated by EBA on 22 Jul.13, 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

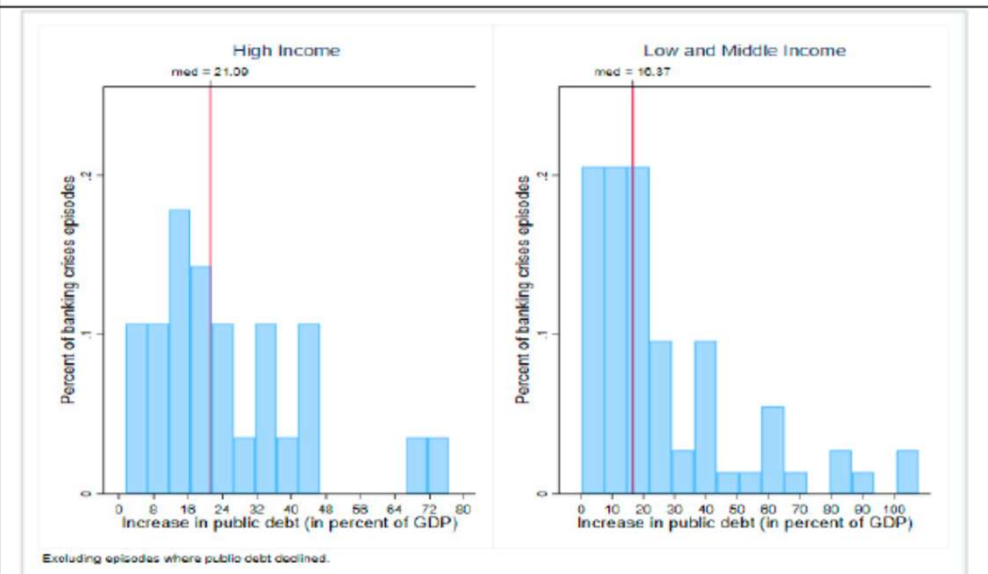
Amounts are in million Euros

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

Costs

- **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), much above the median increase in previous crises for high-income countries (around 20pp).

Figure 10. Increases in Public Debt around Banking Crises



Source: Authors' calculations.

Laeven, Luc and Fabian Valencia (2018), "Systemic Banking Crises Revisited", IMF WP/18/206.

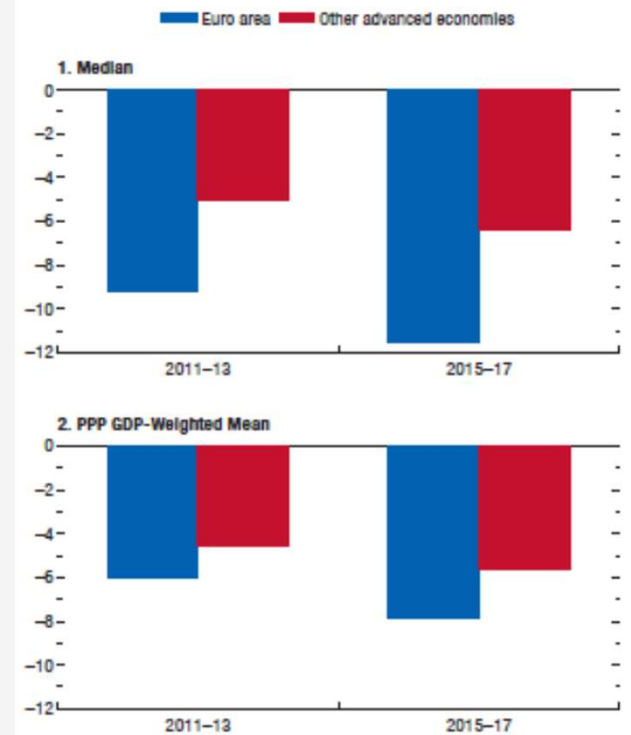
Costs

- Much higher GDP post-crisis negative deviation in Euro Area, close to 10%:

Source: IMF (2018), “World Economic Outlook”, Oct.

Figure 2.11. Postcrisis Deviations of Euro Area and Other Advanced Economies (Percent)

The median and PPP GDP-weighted mean of output loss for euro area economies are higher than for other advanced economies.



Source: IMF staff calculations.

Note: Other advanced economies are advanced economies that are not in the euro area. PPP = purchasing power parity.

Regulation

- In order to decrease the likelihood and the severity of the impact of banking crises, several regulatory initiatives were developed:
 - (i) **Basel III**
 - New capital requirements framework, including:
 - new capital buffers
 - higher minimum capital levels
 - additional requirements for SIFIs
 - International rules on liquidity
 - (ii) **New supervisory architecture in the Euro Area:**
 - Single Supervisory Mechanism
 - Stronger role of macroprudential supervision

2.6. Where are we today?

Main topics

- Introduction
- Challenged Business Model
- High Debt levels
- Increasing Credit Risk
- Larger Systemic Risk
- Increasing Shadow Banking
- Macroeconomic performance
- Financial markets
- Profitability
- Pandemic

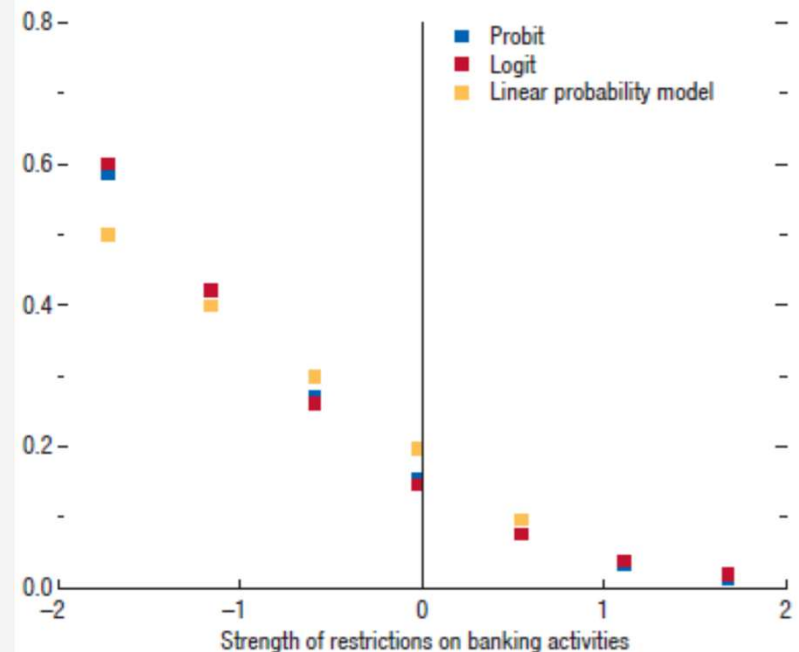
Introduction

- The Financial Sector became much more resilient, benefitting from the implementation of the regulatory reform, exhibiting much stronger capital and liquidity levels.
- According to Barth, Caprio and Levine (2013), stronger regulatory restrictions decreased the probability of banking crisis.
- Furthermore, the new financial architecture led to the adoption of supervisory stress testing and the development of macroprudential regulation, enhancing the assessment of systemic risks.

* Barth, James R., Gerard Caprio, Jr., and Ross Levine. 2013. "Bank Regulation and Supervision in 180 Countries from 1999 to 2011." NBER Working Paper 18733, National Bureau of Economic Research, Cambridge, MA.

Figure 2.10. Probability of Banking Crisis (Probability)

Stronger restrictions in 2006 on banks' ability to underwrite, broker, and deal in securities; offer mutual fund products; and engage in insurance underwriting, real estate investment, development, and management are associated with a lower probability of banking crisis in 2007–08.



Sources: Barth, Caprio, and Levine (2013); and IMF staff calculations.

Note: Movement from left to right on the x-axis indicates stronger restrictions on banking activities. Figure is based on Online Annex Table 2.2.3.

Introduction

- However, fragilities remain and some were even strengthened:

- (i) GDP growth was still incipient in most western economies before the pandemic, with prospects of returning to pre-pandemic levels not before 2022;
- (ii) Weak profitability of banks in several countries, with significant challenges to the business model;
- (iii) The level of debt increased worldwide;
- (iv) Risk to financial stability increased due to the very accommodative financial conditions, motivated by the expansionary monetary policies pursued.

Challenged Business Model

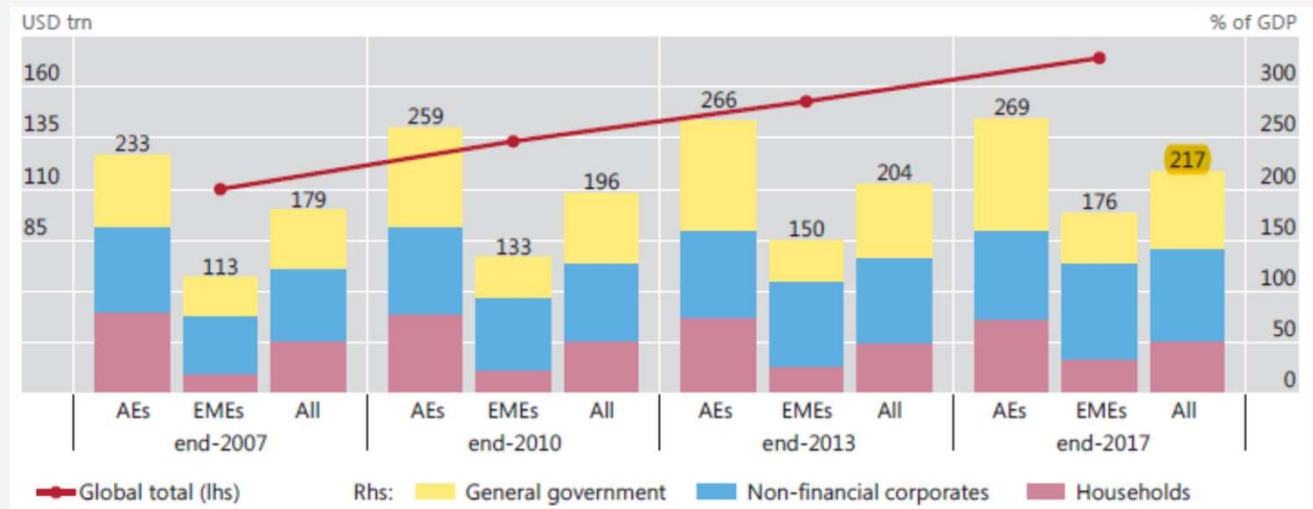
- **The business model of banking has been challenged by 3 developments:**
 - (i) low interest rates, with nominal rates becoming negative in a few countries in recent years => negative impact on profitability of banks, in particular those more reliant on maturity transformation and net interest income.
 - (ii) increased prudential requirements, regulatory scrutiny and heavy compliance costs in the wake of the 2007-2009 financial crisis. These rules have contributed significantly to enhance the stability of the financial sector, but simultaneously they have put pressure on banks' profitability and lessened their competitiveness relative to shadow banks.
 - (iii) massive application of digital technologies, improving the efficiency of incumbent banks and allowing new products, but also favoring the entry of new FinTech firms, in particular in the area of payment systems.

High debt levels

- The deleveraging was modest worldwide, namely in developed economies.

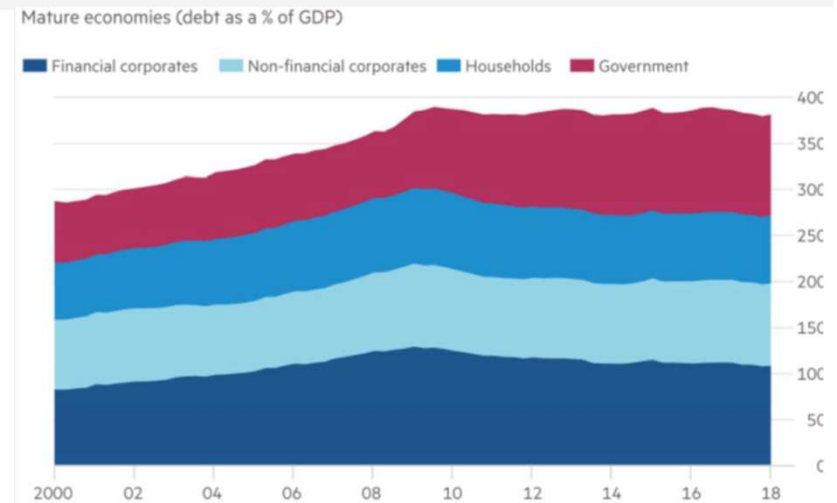
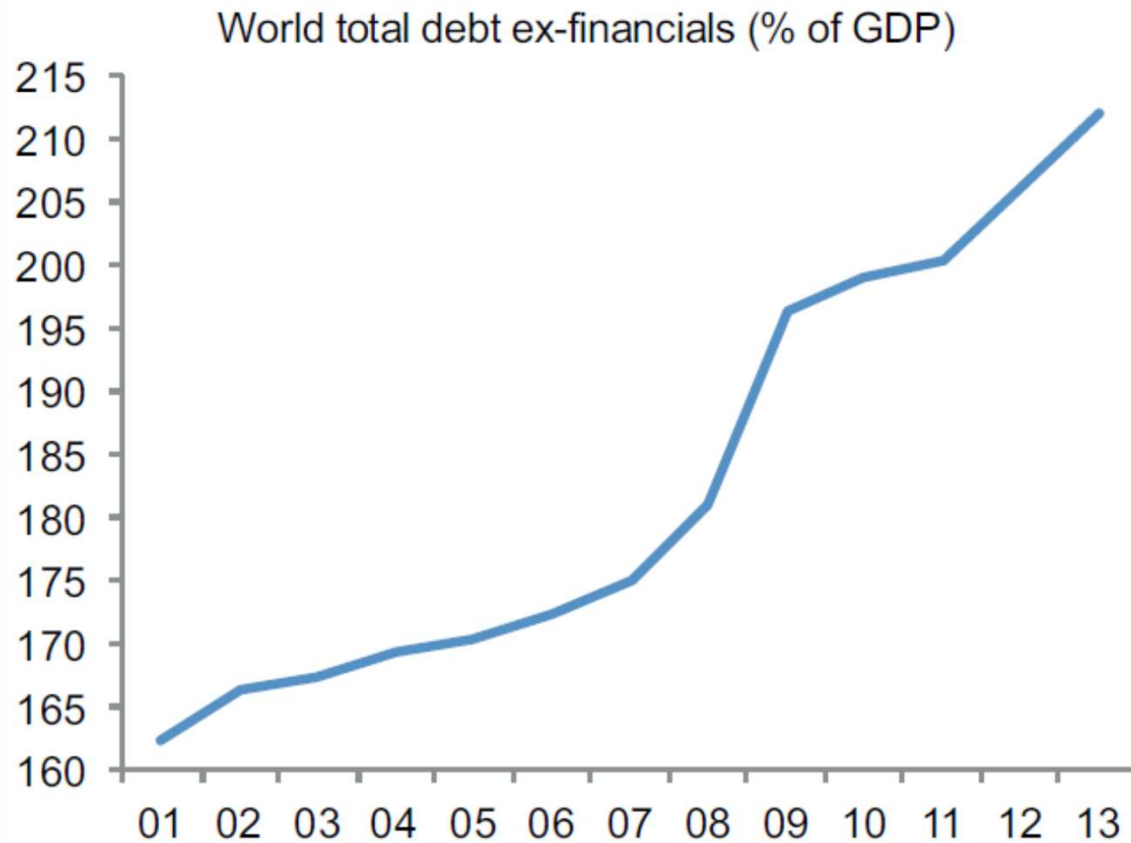


- Notwithstanding the role of excessive debt in the subprime crisis, 10 years after there was even more debt globally (227% of GDP, vs 179% in 2007), mostly due to governments in advanced and emerging economies, as well as non-financial companies and households debt in a few emerging and small-advanced economies:



Source: BIS (2018), "Annual Report".

High debt levels

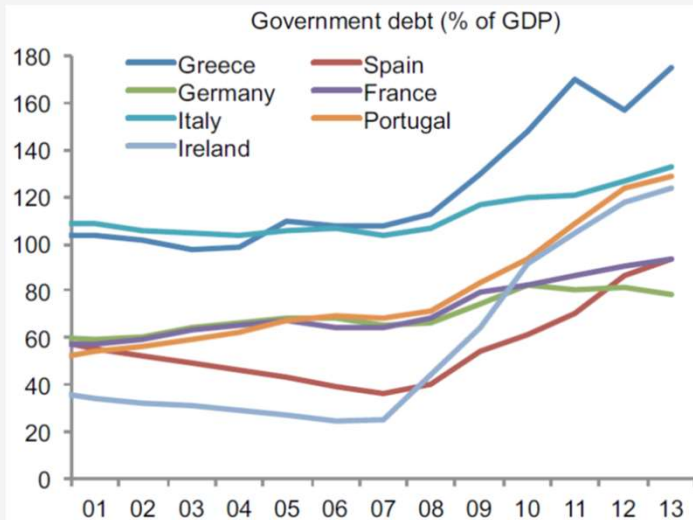


Source: Wolf, Martin (2018), “Why so little has changed since the financial crash”, 4 Sept., Financial Times.

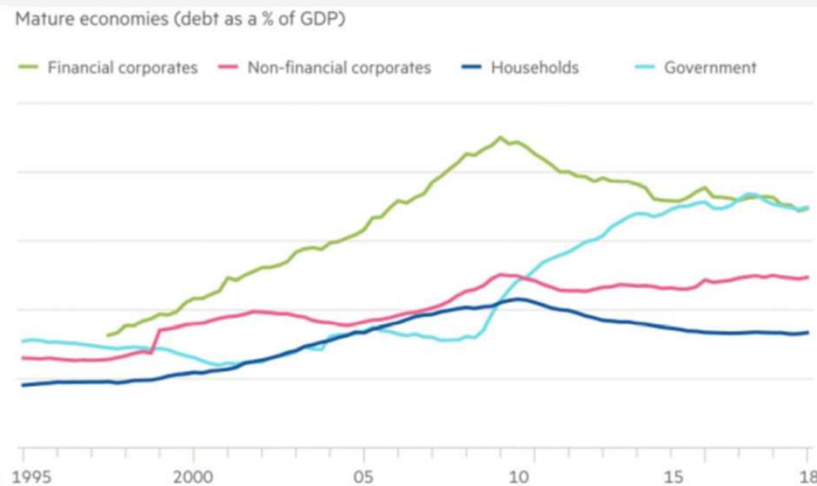
Source: Buttiglione, Luigi, Philip R. Lane, Lucrezia Reichlin and Vincent Reinhart (2014), “Deleveraging? What Deleveraging?”, Geneva Reports on the World Economy 16, September.

High debt levels

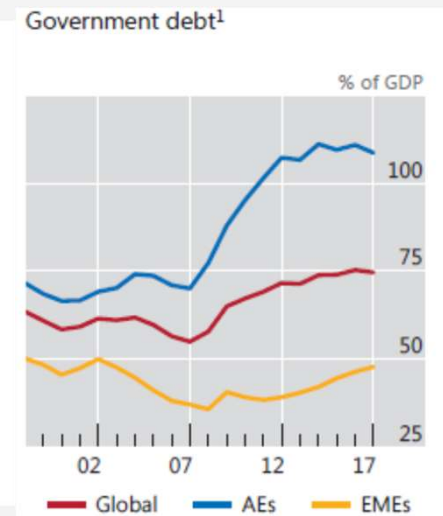
- Government Debt increased in many European countries, namely in the periphery, having stabilized and decreased slightly since 2015.
- **Private deleveraging was offset by Government leveraging.**



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



Source: Wolf, Martin (2018), "Why so little has changed since the financial crash", 4 Sept., Financial Times.



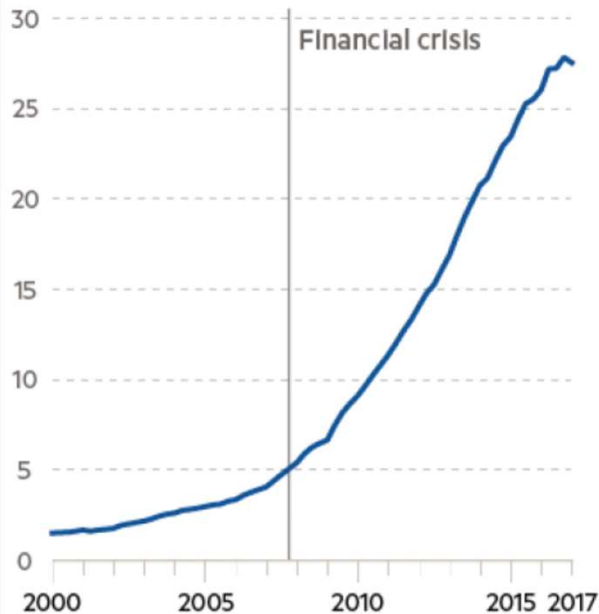
Source: BIS (2018), "Annual Report".

High debt levels

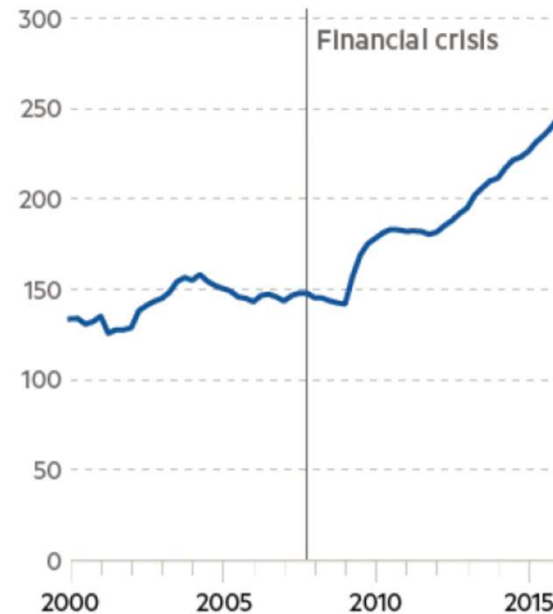
- In China, gross public and private debt almost doubled in the past decade to over 250% of GDP (even above Japan in the 1980s).

China's debt explosion

Debt in trillion US dollars



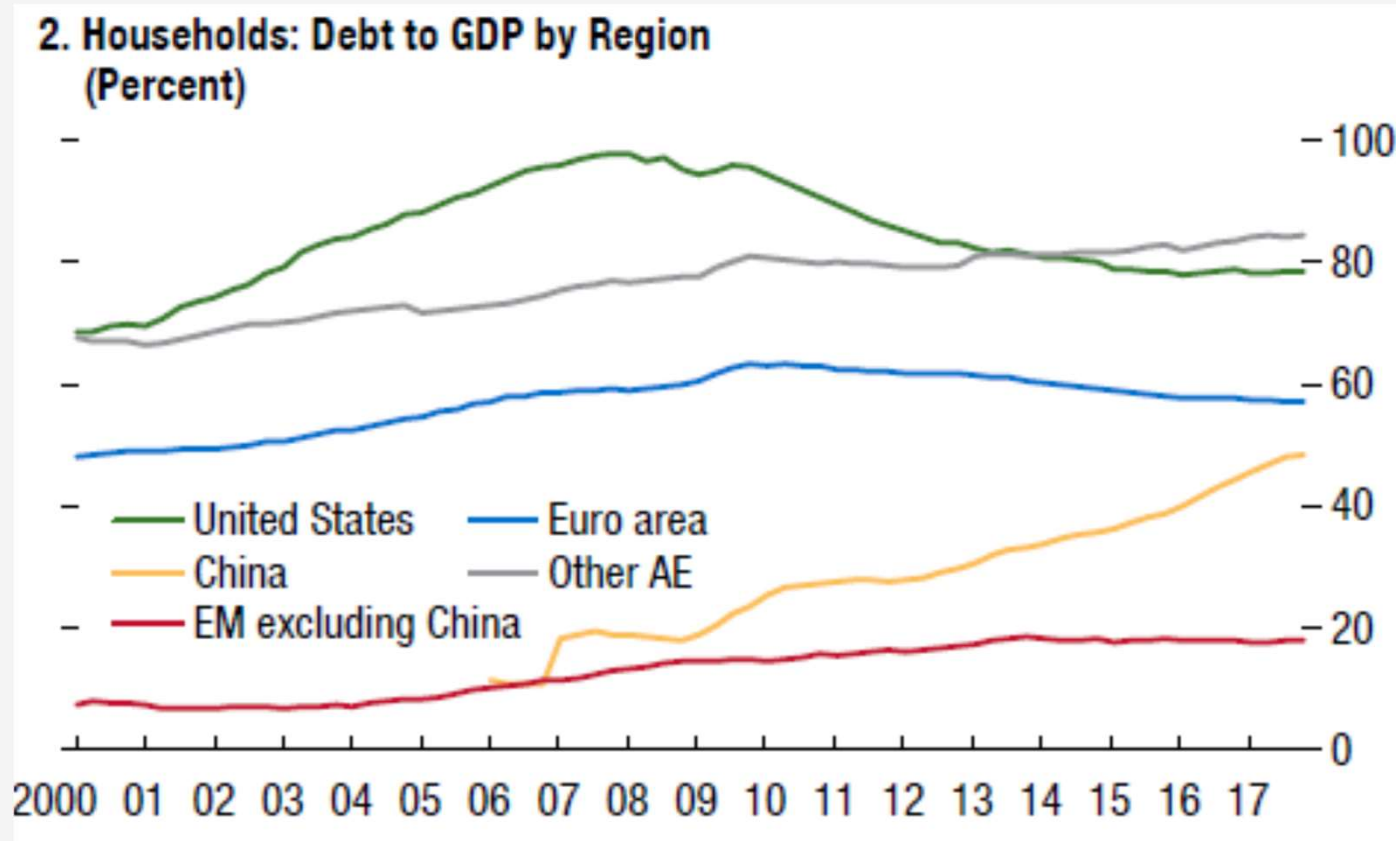
Debt as percentage of GDP



Source: Anderlini, Jamil (2017), "China's economy is addicted to debt", 15 Aug., Financial Times.

High debt levels

- China had one of the highest growth rates in household debt.



Source: IMF (2018), "Global Financial Stability Review", October.

High debt levels

- Regarding non-financial companies in advanced economies, **total corporate debt (as % GDP) has increased by 11 p.p. between 2008 and 2017**, namely in Ireland (+42 pp), Singapore (+34 pp), Canada (+28 pp) and France (+25).

Source: McKinsey Global Institute (2018), Rising Corporate Debt: Peril or Promise?"

Corporate debt has grown in many countries (1 of 2).

Nonfinancial corporate debt includes loans, bonds, and other debt securities

■ Increase by >10 pp
 ■ Increase by 0–10 pp
 ■ Decline by 0–10 pp
 ■ Decline by >10 pp

Advanced economies	Nonfinancial corporate debt, 2Q 2017		Nonfinancial corporate debt/GDP, 2Q 2017 vs. 2008, pp change
	% of GDP	\$ billion	
Ireland ¹	215	699	+42
Belgium	163	804	+22
Norway	148	568	+4
Sweden	146	783	-3
France	134	3,433	+25
Netherlands	121	990	+9
Singapore	121	369	+34
Canada	116	1,867	+28
Finland	114	286	+10
Portugal	110	237	-9
Japan	102	4,918	-5
Denmark	100	325	-8
South Korea	100	1,470	+1
Spain	100	1,301	-27
Austria	90	371	-1
Switzerland	86	593	+11
New Zealand	82	161	-19
United Kingdom	82	2,109	-21
Australia	78	1,045	-6
Italy	73	1,416	-4
United States	73	13,909	+1
Greece	62	125	0
Germany	54	1,960	-3
Advanced average	123		+11

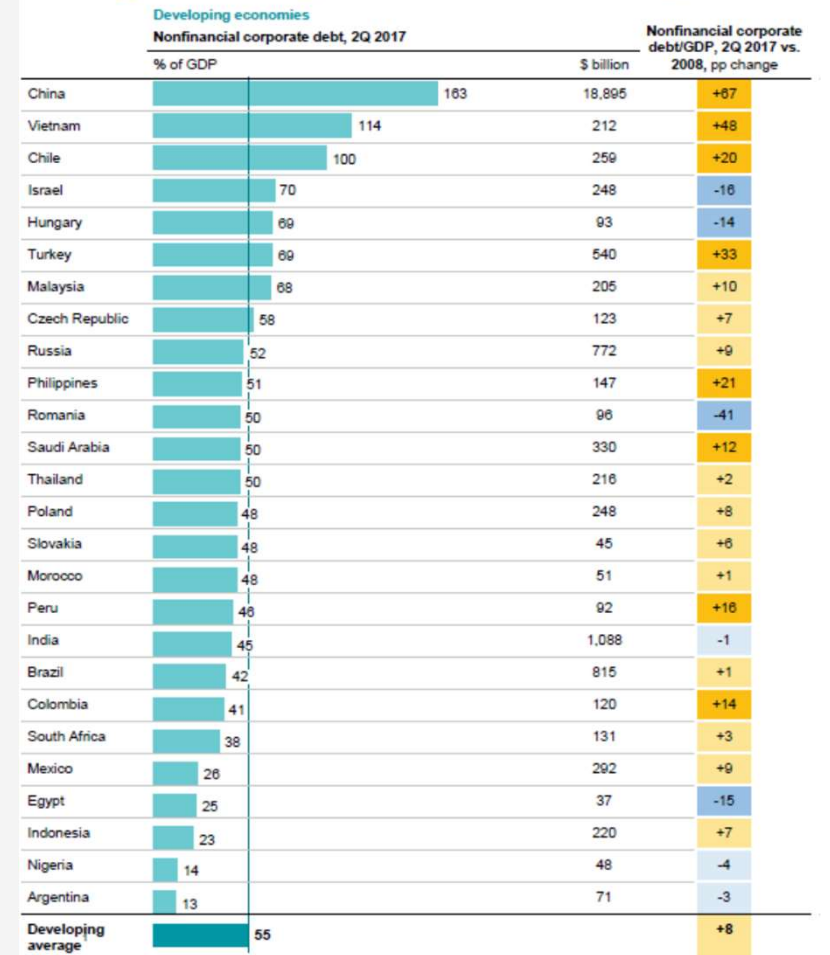
High debt levels

- Among emerging economies, the average growth was slightly lower (+8 pp), but growth in some countries has been very impressive, e.g. China (+67 pp).

Corporate debt has grown in many countries (2 of 2).

Nonfinancial corporate debt includes loans, bonds, and other debt securities

■ Increase by >10 pp
 ■ Increase by 0–10 pp
 ■ Decline by 0–10 pp
 ■ Decline by >10 pp

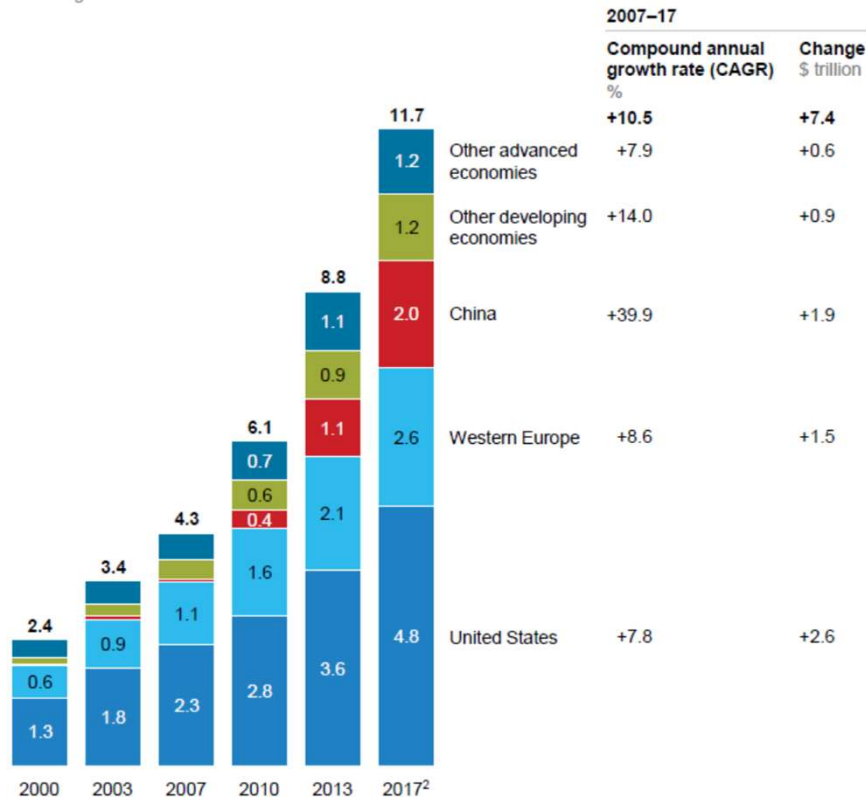


Source: McKinsey Global Institute (2018), Rising Corporate Debt: Peril or Promise?"

High debt levels

- Nonfinancial corporate bonds outstanding have almost tripled in the past decade, with increasing average maturities.

Global nonfinancial corporate bonds outstanding by region¹
\$ trillion, nominal exchange rate



Source: McKinsey Global Institute (2018), "Rising Corporate Debt: Peril or Promise?"

High debt levels

■ Corporate bonds outstanding soared in developing economies:

- China –from 70B\$ in 2007 to 2 T\$ in 2017.
- Other developing countries - increased 14%/year, from 313 B\$ in 2007 to 1.2 T\$ in 2017, namely in Brazil, Chile, Mexico, and Russia.
- High currency risks are being faced in many emerging economies, with very high shares of debt denominated in foreign currencies (e.g. China, Mexico, Chile, Brazil, Peru, Russia).

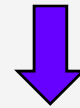
Corporate bond markets in many developing countries have grown rapidly over the past decade.

	Nonfinancial corporate bonds outstanding, 2017		Nonfinancial corporate bonds/GDP, 2017 vs. 2008 pp change	Share of bonds in nonfinancial corporate debt, 2017 ¹ %	Nonfinancial corporate bonds maturing in 2018–22 ² \$ billion	Share of foreign currency denominated nonfinancial corporate bonds maturing in 2018–22 ² %
	% of GDP	\$ billion				
Chile	22	60	+13	23	15	74
Mexico	21	239	+15	82	130	82
Malaysia	18	58	+3	28	39	35
China	16	1,981	+13	10	1,684	15
Russia	13	198	+9	26	103	57
Thailand	12	55	+4	25	44	9
Brazil	11	217	+8	27	157	60
Colombia	7	22	+7	19	13	76
Peru	7	14	+6	15	5	94
South Africa	6	19	+3	15	14	89
Philippines	5	17	+3	11	9	28
India	4	113	+3	10	63	43
Czech Republic	4	7	+3	6	5	82
Indonesia	3	32	+1	15	19	59
Argentina	3	17	+2	21	11	81
Poland	1	5	+1	2	4	89

Source: McKinsey Global Institute (2018), Rising Corporate Debt: Peril or Promise?"

High debt levels

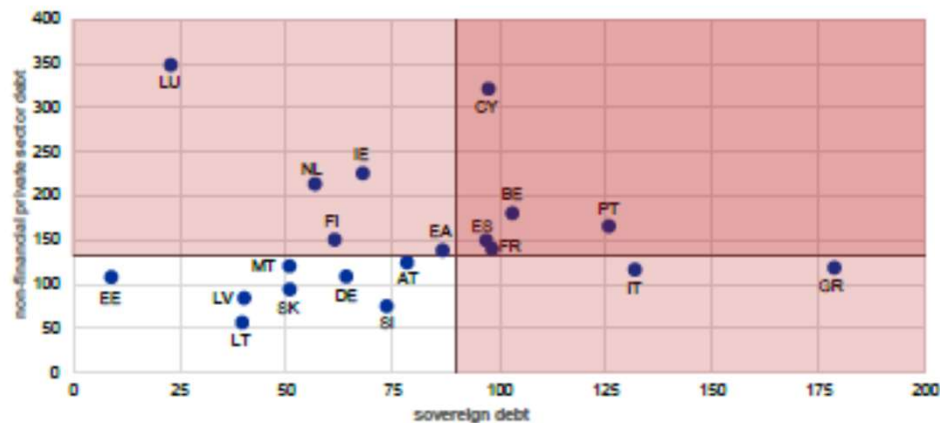
- Deleveraging in the sovereign and non-financial private sectors in EU has also been relatively slow.
- Debt-to-GDP ratios across sectors remain high in several countries, namely in the corporate and the government sectors.



High indebtedness across households, non-financial firms and governments in several euro area countries

Indebtedness of the sovereign and non-financial private sectors

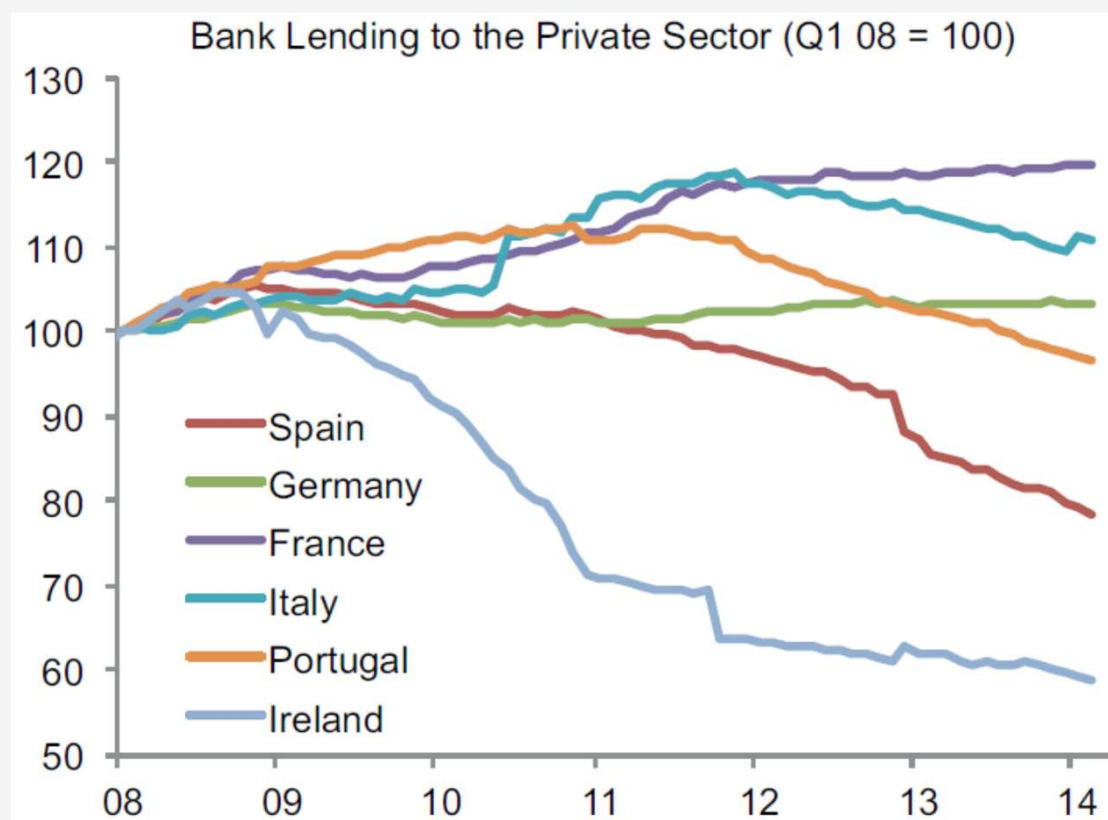
(Q4 2017; percentages of GDP)



Source: ECB (2018), “Financial Stability Review”, May.

High debt levels

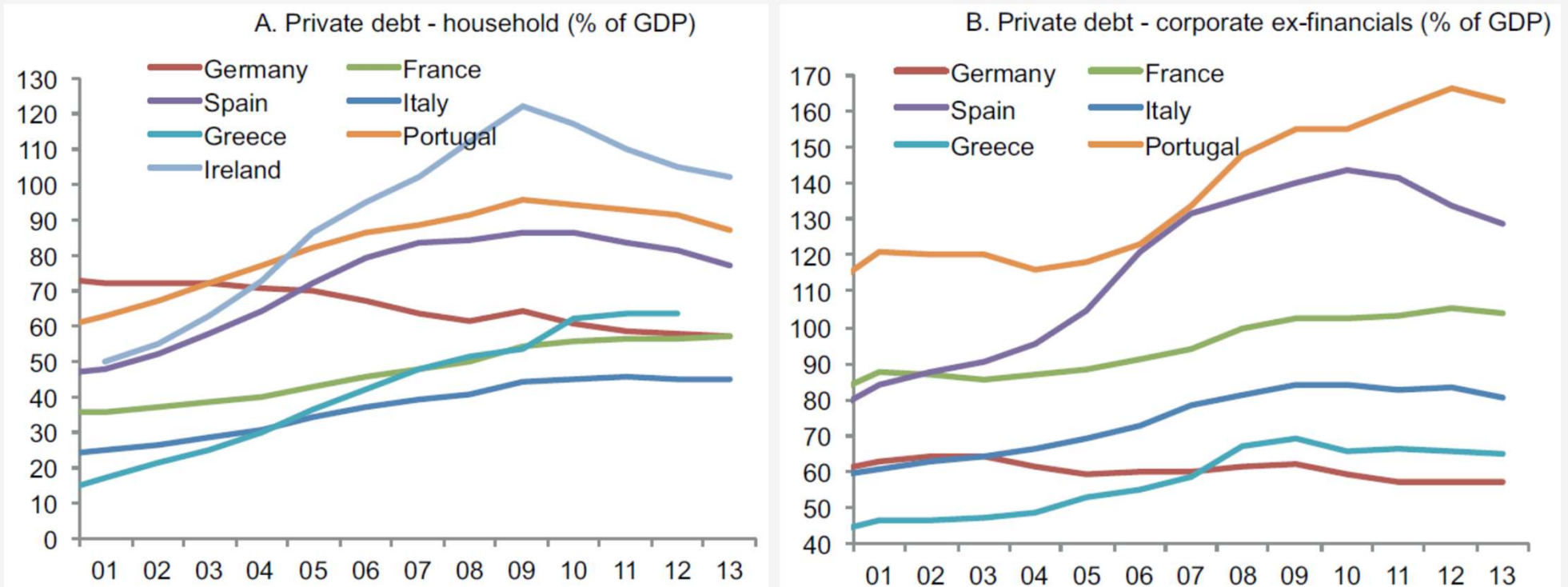
- The decrease in bank lending to the private sector in Euro Area periphery, ...



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

High debt levels

- ... allowed for a modest 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

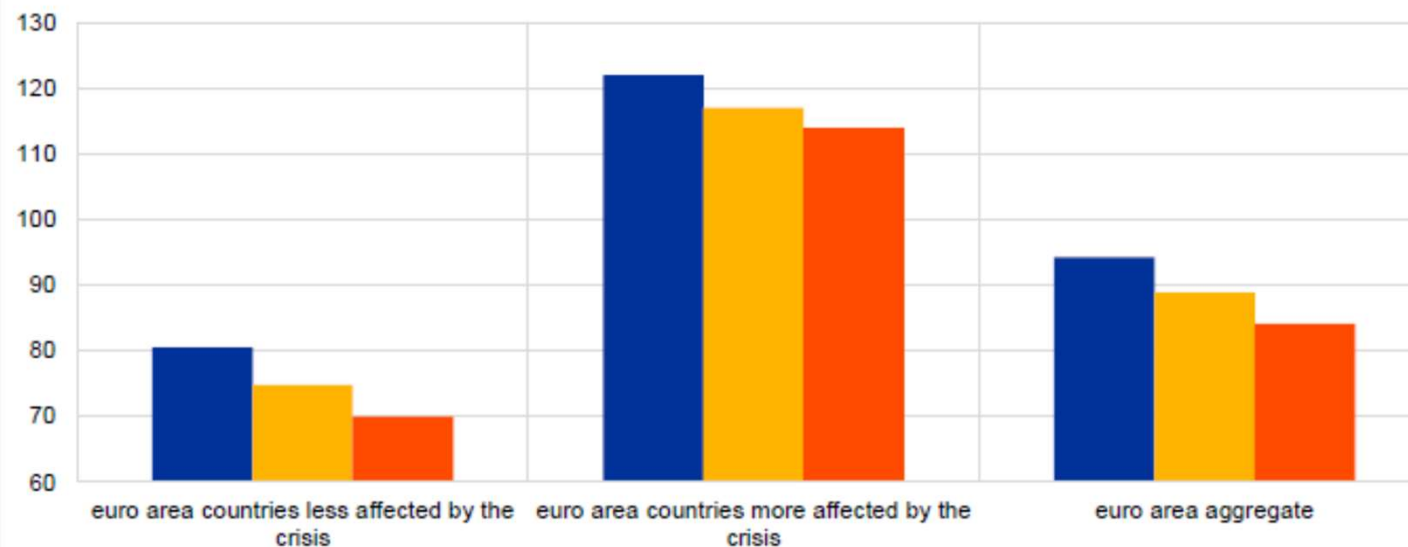
High debt levels

- Government debt/GDP ratios decreased, benefitting from improved macroeconomic performance.

General government debt-to-GDP ratios across the euro area

(percentages of GDP)

■ 2014
■ 2017
■ 2019 (forecast)



Source: ECB (2018), "Financial Stability Review", May.

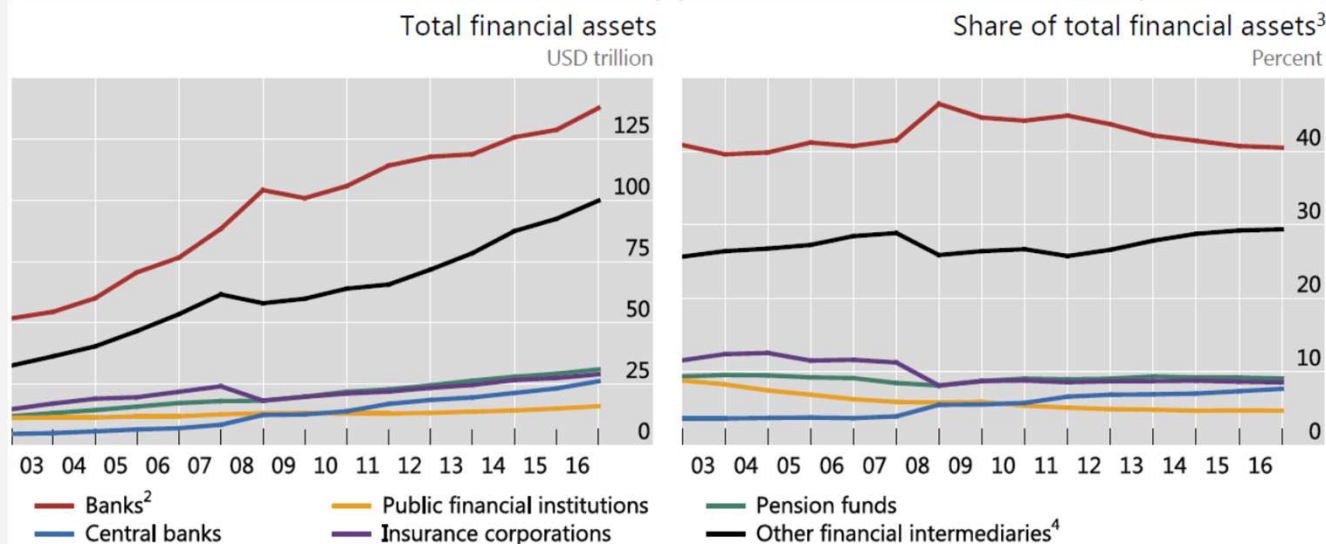
High debt levels

- **Banks assets kept increasing** since the crisis (weight on total financial assets around 40%), largely as a result of the increase in US and China bank assets.

Assets of financial intermediaries¹

21 jurisdictions and the euro area

Exhibit 2-2

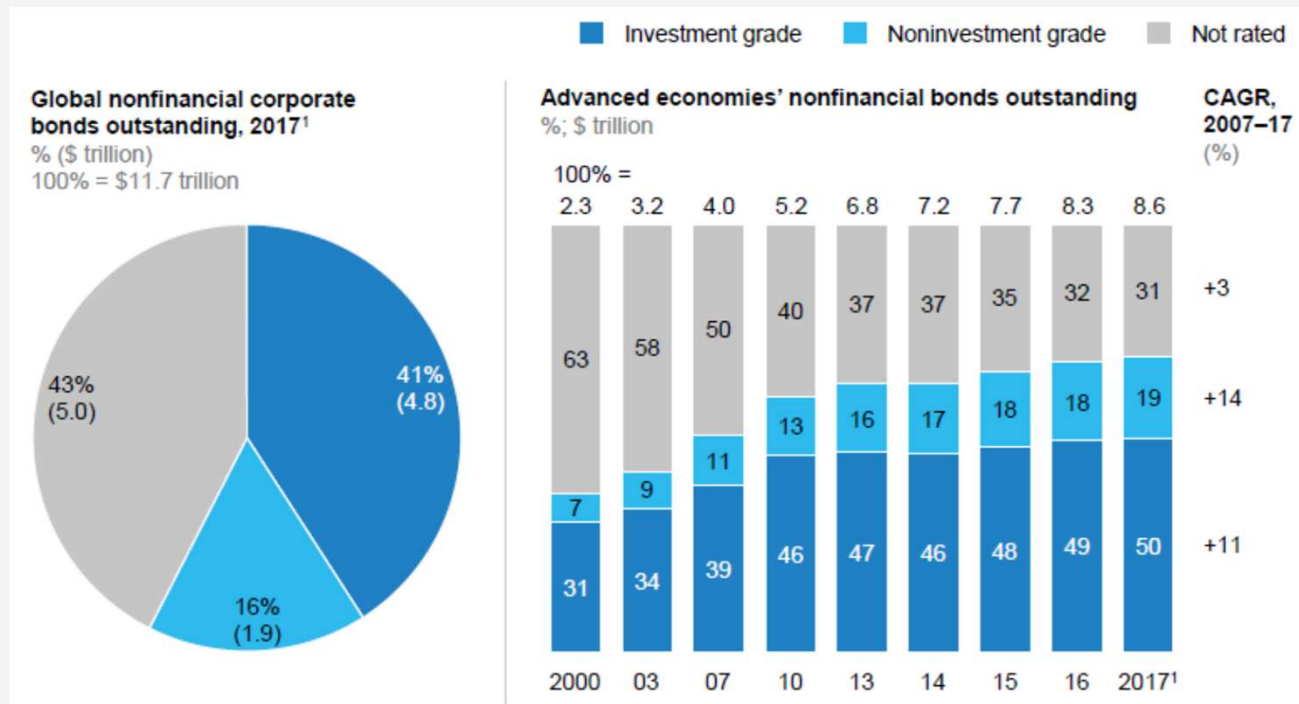


¹ Based on historical data included in jurisdictions' 2017 submissions. Exchange rate effects have been netted out by using a constant exchange rate (from 2016). ² All deposit-taking corporations. ³ Weighted average based on total national financial assets. ⁴ Also includes captive financial institutions and money lenders, and, for presentation purposes, financial auxiliaries. Increases in the value of OFI assets may also reflect improvements in the availability of data for some OFI sub-sectors over time at the jurisdiction level.

Source: FSB (2018), "Global Shadow Banking Monitoring Report 2017", 5 March.

Increasing Credit Risk

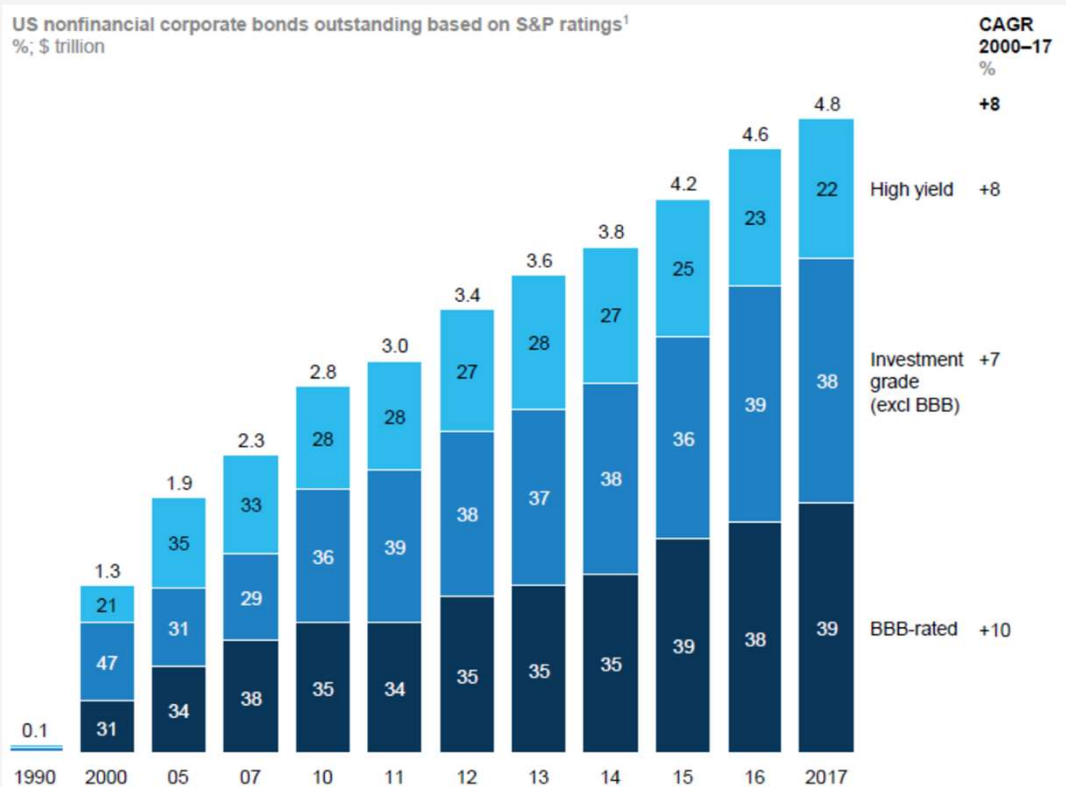
- Average credit risk has also been increasing in advanced economies, benefitting from historically low interest rates, with the outstanding volume of speculative grade bonds increasing 14%/year between 2007 and 2017 (from 500 B\$ to 1700 B\$, representing 16% of total outstanding volume globally).



Source: McKinsey Global Institute (2018), "Rising Corporate Debt: Peril or Promise?"

Increasing Credit Risk

- In US, average credit risk has also increased, with BBB bonds reaching almost 40% of total volumes issued (10 pp above 2007).



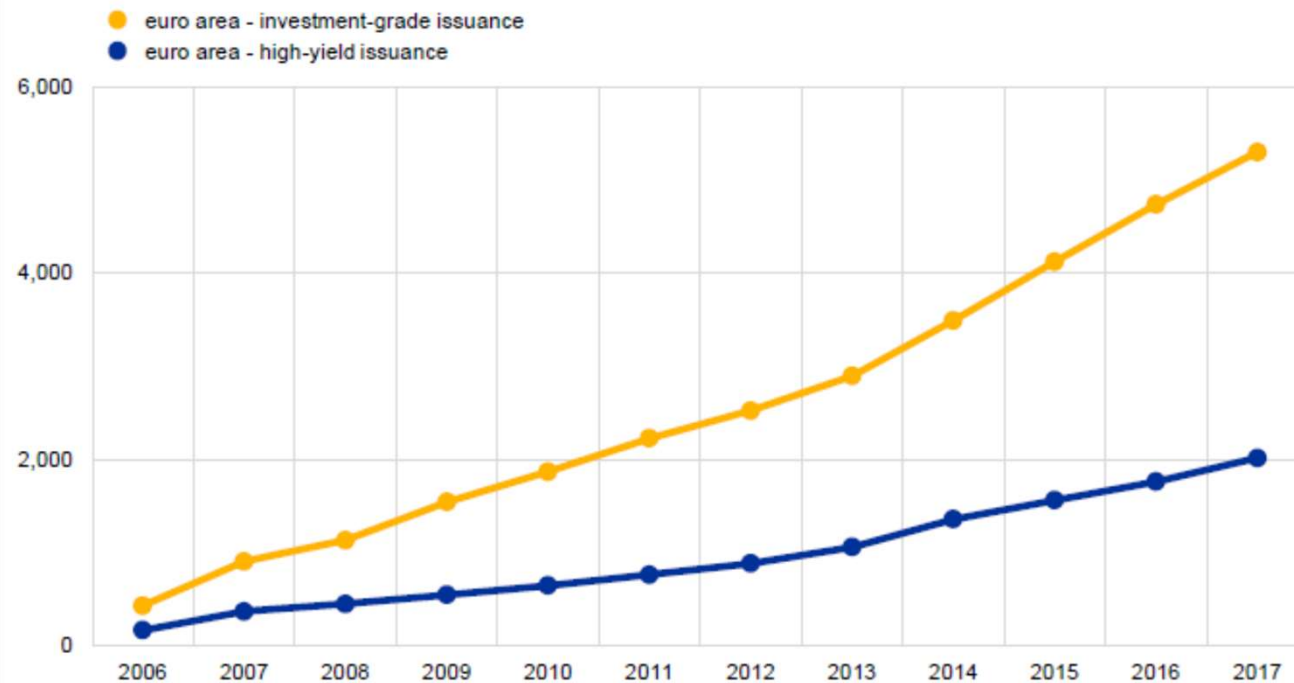
Source: McKinsey Global Institute (2018), "Rising Corporate Debt: Peril or Promise?"

Increasing Credit Risk

- In EU, bonds issued by higher credit risk corporate bonds have also increased, though less than investment grade bonds ...

Cumulative investment-grade and high-yield gross non-financial corporate debt issuance in the euro area between 2006 and 2017

(2006 to 2017; € billions)



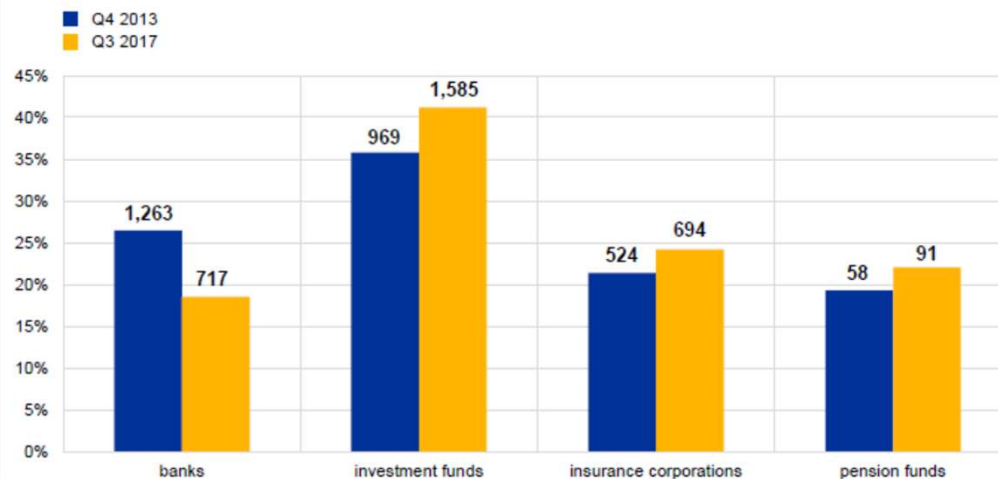
Source: ECB (2018), "Financial Stability Review", May.

Increasing Credit Risk

- ... mostly invested by non-banking entities outside the banking sector, e.g. investment and pension funds, as well as insurance companies.
- For the first time in the 38-year history of the S&P Annual Corporate Default Study, speculative-grade issuers represented the majority of global ratings at the end of 2018.

Share of lower-rated financial and non-financial corporate bonds in financial institutions' bond portfolios

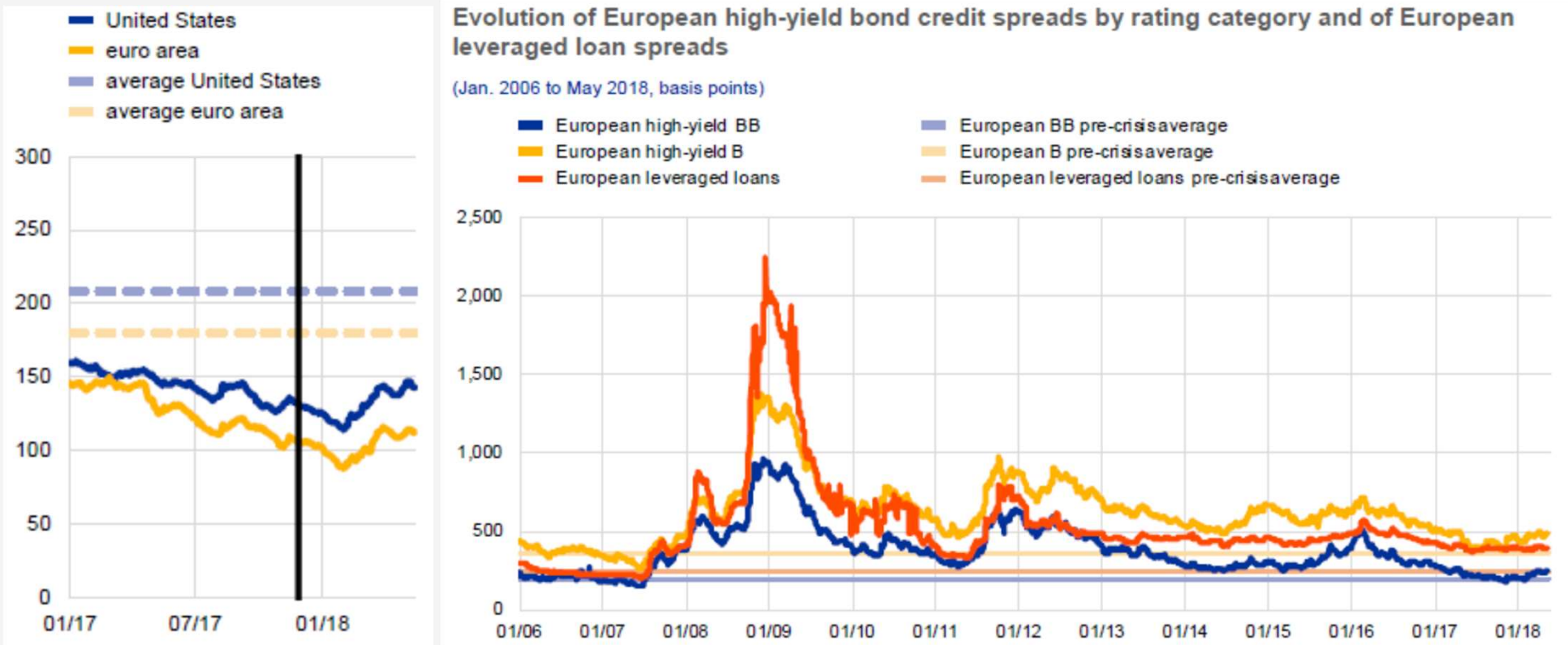
(percentages of total bond portfolio, € billions)



Source: ECB (2018), “Financial Stability Review”, May.

Increasing Credit Risk

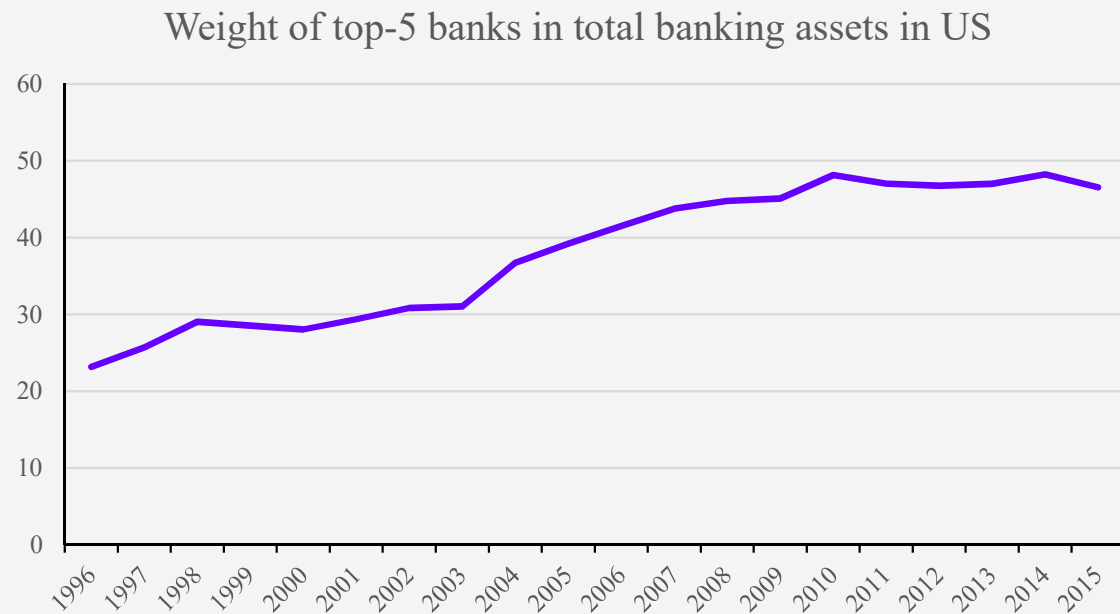
- Speculative-grade corporate bond spreads in advanced economies stayed significantly below historical averages in EA and US.



Source: ECB (2018), "Financial Stability Review", May.

Larger Systemic Risk

- After SIFIs have been considered one of the major risks for financial markets, after the failure of Lehman Brothers, **the weight of SIFIs kept increasing, e.g. in the US**, where the top-5 banks approached 50% of banking assets (44% in 2007).

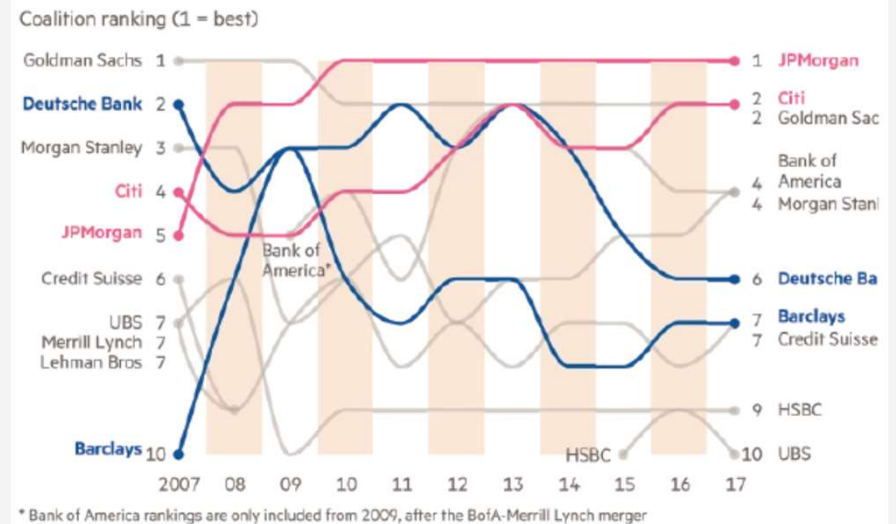


Source: St. Louis Fed

Larger Systemic Risk

- Although the subprime crisis was originated in US investment banks, these banks have increased their weight vs European banks.
- US banks benefited from an improved business environment and from the restructurings motivated by M&As occurred (e.g. JPMorgan acquisition of Washington Mutual and the Bank of America / Merrill Lynch deal).
- Conversely, European banks left the top-5 of the world investment banks ranking, after being bailed-out (e.g. RBS and UBS) or hugely capitalized by their shareholders (e.g. Deutsche Bank, Credit Suisse and Barclays) and forced to shrink their footprint.

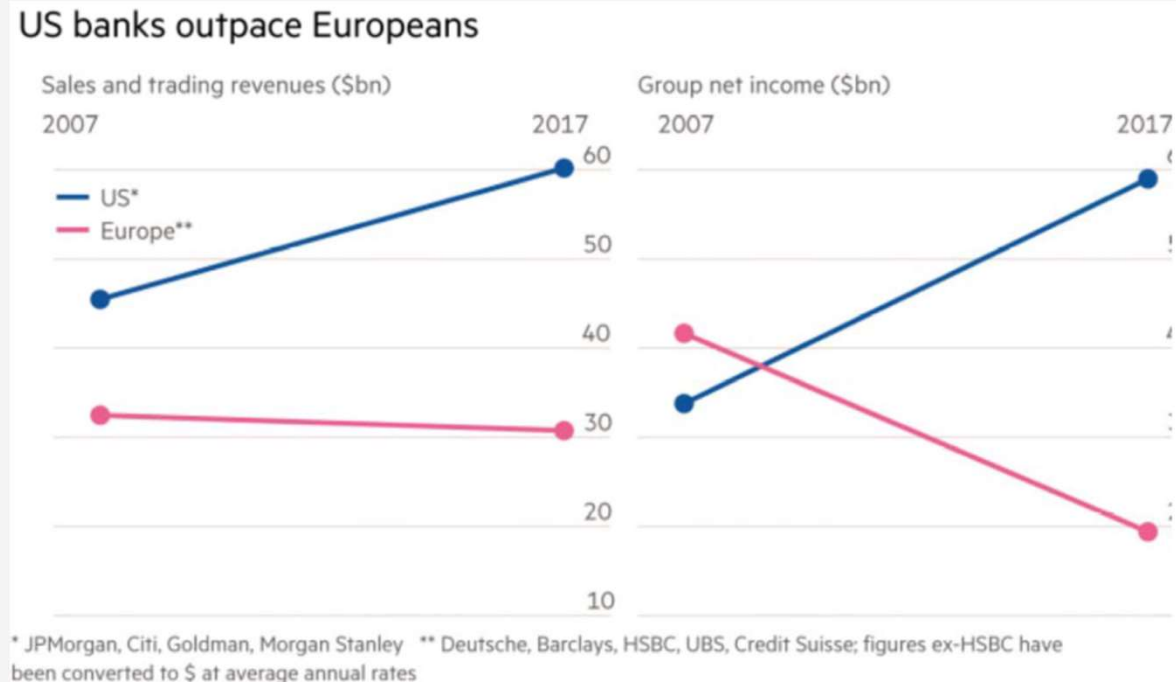
Winners and losers: how investment bank rankings have changed since the financial crisis



Source: Nonan, Laura (2018), “Investment banking: stronger franchises emerge 10 years after crisis”, Financial Times

Larger Systemic Risk

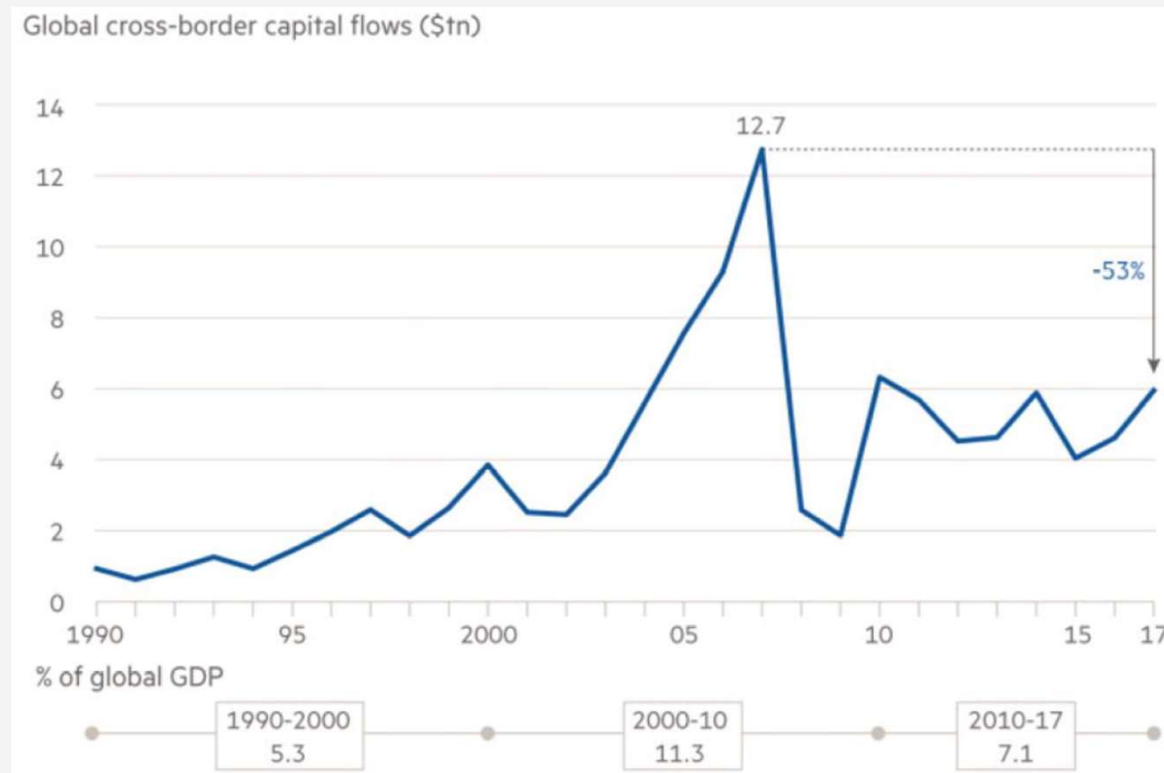
- In 2007-2017, 4 of the top 5 US players enjoyed a 33% rise in sales and trading revenues and a 75% increase in group net income.



Source: Nonan, Laura (2018), [“Easy transatlantic pickings come to end for US banks”](#), [Financial Times](#)

Larger Systemic Risk

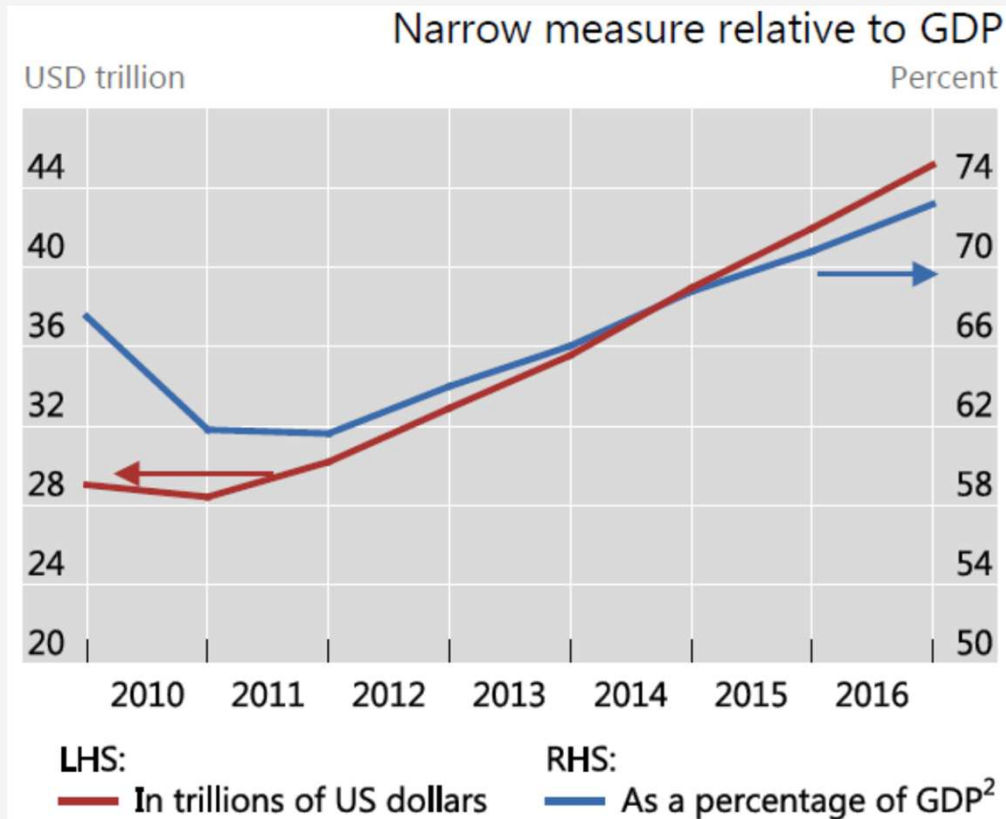
- The world banking system became even more interconnected.



Source: Wolf, Martin (2018), “Why so little has changed since the financial crash”, 4 Sept., Financial Times.

Increasing Shadow Banking

- **Shadow banking increased its size:** from \$29T in 2010 to \$45T in 2016 (total assets), as a response to a larger regulatory burden on FIs.



Source: Financial Stability Board (2018), “Global Shadow Banking Monitoring Report 2017”, 5 Mar.

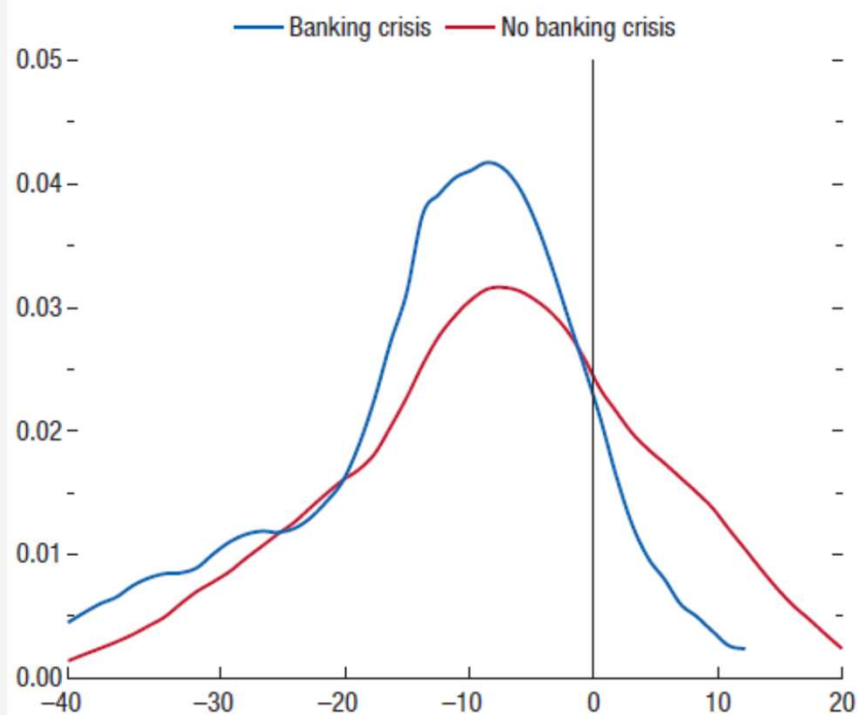
Macroeconomic performance

- Among the 24 economies that suffered a banking crisis in 2008, 85% still exhibited in 2017 a GDP level below the pre-crisis trend, most of them 10% below that trend.
- Even 60% of the economies that haven't faced a banking crisis were still below the referred trend, namely due to weaker external demand from the countries that suffered banking crisis.

Figure 2.3. Postcrisis Output Deviations from Precrisis Trend, 2015–17

(Kernel density)

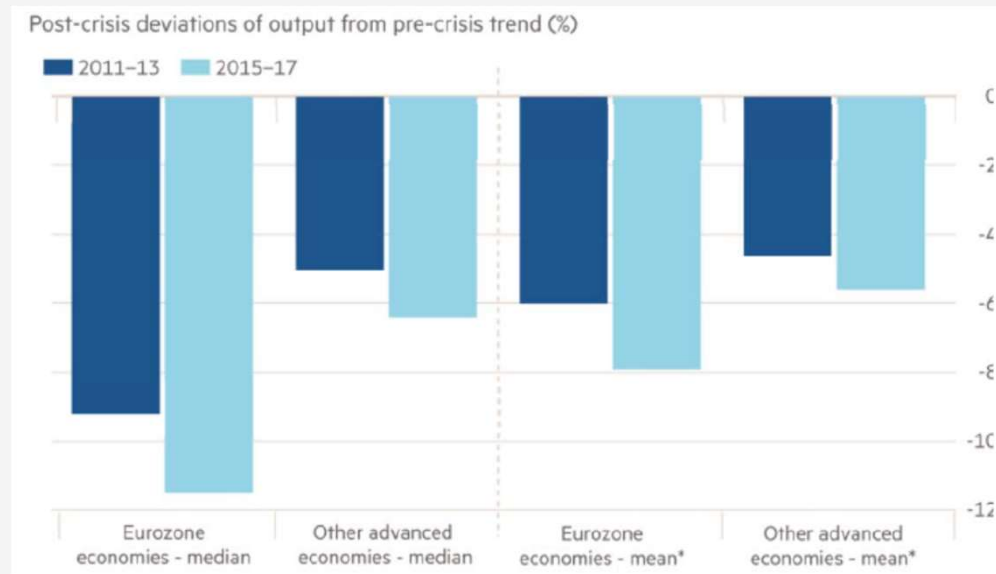
Output losses are persistent for a variety of economies, not just those that suffered a systemic banking crisis in 2007–08.



Source: IMF (2018), “World Economic Outlook”, Oct.

Macroeconomic performance

■ Higher deviations in Eurozone:



Source: Wolf, Martin (2018), "How to avoid the next financial crisis", 9 Oct., Financial Times.

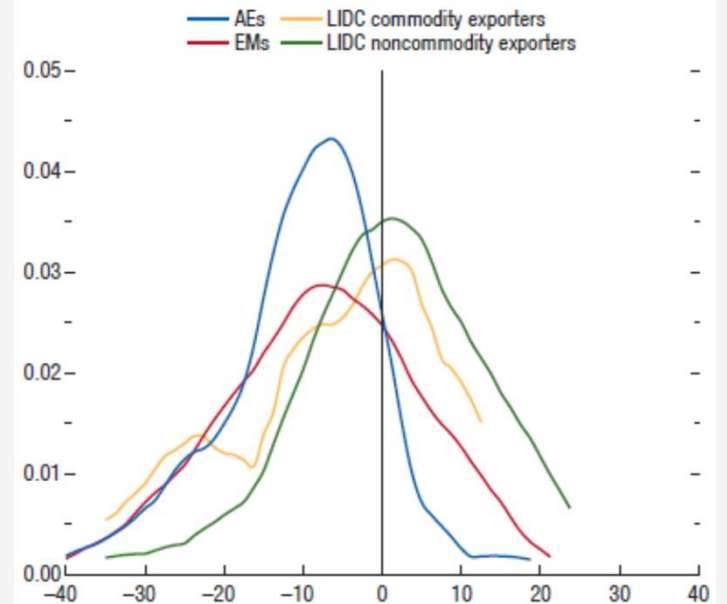
Macroeconomic performance

- Even though the financial crisis impacted much more severely on developed countries, **output negative variations were observed in all groups of countries.**

Source: IMF (2018), “World Economic Outlook”, Oct.

Figure 2.4. Postcrisis Output Deviations from Precrisis Trend by Country Group, 2015–17
(Kernel density)

Postcrisis output deviations tend to be large across advanced economies, emerging markets, and low-income developing countries, with relatively more balanced gains and losses for noncommodity-exporting low-income developing countries and emerging markets than for the other two groups.

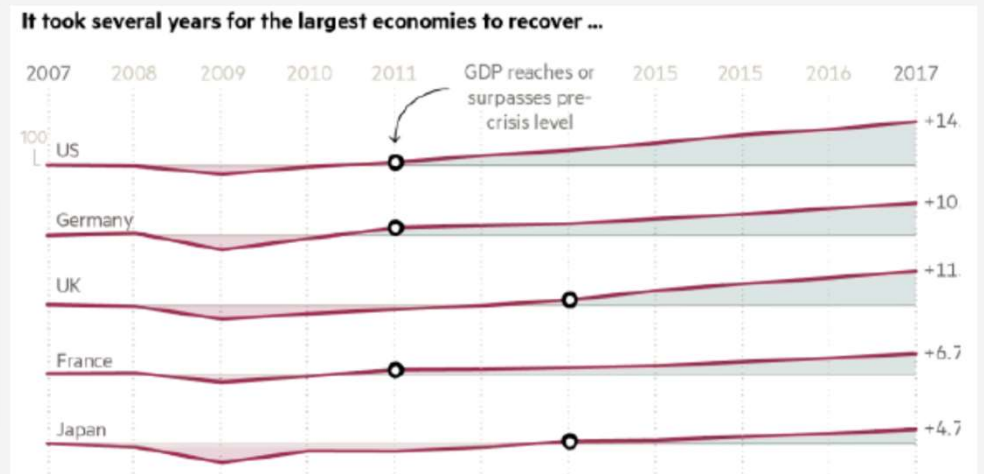
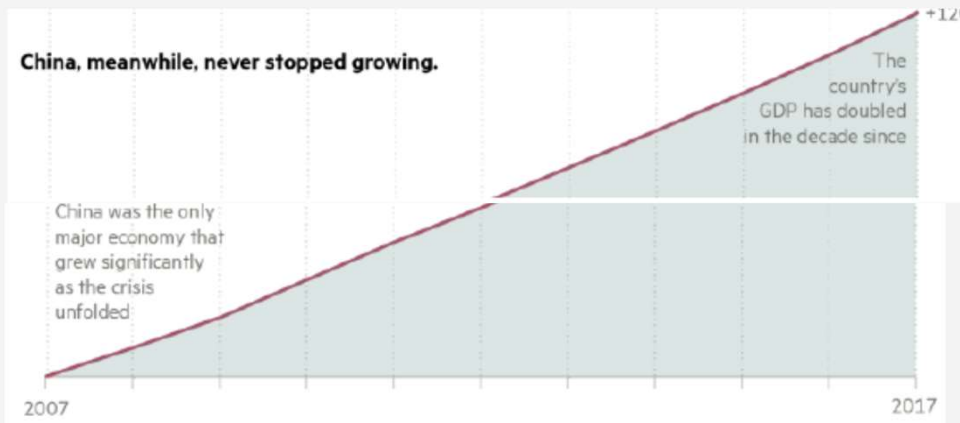


Source: IMF staff calculations.

Note: Distribution of average percent deviations from precrisis trend, 2015–17. AEs = advanced economies; EMs = emerging markets; LIDC = low-income developing country. See Online Annex 2.1 for country groupings.

Macroeconomic performance

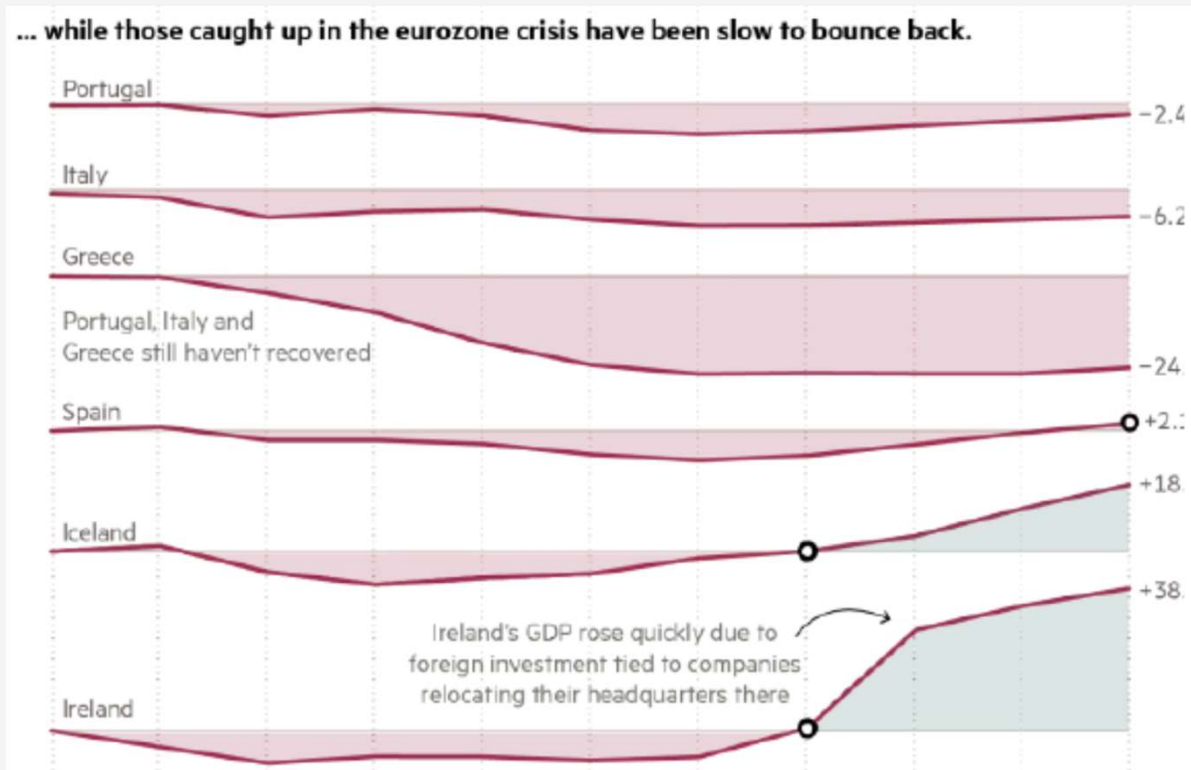
- China kept growing, while GDP in largest economies recovered until the pandemic.



Source: Manibog , Claire and Stephen Foley (2017), “The long and winding road to economic recovery”, 10 Aug., FT.

Macroeconomic performance

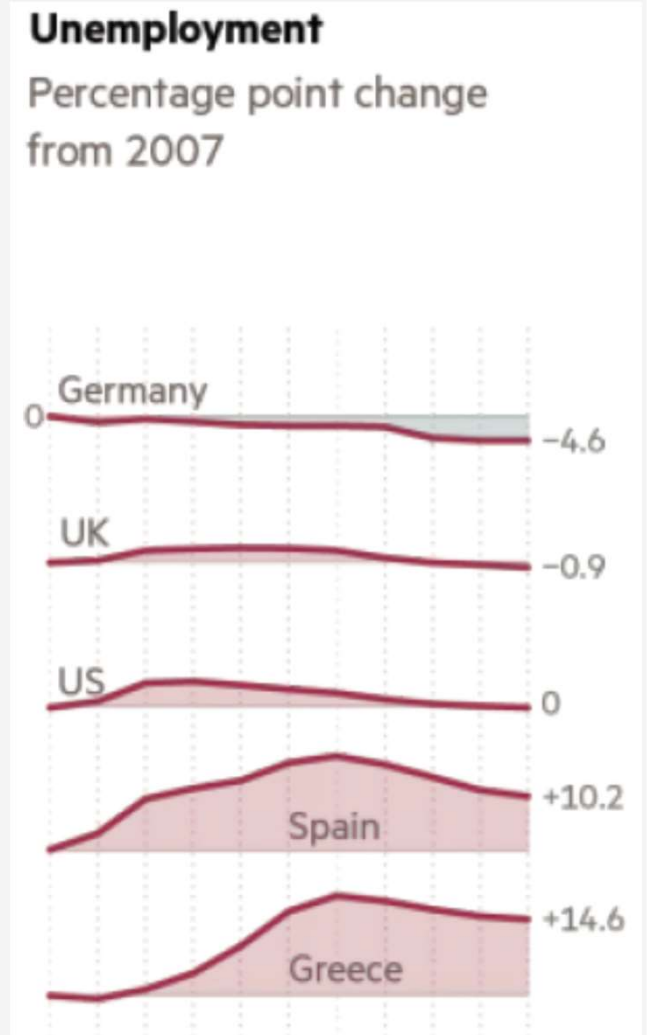
- In 2017, some Eurozone countries afflicted by the crisis were still below 2007 levels, namely Greece (-24%), ...



Source: Manibog , Claire and Stephen Foley (2017), “The long and winding road to economic recovery”, 10 Aug., FT.

Macroeconomic performance

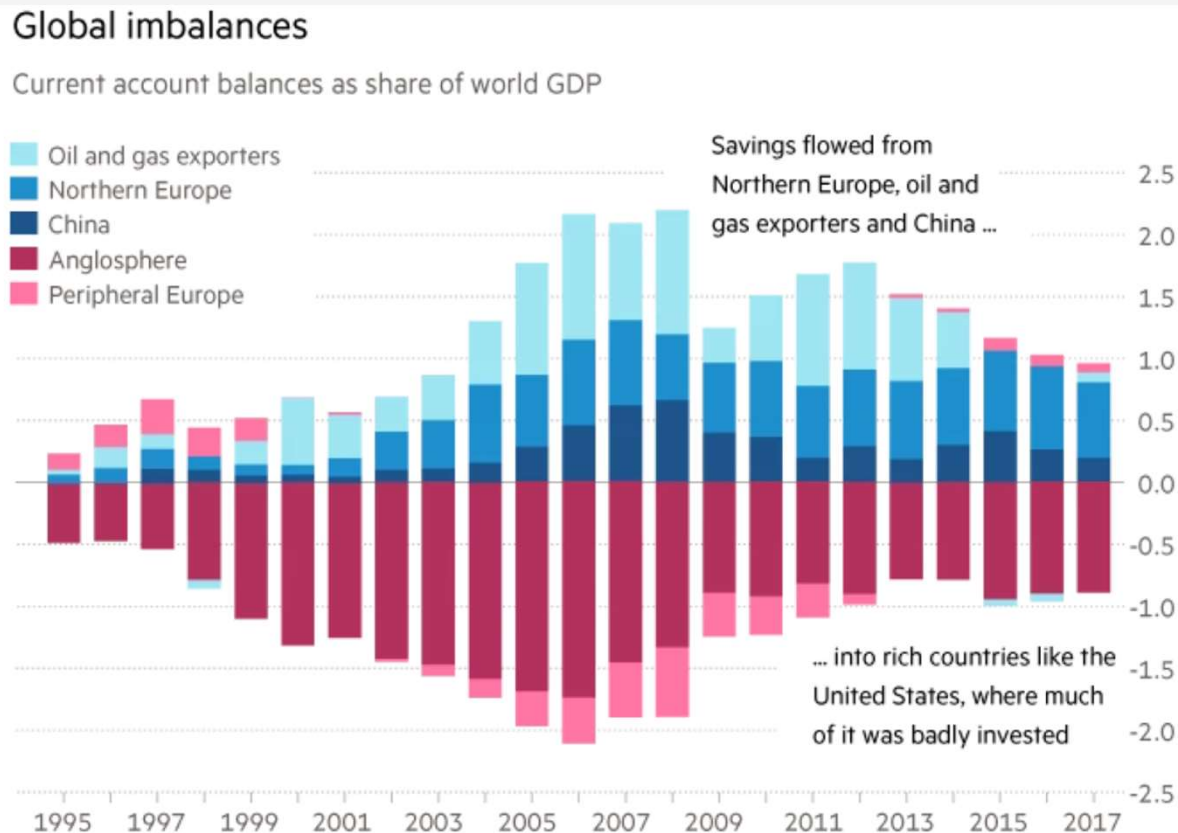
- , .. keeping much higher unemployment rates.



Source: Manibog , Claire and Stephen Foley (2017), “The long and winding road to economic recovery”, 10 Aug., FT.

Macroeconomic performance

- UK and US current account deficits and China surplus narrowed since the crisis, while European peripheral countries moved from deficit to surplus.



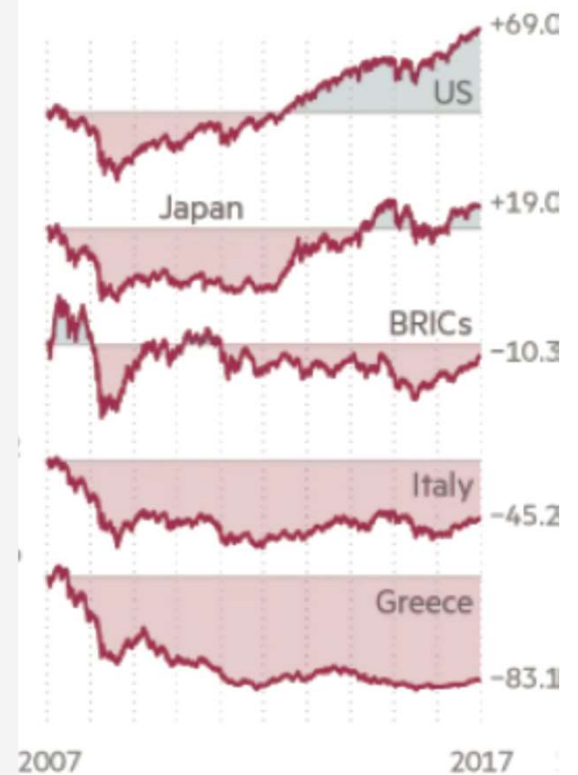
Source: Armstrong, Robert (2017), "Whatever happened to the global savings glut?", 14 Aug., FT.

Financial Markets

- Stock markets recovered fast in the US, but neither in emerging markets, nor in other Euro Area countries most afflicted by the Government debt crisis.

Stock markets

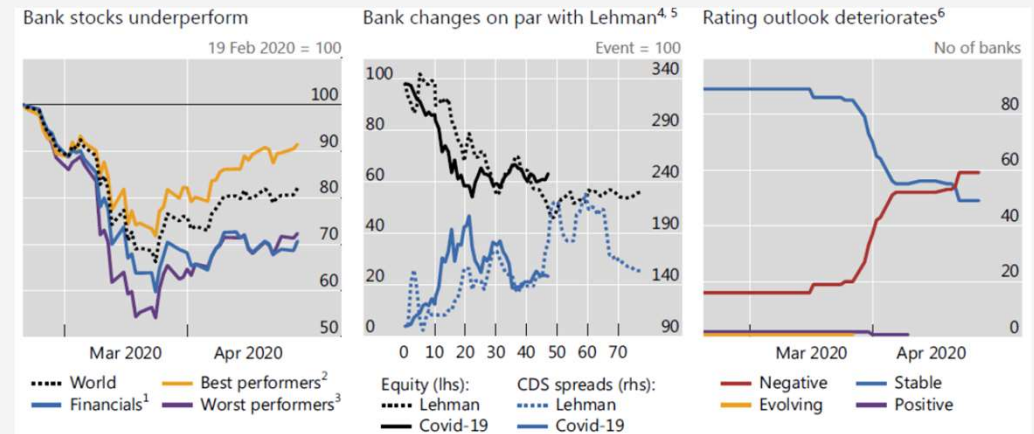
Major equity indices
rebased to Aug 2007*



Source: Manibog, Claire and Stephen Foley (2017), “The long and winding road to economic recovery”, 10 Aug., FT.

Financial Markets

- While markets were generally stable during the first 7 weeks of the year, things changed quickly after 19 Feb., with concerns about the spread of the pandemic and its macroeconomic impacts.
- Bank stock prices initially fell in line with the overall market, but after the onset of a generalized and severe stock market sell-off on 5 March, banks joined the worst performers.
- **The decline of bank stock prices and the CDS spread increases reached similar levels to those observed following the collapse of Lehman Brothers in 2008.**
- Accordingly, banks' long-term rating outlooks deteriorated, reflecting concerns over the impact of Covid-19 on bank earnings.

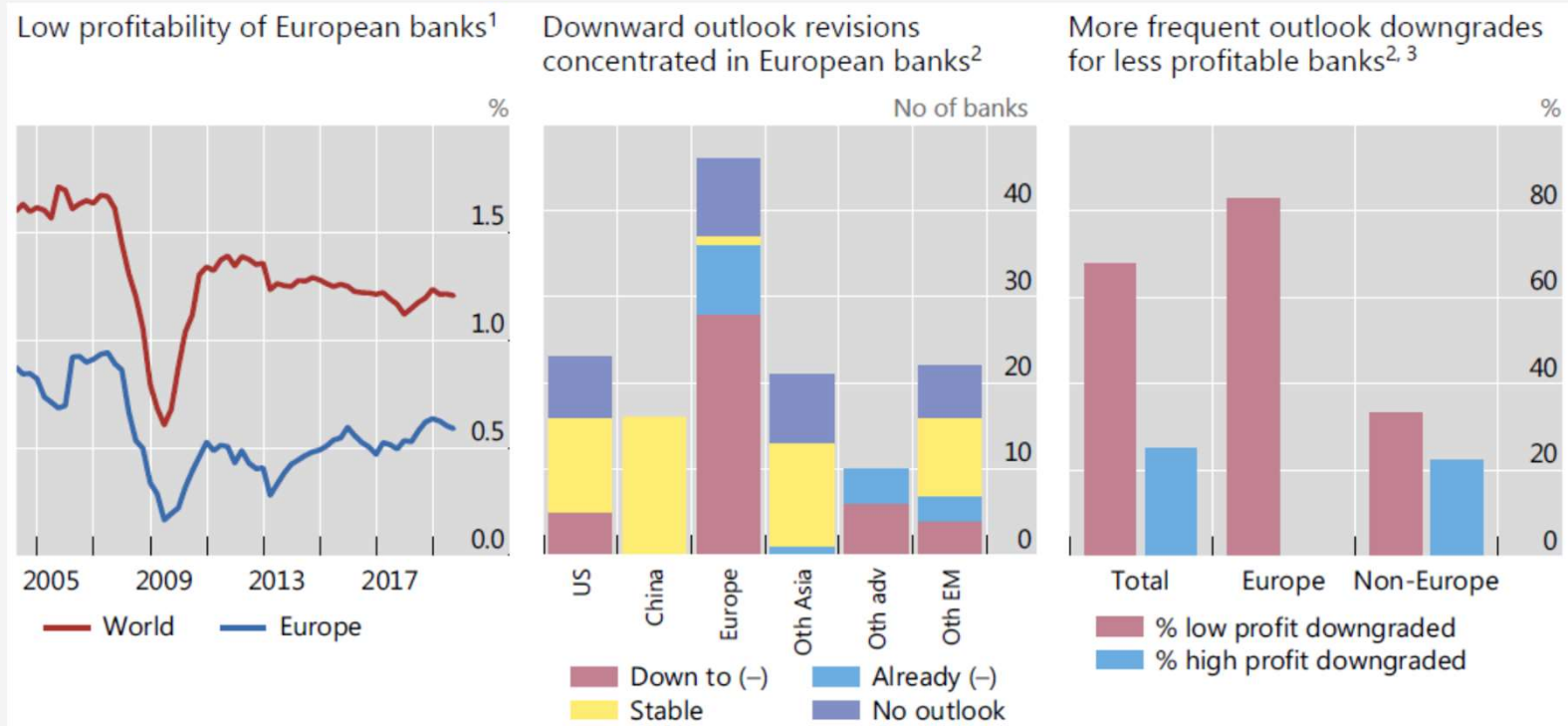


Source: Aldasoro, Iñaki, Ingo Fender, Bryan Hardy and Nikola Tarashev (2020), “Effects of Covid-19 on the banking sector: the market’s assessment “, BIS Bulletin No. 12, 7 May.

¹ Average of Banks and Financial Services global equity indices, based on market value. ² Average of Health Care and Technology global equity indices, based on market value. ³ Average of Energy and Basic Resources global equity indices, based on market value. ⁴ Covid-19: 19 Feb 2020 = 100; Lehman Brothers: 12 Sep 2008 = 100. Scaling preserves unit changes. ⁵ The horizontal axis indicates number of trading days since the start of the relevant episode. ⁶ Fitch long-term rating outlook for a constant sample of 108 banks. Rating outlooks were fairly stable in the months leading up to March 2020.

Financial Markets

- Most downgrades occurred among European banks, due to their lower profitability, ...



Source: Aldasoro, Iñaki, Ingo Fender, Bryan Hardy and Nikola Tarashev (2020), “Effects of Covid-19 on the banking sector: the market’s assessment”, BIS Bulletin No. 12, 7 May.

Financial Markets

- ... comparing to other jurisdictions worldwide.

RETURN ON CAPITAL BY REGION, 2020	
Region	Return on capital (%)
Central Asia	30.60
South America	21.55
Africa	19.49
Caribbean	19.02
Central America	17.26
Central and Eastern Europe	15.04
North America	14.40
Middle East	12.41
Asia-Pacific	9.78
Europe	6.71

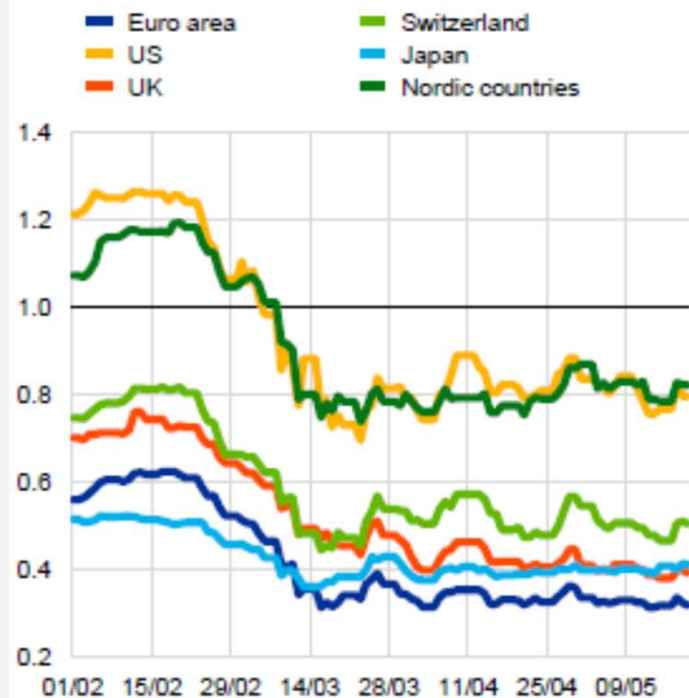
Source: Caplen, Brian (2020), "Is M&A the way out for Europe's banks?", Brian Caplen, Sept 8

Financial Markets

- Accordingly, stock prices in Euro area fell by a larger extent than in other jurisdictions.

Evolution of banks' price-to-book ratios

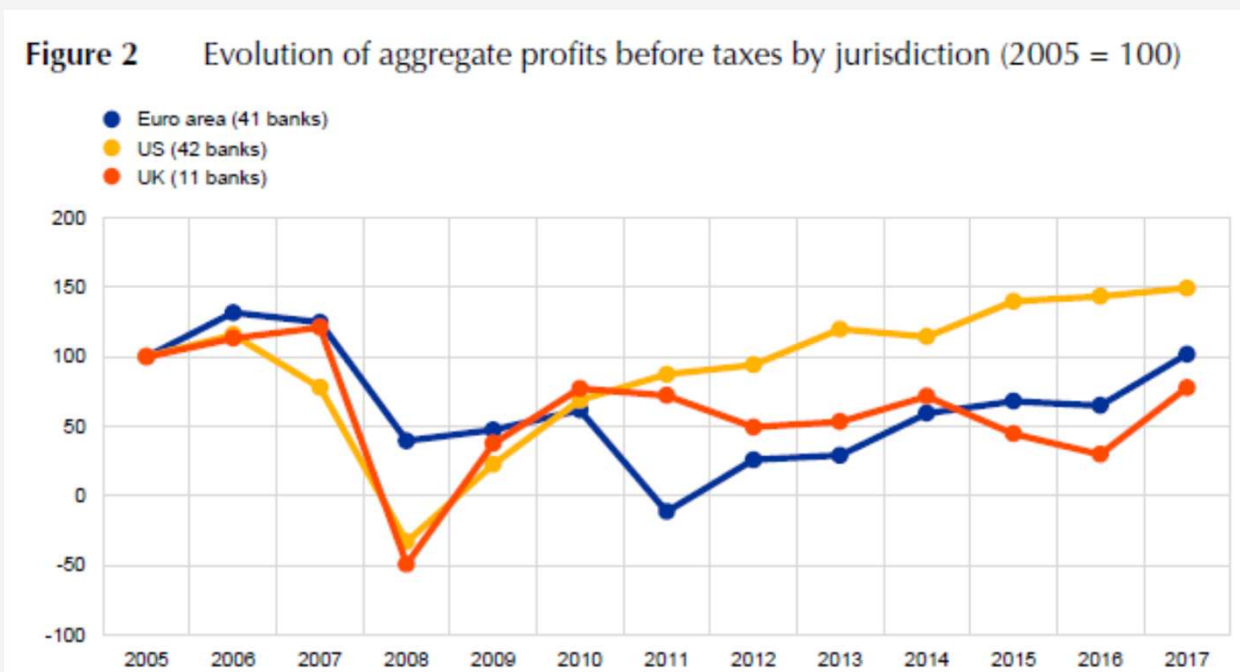
(1 Feb.-20 May 2020, ratio)



Source: IMF (2020), "Global Financial Stability Report", Apr.

Profitability

- Aggregate profits improved by a much larger extent in US than in the Euro Area:

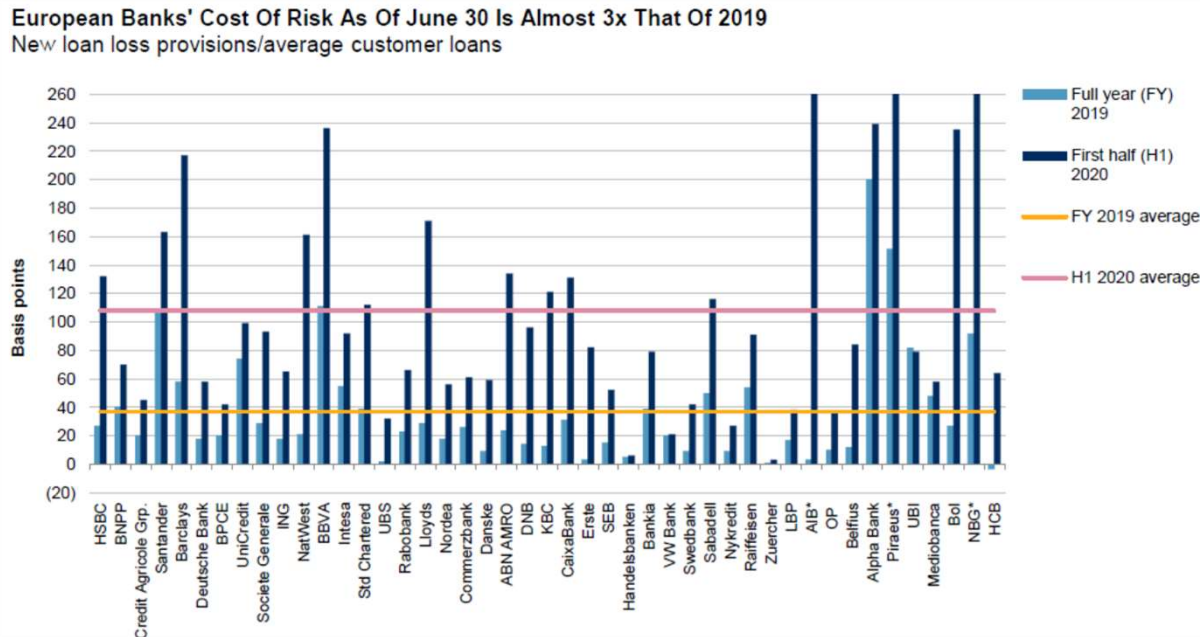


Source: Carletti, Elena, Stijn Claessens, Antonio Fatas and Xavier Vives (2020), *The Bank Business Model in the Post-Covid-19 World, The Future of Banking 2*, CEPR.

- The improvement can be at least partly explained by an expansion of fee-generating businesses, a reduction in the level of NPLs in weaker banks and a strong focus on growth in stronger banks.

Pandemic

- The Covid-19 induced crisis may affect the financial system by:
 - (i) increasing bad loans => increasing impairments;
 - (ii) keeping interest rates low for a longer period; and
 - (iii) accelerating previous tendencies such as digitalization.

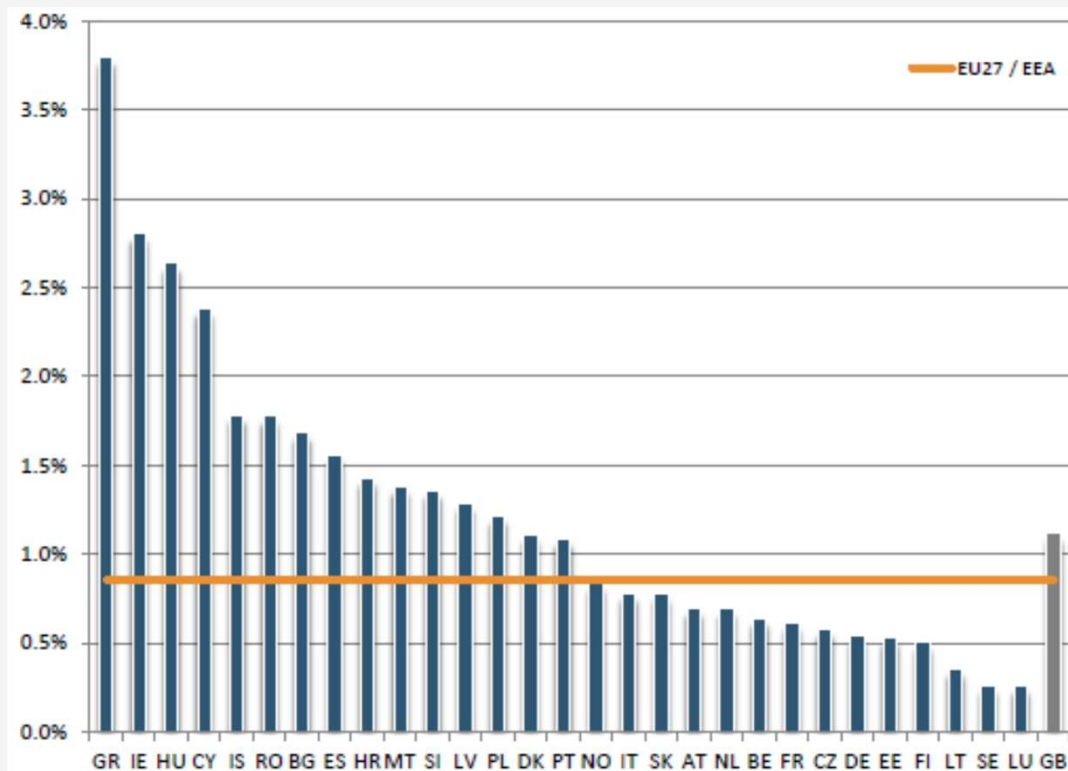


Source: S&P (2020), “Managing Through The Crisis, Europe’s Banks Look To The Future”, 28 Sep.

Pandemic

- The cost of risk (impairment flow/total loans) in Portugal is above the EU average.

Cost of Risk



Source: EBA (2020), "Risk Dashboard – As of 2Q 2020", Oct.

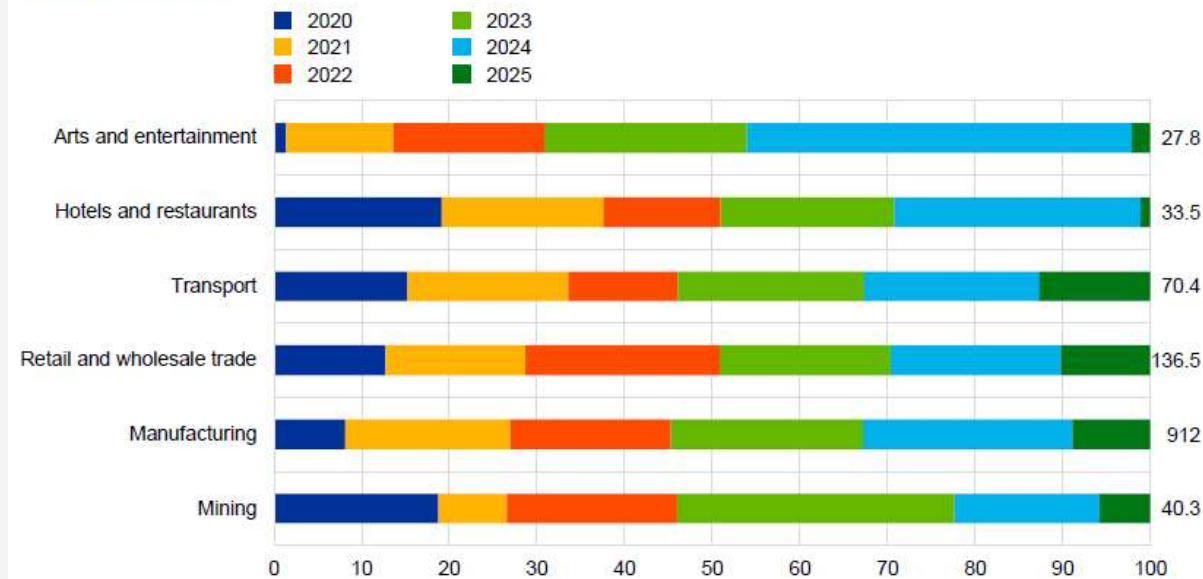
Pandemic

- Pandemic impacts severely on different sectors, facing substantial refinancing needs in the next future.

Sectors sensitive to the pandemic measures have substantial refinancing needs

Corporate refinancing needs in sensitive sectors over the next five years

(percentages, € billions)



Sources: Bloomberg and ECB calculations.

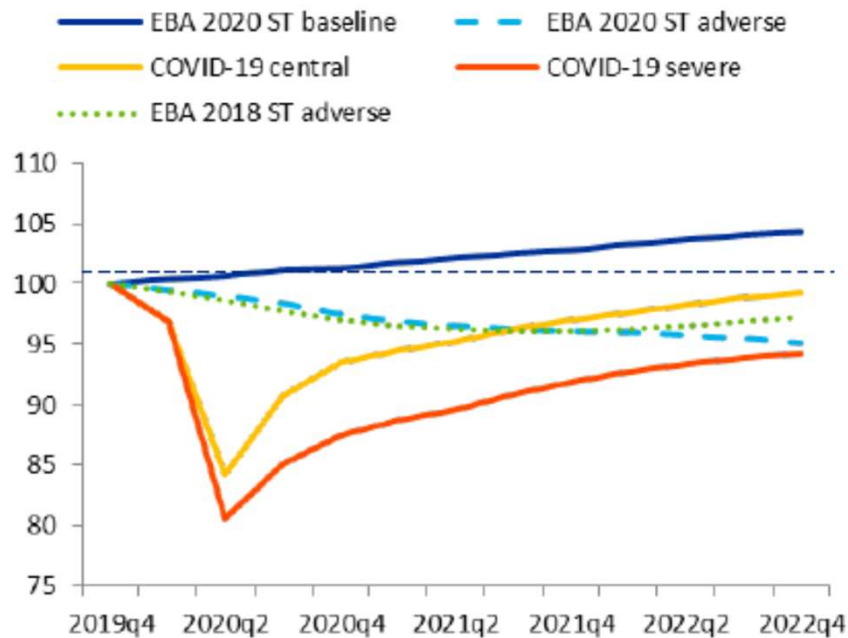
Note: The numbers on the right-hand scale are the cumulative refinancing needs over the next five years in € billions.

Source: Financial Stability Review, May 2020, European Central Bank.

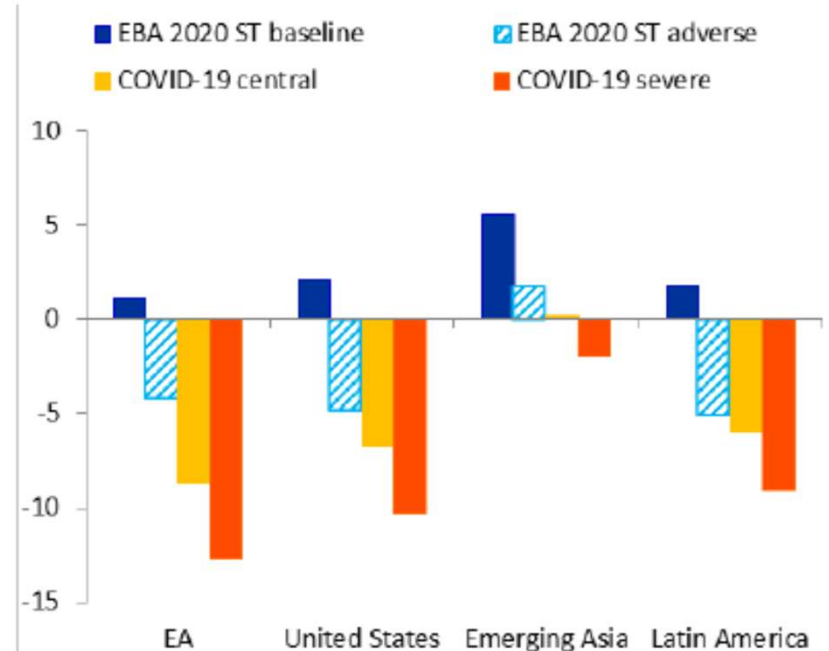
Pandemic

- Compared to the EBA Stress Test adverse scenarios, the COVID-19 scenarios considered by the ECB assume a harsher recession.

Real GDP: Euro area level (2019 = 100)



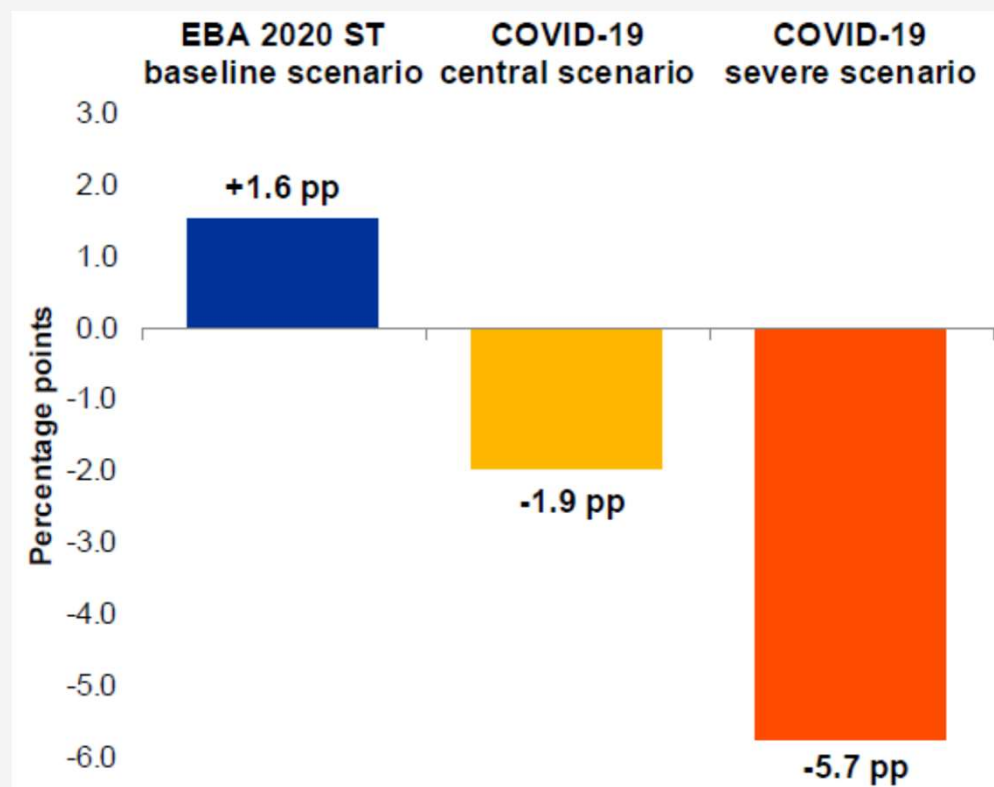
Real GDP: Maximum decline across regions (%)



Source: ECB (2020), “COVID-19 Vulnerability Analysis Results overview”, 28 July.

Pandemic

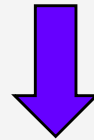
- Therefore, CET1 depletion levels are expected to be very significant, between 1.9 and 5.7 p.p. (central and severe scenarios, respectively).



Source: ECB (2020), “ COVID-19 Vulnerability Analysis Results overview”, 28 July.

Pandemic

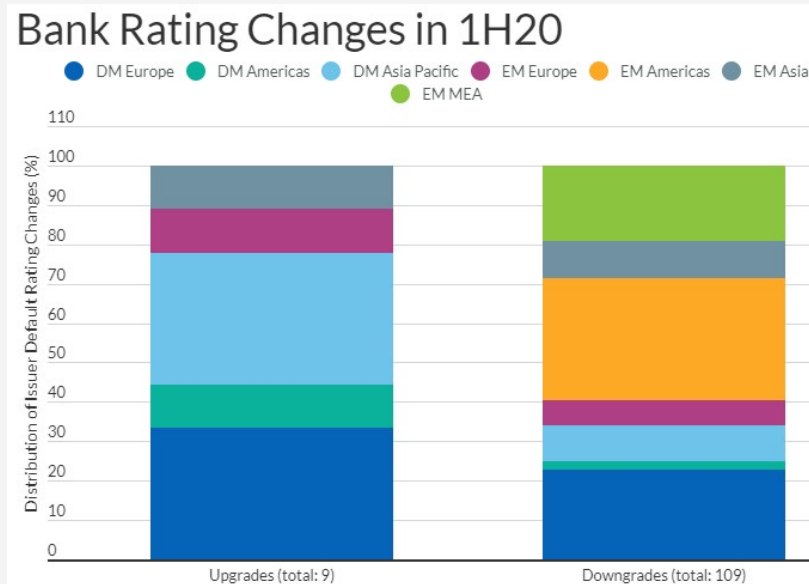
- **The banking sector will face deep restructuring, accelerating the pre pandemic trends**, with medium and small-sized banks suffering, as IT investments will be crucial in a persistently low interest environment, that will last for a longer period.



- This raises questions over the ability of some banks to survive the crisis and to generate and attract capital.
- **Consolidation will be an escape route, but BigTech companies have the chance to get a relevant role in the banking system**, as they have the technology, customer base and brand recognition, as well as vast amounts of data and cash, being much larger than banks.
- Conversely, banks benefit from the relationship lending as they keep lending to customers during the crisis, also benefiting from the access to deposit funding.

Pandemic

- **Perspectives about the future of the banking system have been deteriorating, namely in Europe.**
- Accordingly, **Fitch downgraded more than 100 banks during the 1st semester of 2020**, most of them based in emerging markets in the American continent and in developed markets in Europe.

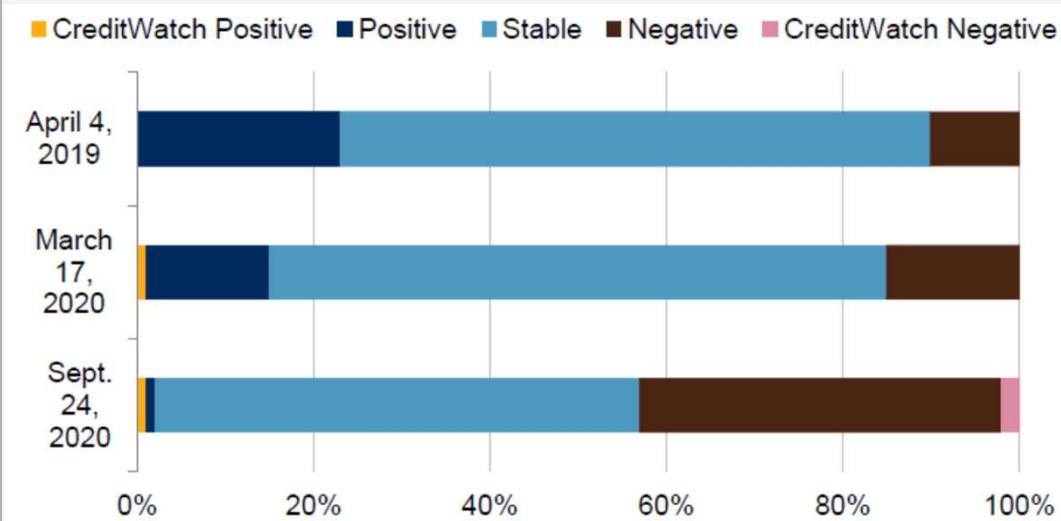


Source: Fitch Ratings

Source: Fitch Ratings (I2020), "Over 60% of Global Bank Rating Outlooks Are Negative", 7 Aug.

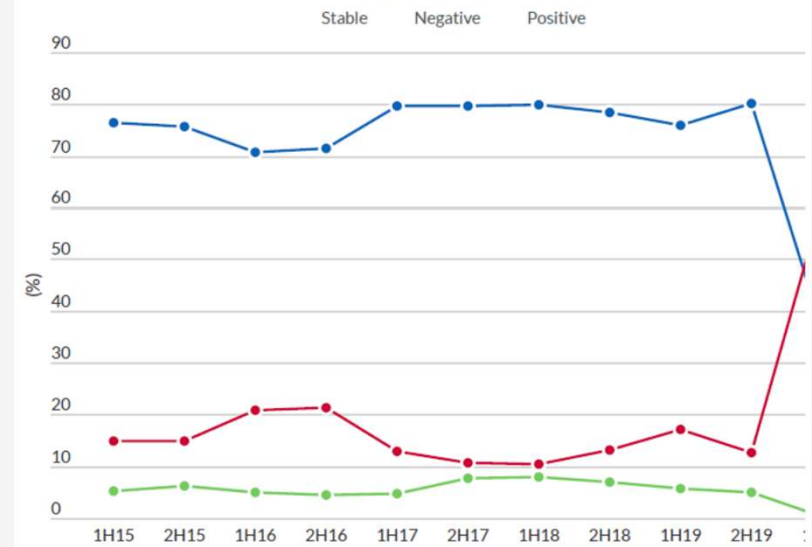
Pandemic

- Moreover, S&P placed around 45% of rating on larger European banks with negative outlooks, in line with Fitch Ratings worldwide.



Source: S&P (2020), “Managing Through The Crisis, Europe’s Banks Look To The Future”, 28 Sep.

Global Bank Rating Outlooks/Watches

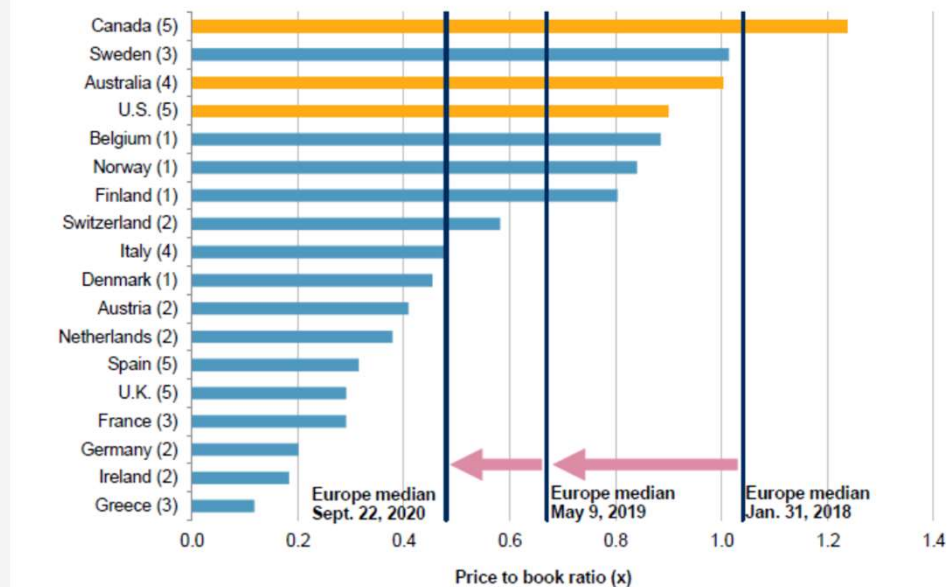


Source: Fitch Ratings (I2020), “Over 60% of Global Bank Rating Outlooks Are Negative”, 7 Aug.

Pandemic

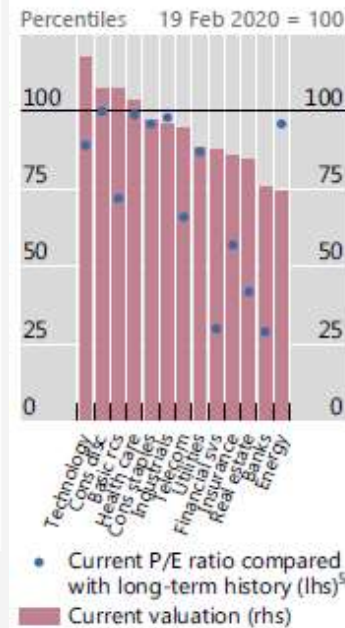
- **Price-to-Book Ratios of European Banks have also deteriorated sharply, with share prices falling by more than 40% during 2020, comparing adversely to other sectors.**

Price-To-Book Ratios Of Europe's Majors Continue To Lag Those Of More Profitable Peers



Source: S&P (2020), "Managing Through The Crisis, Europe's Banks Look To The Future", 28 Sep.

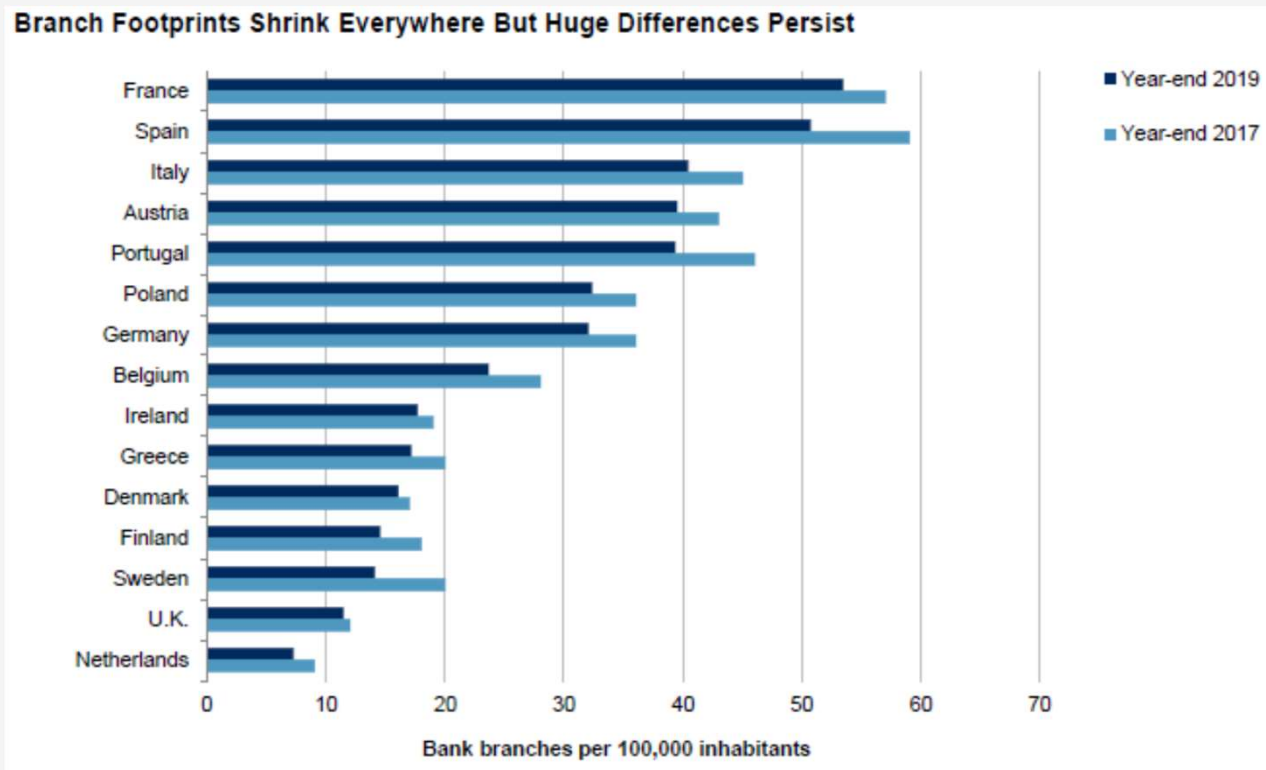
Sectoral performance diverges



BIS Quarterly Review (2020), "International banking and financial market developments", September.

Pandemic

- **One of the levers to improve profitability will be the digitalization, with the pandemic accelerating previous trends to reduce banks' footprint.**



Source: S&P (2020), “Managing Through The Crisis, Europe’s Banks Look To The Future”, 28 Sep.