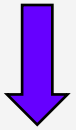
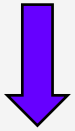
1.2. Systemic Risk

Excessive Debt

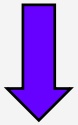
- Debt is socially useful => excessive debt is economic pollution



- More financial activity is not always beneficial



- Debt pollution must be constrained by public policy



- Build a less credit-intensive economy, to reduce systemic risk

Excessive Debt

- **Drivers of increasing debt:**

(i) Increasing importance of real estate in modern economies

- real estate accounts for more than 50% of all wealth and the vast majority of lending in advanced economies.

(ii) Increasing inequality

- poorer people tend to spend a higher proportion of their income and to borrow relatively more (e.g. subprime crisis).

(iii) Current-account imbalances

- have to be matched by the accumulation of debt.

Excessive Debt

- We need to understand:

(i) what is systemic risk

(ii) how to build a less credit-intensive economy; and

(iii) how can excessive credit be understood as pollution.

Systemic Risk

- The financial system is vulnerable to different types of shocks, either from outside the financial system or generated by the financial system itself.
- These shocks may be:

(i) Idiosyncratic – affect only a single institution,

(ii) Systemic - impact on the whole financial system (with risk of disruption of financial services) and the economy.

- **Systemic Risk** - the risk that the entire financial system may fail, causing a general economic collapse.
- **Systemic risk tends to be larger:**

(i) in more advanced countries, as the financial system play a larger role in these economies;

(ii) when economies are more intensively based on finance and are exporters of financial services.

Systemic Risk

- Even an idiosyncratic shock can lead to systemic risk, as:
  - (i) institutions are linked in several products and markets;
  - (ii) vulnerabilities may be common to different financial institutions
  - (iii) the sector credibility may decrease, triggering bank runs;
  - (iv) TBTF banks may be involved, impacting on the whole system.

- Bank failures are not uncommon and authorities have resolution tools for unwinding failed banks, aiming at avoiding contagion and banking services to be interrupted, i.e. systemic risk to materialize => systemic crises tend to happen once in a lifetime (e.g. 1929 crash, the subprime crisis in 2007/2008) => they are often understated and identified too late.

Systemic Risk

- **Systemic crises are often triggered by relatively small events, due to:**

(i) Inherent vulnerabilities – banking systems are fractional ⇔ banks just keep as reserves a fraction of their customers' deposits, lending more than the amount of deposits received and for larger maturities (maturity transformation).

(ii) Procyclicality - systemic risk tends to develop when reality suggests stability and low risk:

(a) economic expansions - banks have capital surpluses and economic prospects are better => higher lending demand and offer;

(b) economic recessions - capital decreases and economic prospects worsen => lower lending demand and offer.

Systemic Risk

(iii) Information asymmetry - Banks rely on the confidence of their depositors/counterparties and a loss of confidence can happen, as counterparties have less information ⇔ agency problem between counterparties and the bank => liquidity problems:

(a) A confidence crisis at a bank may result in a bank run and can quickly spread to other banks if they are perceived to share the same weaknesses;

(b) Counterparties may refuse to make new transactions or renew existing ones if they suspect a bank is in trouble.

(iv) Interdependence - Banks have multiple exposures to each other and the failure of an individual institution may cause spillovers to others.

(v) Perverse incentives – Government bail-outs may be needed, namely when large and very connected banks are at stake => banks have an incentive to become bigger, benefiting from lower cost of funding, due to the implicit Government support => moral hazard.

Systemic Risk

- **2 broad phases:**

(i) **build-up** - increasing financial imbalances, leverage (banks borrow to lend money, either from depositors or bond markets) and exuberance, with asset price misalignments, during periods when the economy is growing and stability seems to be ensured.

(ii) **materialisation** - shock transmitted due to the connections between FIs and to rapid deleveraging => fire sales (when financial institutions need liquidity and try to convert risky assets into cash, at a time when there are many sellers and few buyers => prices collapse, making it even harder to raise cash) and liquidity spirals (Brunnermeier (2009) and Krishnamurthy (2010)) => this behavior can cause a relatively irrelevant shock to become a systemic crisis.

- As emphasized in Danielsson (2013), "procyclicality is often created by the various amplification mechanisms built into the financial system, and is encouraged by risk-weighted capital, mark-to-market accounting and the fact that the strength of financial regulations tends to erode in boom times and come back with a vengeance during crises".

Systemic Risk

- **Key features of financial stress under crisis conditions:**

(i) increase in uncertainty (e.g., concerning asset valuations and the behaviour of other investors);

(ii) increase in disagreement (differences of opinion) among investors;

(iii) increase in the asymmetry of information between borrowers and lenders (intensifying problems of adverse selection and moral hazard);

(iv) reduced preference for holding risky assets (flight-to-quality) and/or illiquid assets (flight-to-liquidity), namely due to stronger risk aversion (Caballero and Krishnamurthy, 2008).

- **Observable symptoms of financial stress:**

(i) higher asset price volatility

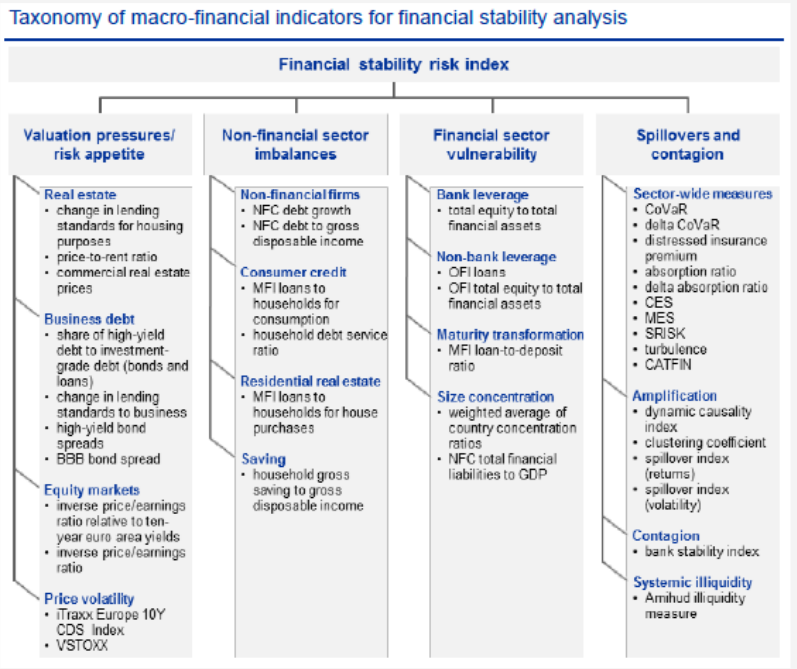
(ii) large asset valuation losses

(iii) wider default and liquidity risk premia.

Systemic Risk

- Systemic risk is very difficult to measure and forecast, having been the focus of abundant recent literature and being currently one of the priorities of regulators and supervisors.
- The measurement of systemic risk usually involves a large set of financial and macroeconomic indicators, though some indicators alone already provide relevant information.
- ESRB identified more than 2 dozen variables (as in UK and US), including:

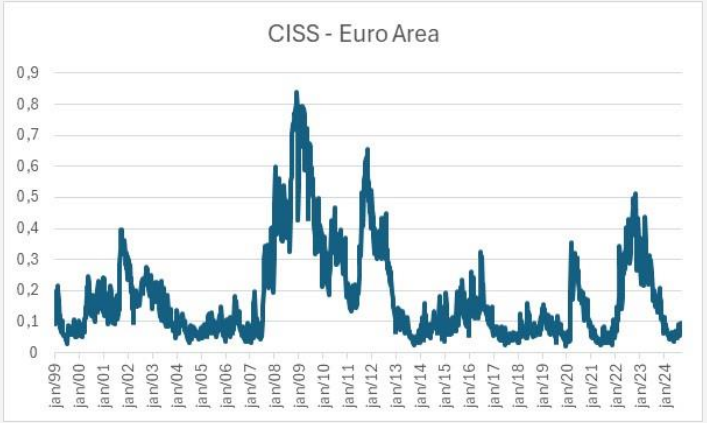
(i) Deviations in credit-to-GDP ratios
(ii) Change in price trends
(iii) Change in credit spreads
(iv) Credit risk



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

Systemic Risk

- One of the ECB indicators of systemic risk is CISS – Composite Index of Systemic Stress
  Holló, Dániel, Manfred Kremer and Marco Lo Duca (2012), "CISS – A Composite Indicator of Systemic Stress in the Financial System", WP No. 1426, Mar.
- It is based on the aggregation of 15 mostly market-based financial stress measures (standard financial market indicators, e.g. volatilities, risk spreads and valuation losses).
- These indicators are readily available for many countries on a daily basis and with long data histories, allowing the update in real time and calculation for a broad set of countries.
- **Problem: ability to anticipate events,** as they mostly react to financial stress events.



Source: ECB

Building a less credit-intensive economy

- Main tools:

(I) Monetary policy

(II) Microprudential rules

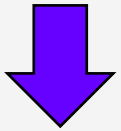
(III) Macroprudential policies

(IV) Holistic policies

Building a less credit-intensive economy

(I) Monetary policy:

- interest rate increases by central banks to tackle excessive credit growth, even before inflation is increasing – inflation measures only consider consumer prices and bubbles usually develop in real estate or stock markets, whose effects on consumer prices are not immediate;
- reserve requirements to limit banks' money creation ability;
- revision of the role of monetary policy and credit in money creation:
  - Reinforced mechanisms to channel liquidity to targeted economic activities.
  - Better balance between public and private money creation – printing more money (public money creation), under strict rules, may be better than excessive credit growth (private money creation).



Building a less credit-intensive economy

(II) Microprudential rules:

- **Higher capital requirements for banks**, namely during economic growth stages, are considered as beneficial, as they improve the prospects of financial stability, limiting credit expansion.
- Capital requirements are set to keep the system safe, by simply trying to make sure that individual banks are safe.
- But they can also impact adversely on the access to funding by debtors and consequently on the overall economic performance, as higher capital requirements for banks increase the cost of equity => higher cost of bank loans.
- However, according to Miles *et al*. (2012), even large increases in bank capital are likely to result in a small long-run impact on the borrowing costs faced by bank customers (e.g., if the amount of bank capital doubles, the average cost of bank funding will increase by only around 10–40 bps).

Higher Capital Requirements

- Moreover**, there are severe shortcomings of a shortage of banks' capital:**

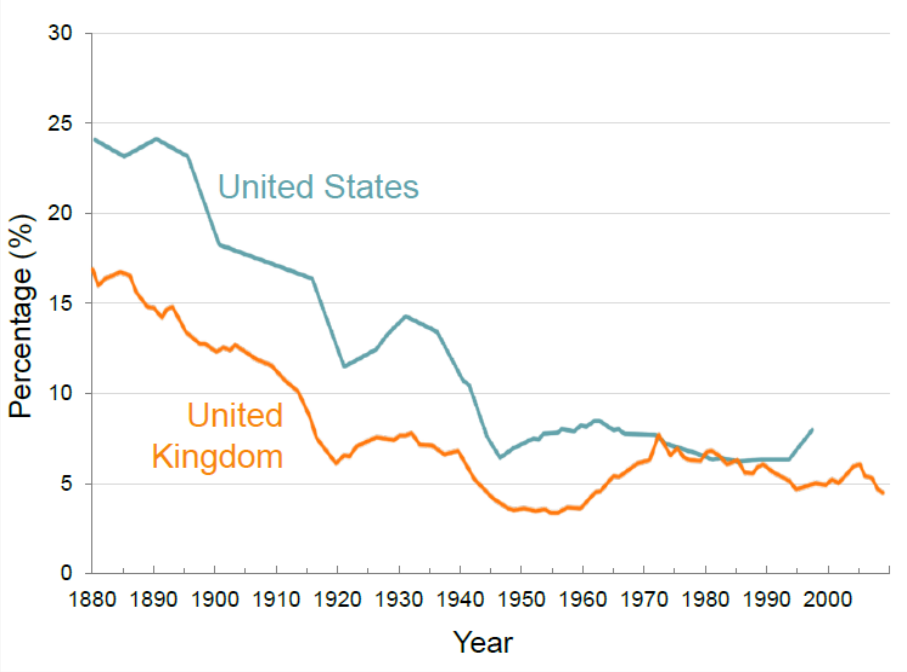
(i) undercapitalized banks are less able to supply credit to healthy borrowers;

(ii) weak banks are prone to evergreen loans to zombie firms, adding unpaid interest to a loan's principal and further undermining their already weak capital position to avoid the realization of losses;

(iii) the system as a whole becomes more vulnerable to contagion and panic.

Higher Capital Requirements

- Banks decreased very significantly their levels of capital vis-à-vis the volume of assets until the subprime crisis.



Source: Admati, Anat (2020), "Towards a Better Financial System", AEA Meetings, Economists for Inclusive Prosperity (EfIP) Session on Finance and Taxation, AEA Meetings, January 5.

Building a less credit-intensive economy

(III) Macroprudential policies:

- limits on LTV, DSTI or maturities:

(i) LTV = Loan-to-Value = Loan/Value of the property used as collateral: LTV+ => PD+ and LGD+

(PD - Probability of Default; LGD – Loss Given Default)

(ii) DSTI = Debt Service-to-Income = Installments / Income

(iii) Maximum limits on maturities, to avoid the debtor's age to overcome a given threshold at the loan maturity date.

- improvements on LTV and DSTI definitions:

(i) Installments definition - stressed and steady-state debt service definitions required (instead of the initial installment), something that started to be done only after the SSM launch;

(ii) Income definition - more comprehensive and harmonized definitions required, considering the expected permanent income (also after retirement, if the maturity exceeds the expected retirement date) and all debt obligations, living expenses, taxes and any anticipated expenditures.

- publication of financial stability reports.

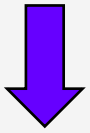
Building a less credit-intensive economy

(IV) Develop more holistic policies:

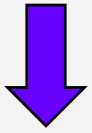
- Better rules on urban development - to mitigate excessive growth of real estate;
- Policies to reduce inequality;
- Taxation - to reduce the bias in favor of debt and against equity.

Excessive debt as pollution

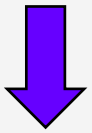
- Debt may be seen as pollution.
- Debt is unavoidable for the economy.



- **The problem is excessive debt.**



- **We need to identify the optimal amount of debt:**



- **Marginal social benefits of pollution-control = marginal private costs of control.**

Excessive debt as pollution

- **There is usually a preference for restrictions/prohibitions:**

(i) Size

- Entry barriers (e.g. higher minimum capital requirements to operate)?
- Economic barriers (e.g. impose a regulatory framework that demands a higher minimum size)?
- Quantitative Limits on credit?
- Higher capital requirements on certain classes of assets?

(ii) Scope

- Forbid retail banks to get involved in investment banking activities (Glass-Steagall Act, Dodd-Frank Act)?
- Segmented financial intermediation, instead of universal banking?

(iii) Macroprudential policies

- Impose limits to control quantities and risk – LTV, DTI, maximum maturities.

Excessive debt as pollution

- **Measures to reduce systemic risk:**

(1) Modularity - highly decentralised systems are less exposed to the TBTF problem.

(2) Robustness - keep it simple and act on the organisational form of the system, rather than through the participants => regulate the structure, more than the behaviour of individual market participants => macroprudential above microprudential supervision.

(3) Incentives - restrictions may provide the right incentives for banks to enhance financial stability, e.g. by imposing minimum capital requirements (and prohibiting banks to operate below these), banks have to increase their capital ratios => banks are safer => cost of capital and funding may be reduced.

Economies of Scale

- Definition: ability to decrease average costs by increasing size
- Imposing restrictions on the excessive growth of banks may impact on the ability of banks to reach a minimum optimal size.
- However, that doesn't seem to be a big issue, as economies of scale appear to exist in banks with relatively small size (assets much lower than 100 B$).
- According to studies in the mid-1990s, **economies of scale in banking are exhausted at relatively modest levels of assets, between 5-10 B$**.*
- A 2004 survey about the US and Europe found similar evidence.**
- Bank mergers - no strong evidence of increased efficiency after a merger or acquisition.

* Saunders, A.(1996), "Financial Institutions Management: A Modern Perspective", Irwin Professional Publishing and Berger, A- and L.Mester (1997), "Inside the Black Box: What Explains Differences in the Efficiencies of Financial Institutions?", Journal of Banking&Finance, vol.21(7), p.895-947.

** Amel, D, Barnes, C, Panetta, F and C Salleo (2004), "Consolidation and Efficiency in the Financial Sector: A Review of the International Evidence", *Journal of Banking & Finance, vol. 28(10).*

Economies of Scope

- Definition: ability to decrease average costs by enlarging the scope of activities.

- Evidence from US bank holding companies suggests that diversification gains from multiple business lines may be more than counter-balanced by heightened exposures to volatile income generating activities, such as trading.*

* Stiroh, K and A Rumble (2006), "The Dark Side of Diversification: the Case of US Financial Holding Companies", *Journal of Banking and Finance, Vol.80, p.2131-2161.*