

# Financial Regulation

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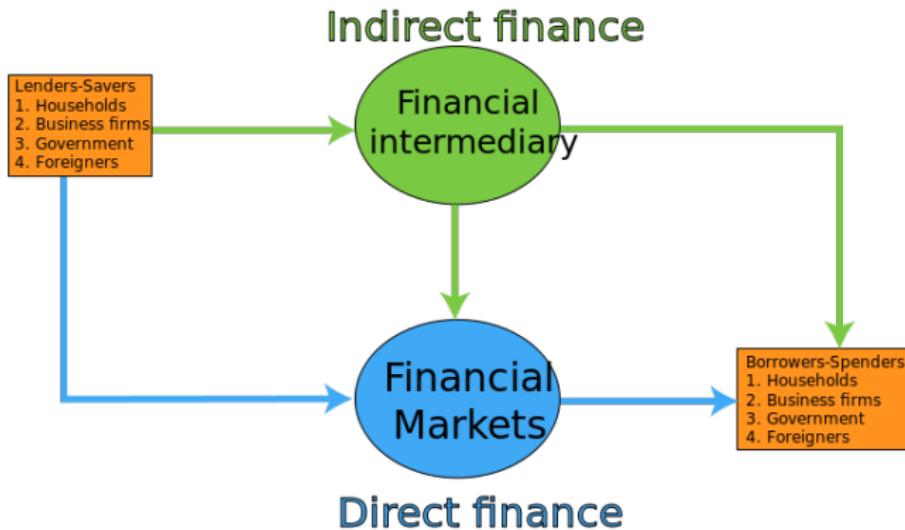
<sup>2</sup>These slides are published under the Gnu LGPL v3.0 license. Developed in collaboration with Esti Kemp. Many of these slides are based on the book "Regulating Wall Street" by Acharya, Cooley, Richardson, and Walter (2013). Please contact me under [cogeorg@gmail.com](mailto:cogeorg@gmail.com) if you have any comments or find mistakes in these slides. Perpetual work in progress.

## Day 1 Session 1

### Financial regulation - who and why?

## Who are financial intermediaries?

*... entities that acts as the middleman between two parties in a financial transaction, such as a commercial bank, investment banks, mutual funds and pension funds.*



# Financial intermediaries

## Examples

- ▶ Financial advisors
- ▶ Credit Union
- ▶ Mutual funds/Investment trusts
- ▶ Insurance Companies
- ▶ Pension funds
- ▶ Commercial banks
- ▶ Investment banks

## Financial intermediaries

- ▶ Transform assets
- ▶ Manage risks
- ▶ Process information and monitor borrowers
- ▶ Offer access to a payment system, public good

### Why care?

- ▶ Facilitate economic growth: mobilising savings so that consumption can be higher in the future as a result of investments made today.
- ▶ Global growth: Sending savings from countries with little room for further investment, to countries with more room than current savings can satisfy.

## Why regulate?

*"We regulate finance over and above the way we regulate other industries because finance exhibits market failures that can have devastating consequences"*

- ▶ financial market malfunction → the real economy ↓
- ▶ Example: Global financial crisis was triggered by problems in the US subprime mortgage market, but it led to German GDP shrinking by 6 percent in the first quarter of 2009 and the biggest drop in global trade since the 1930s.

## Why regulate?

Two principal drivers of market failures in finance that require regulation ....*there are others as well*

- ▶ Asymmetrical information
  - ▶ Consumer protection - balance the interests of unsophisticated consumers of financial products and their sophisticated sellers
- ▶ Social externalities
  - ▶ overall consequence of an activity is not captured by the private interests of those involved in the activity.
  - ▶ → internalise with social taxes? (Pigouvian response)
  - ▶ .. costs of financial system failures are  $>$  costs to the shareholders of a bank failure.  $\Rightarrow$  regulatory response: provide government insurance for depositors and higher capital requirements than banks would otherwise wish to hold

## Banks are different

- ▶ Banks accept *deposits*
- ▶ Banks lend to each other
  - ▶ Bank A may borrow from Bank B to lend one of its customers a loan to buy a car from a customer of Bank B....
    - why does this matter?
  - ▶ when one shoe shop fails it might be good for another shoe shop (they do not lend to each other)
  - ▶ Failure of one bank → undermine other banks
  - ▶ Bank runs
  - ▶ A single bank failure could lead to a collapse of the financial system

## Types of regulatory instruments

- ▶ ceilings on deposit interest rates
- ▶ restrictions on entry, size, and mergers
- ▶ investment restrictions
- ▶ deposit insurance
- ▶ capital requirements
- ▶ monitoring and bank supervision

## Tools for regulating the financial sector - grouped

1. Prudential regulation.
2. Resolution tools
3. Oversight of clearing and settlement systems.
4. Conduct of business regulation

Source: <https://www.imf.org/external/pubs/ft/wp/2009/wp0970.pdf>

## The Architecture of Financial Regulation

*“Optimum regulation is the art of balancing the immeasurable against the unknowable”*

# The Architecture of Financial Regulation

*“Optimum regulation is the art of balancing the immeasurable against the unknowable”*

There are four pillars of financial regulation:

- ▶ Encourage innovation and efficiency
- ▶ Provide transparency
- ▶ Ensure safety and soundness
- ▶ Promote competitiveness in global markets

## Limitations of Regulation

Limitations to regulating the financial system:

- ▶ Asymmetric information  
George Akerlof: Lemon's market
- ▶ Costly state verification  
Robert xTownsend: no disclosure until default, then full disclosure
- ▶ Missing markets  
Public goods: non-excludable/-diminishable/-rejectable



Yet the basic fact remains: every regulation represents a restriction of liberty, every regulation has a cost. That is why, like marriage (in the Prayer Book's words), regulation should not "be enterprised, nor taken in hand, unadvisedly, lightly, or wantonly"

— *Margaret Thatcher* —

AZ QUOTES

## Day 1 Session 1.2

### Alternatives to Regulation

## Alternatives to regulation

Alternative approaches to financial regulation:

- ▶ Laissez-faire modification [Preferred by Wall-Street]
- ▶ Glass-Steagall approach [Preferred by Interventionists]
- ▶ Carve outs
- ▶ Limit the size of financial conglomerates

1. Modification of laissez-faire approach:

  - ▶ Create appropriate tools for systemic risk regulation
  - ▶ Price implicit public subsidies
  - ▶ Create bankruptcy tools
2. Glass-Steagall approach:

  - ▶ Legacy investment banks are converted into bank holding companies
  - ▶ Reverts them into broker-dealer status
3. Carve outs:

  - ▶ Management of in-house hedge funds
  - ▶ Creation of off-balance-sheet affiliates
  - ▶ Large proprietary trading positions in cash securities and derivatives
  - ▶ Principal investors in non-financial activities
4. Limit the size of financial conglomerates that incorporate commercial banking units

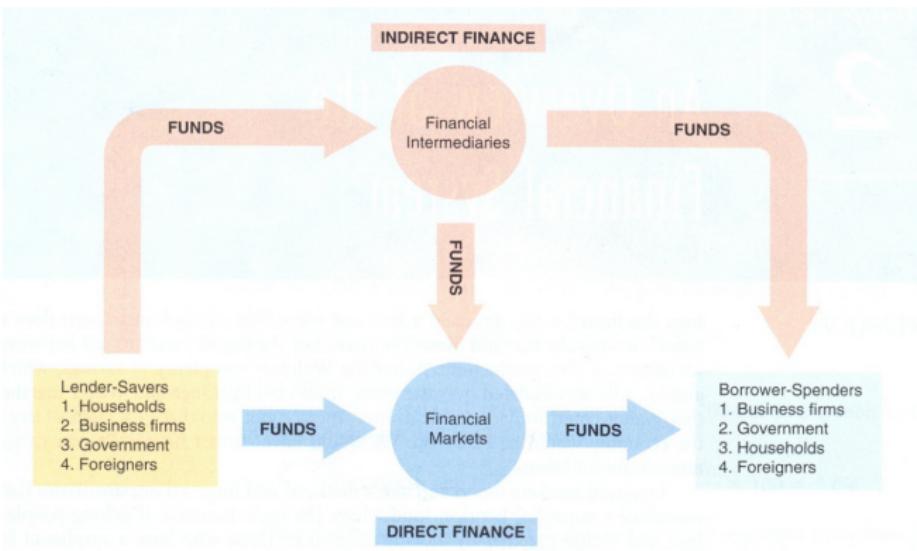
## Legislation

1. Dodd-Frank Wall-Street Reform and Consumer Protection Act:
  - ▶ Created new agencies to help regulate the system
  - ▶ Takes into account the four pillars in financial regulation
  - ▶ Prohibits lending to non-banking corporations
  - ▶ Allows for emergency lending only to participants in an economic program
  - ▶ **Fails to deal with shadow banking**
2. Consumer protection (BCFP):
  - ▶ Bureau of Consumer Financial Protection is funded by the Federal Reserve
  - ▶ Regulates credit cards, mortgages and retirement and insurance investments

Day 1 Session 2  
Financial intermediaries 1

## Financial Intermediaries and Market Failures in Financial Markets

# Recap: Financial Intermediaries



## Recap: Financial Intermediaries

### a) Reducing Transaction Costs

- ▶ FI have *economies of scale*:  
getting information about demanded and provided funds, assessing risks, bargaining, designing and enforcing contracts, buying/selling stock shares – these tasks can be accomplished by FI with much lower transaction costs by specialized information processing abilities, large transaction volumes, specific human capital (expertise)
- ▶ FI have *economies of scope*:  
FI provide additional services like risk diversification, optimizing portfolios, and consulting. Sometimes these services need the same infrastructure and the same human capital. Hence it *may* reduce cost when one FI provides these services.

## Recap: Financial Intermediaries

### b) Dealing with Risk:

- ▶ Risks: Investment projects may fail, borrowers may become insolvent.
- ▶ Reducing the risk by pooling them, reducing the risks arising from asymmetric information problems (see below).
- ▶ Reducing the risk by selling assets with different risk/return structures which are preferred by the lender/saver (asset transformation, e.g. time deposit, fund shares).
- ▶ Trading risky assets means that also risks are traded, all prices contain a “risk premium”.

## Recap: Financial Intermediaries

### c) Dealing with asymmetric information

- ▶ **Adverse Selection:**

- ▶ Hidden characteristics of a potential borrower (e.g.) before a contracting.
- ▶ Borrower knows his risk better than the lender.
- ▶ If lender offers a contract which is optimal for a borrower with average risks, this may be unattractive for those with good risks. This may result in a market failure.

- ▶ **Moral Hazard:**

- ▶ Hidden action of a borrower (e.g.) after contracting.
- ▶ Borrower takes the money to engage in a project that is undesirable for the lender. This reduces the probability for a successfully returned credit.
- ▶ FI may alleviate this problem e.g. by screening, collaterals, optimal design of contracts. Again, they have the resources to do that with low transaction costs.

## Recap: Financial Intermediaries

### Depository institutions (banks):

- ▶ Accept deposits from individuals and institutions as liabilities, providing loans and mortgages as assets.
- ▶ Example: Commercial banks, thrifts (saving and loans associations, mutual saving banks, credit unions).

### Contractual savings institutions:

- ▶ Accept premiums and contributions from government, firms and individuals as liabilities, investment in bonds, stocks and government securities.
- ▶ Example: life insurance, pension funds, retirement funds

### Investment intermediates:

- ▶ Selling commercial stocks, bonds or shares as liabilities, providing business loans and investment in stocks and bonds as assets.
- ▶ Example: Finance companies, mutual funds, private equity funds

## Recap: Financial Intermediaries

Type of FI	Primary Liabilities	Primary Assets	Value
<i>Depository Institutions</i>			
Commercial Bank	Deposits	Loans, mortgages, bonds	6141
Thrifts	Deposits	Mortgages, consumer loans	2240
<i>Contractual saving Institutions</i>			
Life Insurance Companies	premiums	Bonds, mortgages	3969
Fire/Caaaulty Insur. Comp.	premiums	bonds, stocks	1116
Pension funds	employer/employee contributions	bonds, stocks	4330
Gov. retirement funds	employer/employee contributions	bonds, stocks	2046
<i>Investment Intermediates</i>			
Finance Companies	commercial papers, stocks, bonds	loans	1385
Mutual Funds	issued shares	bonds, stocks	4969
Money market mutual funds	issued shares	money market instr.	1912

(US Data 2004 , Bill. Dollar, source: Mishkin (2006), Tables 1 and 2)

## Day 1 Session 3

### A Bank's balance sheet

## What is a balance sheet

- ▶ A summary of the assets and liabilities of a business (bank)
- ▶ A snapshot of assets and liabilities at a particular point in time
- ▶ A balance sheet always balances - double entry bookkeeping
  - ▶ Assets are *owned* by the bank
  - ▶ Liabilities are *owed* by the bank

# Banks as Financial Intermediaries

## *The Bank's Balance Sheet*

Assets	Liabilities
<ul style="list-style-type: none"><li>▶ Reserves (required, excess)</li><li>▶ Cash</li><li>▶ Securities/Bonds<ul style="list-style-type: none"><li>▶ firm bonds</li><li>▶ governmental bonds</li></ul></li><li>▶ Loans<ul style="list-style-type: none"><li>▶ industrial</li><li>▶ consumer</li><li>▶ real estate</li><li>▶ inter-bank</li><li>▶ other</li></ul></li><li>▶ Other assets (e.g. physical assets)</li></ul>	<ul style="list-style-type: none"><li>▶ (Checkable) Overnight deposits</li><li>▶ Nontransaction deposits<ul style="list-style-type: none"><li>▶ Time deposits</li><li>▶ Redeemable deposits (saving accounts)</li></ul></li><li>▶ Borrowings<ul style="list-style-type: none"><li>▶ Inter-bank loans</li><li>▶ Central bank loans</li><li>▶ Other</li></ul></li><li>▶ Bank Capital</li></ul>

# Stylised balance sheet - commercial bank

	<b>Assets</b>		<b>Liabilities and Equity</b>		<b>Liabilities</b>	
	Securities		Deposits	300	950	
	Cash and short-term		Senior secured debt			
	Trading book	250	Senior unsecured debt			
			Subord Jnr term debt	100		
			Debt + Loans	550		
			Hybrids	100		
<b>Off-balance sheet</b>	Total gross loans	500				
Forwards & futures	Less: Loan Loss Reserves	50				
Options	Total (Net)Loans	450	Preferred shares	10	Tier 1 Capital	
Swaps	Other Assets	200	Shareholders equity	40		50
250	Goodwill	100				
	<b>Total Assets</b>	<b>1000</b>	<b>Liability and Equity</b>	<b>1000</b>		
			Core capital (leverage)	50	5%	
	Risk-weight assets (RWA)	1500	Risk-based (Reg) Tier I	50	3%	
			Risk-based (Reg) Tier I +Tier II	250	17%	

## Commercial banks vs investment banks

	Commercial & Retail banks	Investment banks
Clients	General public	<ul style="list-style-type: none"><li>• Individuals</li><li>• Corporations</li><li>• Governments</li></ul>
Services	<ul style="list-style-type: none"><li>• Accepting deposits</li><li>• Providing loans and advances (Personal, business etc)</li><li>• Other basic investment products</li></ul>	<p>Assist clients in raising financial capital by underwriting or acting as the client's agent in the issuance of securities (or both)</p> <p>Could also assist with</p> <ul style="list-style-type: none"><li>• mergers and acquisitions,</li><li>• market making,</li><li>• equity securities,</li><li>• launch IPO services, etc.</li></ul>
Examples	<ul style="list-style-type: none"><li>▪ Barclays Bank</li><li>▪ Deutsche Bank</li></ul>	<ul style="list-style-type: none"><li>▪ Citigroup</li><li>▪ Morgan Stanley</li></ul>

Day 1 Sessions 4 and 5 Banks as financial intermediaries - Liquidity management, asset management and liability management and adverse selection

## Banks as financial intermediaries

### a) Liquidity Management

- ▶ For deposit outflows the bank needs liquid assets like cash or reserves.
- ▶ If there are not enough liquid positions on the asset side the bank needs expensive overnight loans or has to sell other assets, or it becomes illiquid. These are costs of deposit outflows.
- ▶ Problem: If customers receive a signal of liquidity problems they also wish to draw their deposits. This enforces the liquidity problem and may lead to bankruptcy.
- ▶ Liquidity management has to balance the liquidity of assets with the deposit position on the liability side. More generally: Given a probability distribution of inflows and outflows on the liability side, the asset side should be structured to meet the obligations to the depositors.

## Banks as financial intermediaries

- ▶ The higher the expected deposit outflows and/or the higher the cost of deposit outflows are the more excess reserves are required.

### b) Asset Management

- ▶ Management of risk and return of the assets (portfolio approach). Finding the mix of risky and riskless assets with the highest expected utility (assumption: risk aversion).
- ▶ The liquidity considerations (see a)) can be seen as an additional restriction to portfolio management.
- ▶ Portfolio theory is a core concept in (financial) economics. Details are given in the next subsection.

## Banks as financial intermediaries

### c) Liability management

- ▶ Deposits are not “given” and not the only source of funds.  
Decision how to acquire which types of liabilities.
- ▶ Differences of liabilities:
  - ▶ How fast could an additional liability be acquired?
  - ▶ Probability of outflows
  - ▶ Costs = interest rates (e.g. for time deposits, for inter-bank or central bank loans)
- ▶ Development of new financial instruments (e.g. certificates of deposits (CD) which are similar to bonds)

## Banks as financial intermediaries

### d) Bank Capital Management

- ▶ Most assets have risks: Credits may fail, bonds prices may fall. Hence, the value of the asset side is volatile.
- ▶ With a certain probability the losses of the asset side may exceed the bank capital: the bank becomes insolvent.
- ▶ Actual development: Large bank crisis in the USA in 2008. About 500 Billion Dollar asset values (especially housing loans and mortgages) had to be written off.
- ▶ The higher the bank capital (in percent of the liability side), the lower is the risk of insolvency.
- ▶ But: The return on equity (RoE) of the bank owners (return on assets / bank capital) is c.p. lower when the bank capital has a higher share of the liability side → trade-off!

## Adverse Selection Problems

### Information Asymmetries:

- ▶ before contracting: hidden characteristics → adverse selection
  - ▶ buying shares or bonds of a firm ⇒ characteristics are not known to the buyer
  - ▶ providing a loan to a borrower with unknown ability to pay back the loan (credit risk)
    - ⇒ decision is based on expectations about the characteristics
    - ⇒ expectations are built on prior and posterior information
    - ⇒ limited possibilities to reveal the unknown characteristics
    - ⇒ Pooling vs. Separating equilibria
- ▶ after contracting: hidden action → moral hazard

Firm uses the funds for financing projects which are more risky than indicated in the negotiation with the lender or buyer of a share. The latter can not observe this, but they can expect that there is an incentive for moral hazard.

## Adverse Selection Problems

### Markets for Lemons

- ▶ Akerlof, G.A. (1970), The Market for Lemons: Qualitative Uncertainty and the Market Mechanism. *Quarterly Journal of Economics* Vol. 84, 499-500.
- ▶ Wolfstetter, E. (1999), *Topics in Microeconomics*. (Chapter 9.2.1)

Nobel Prize 2001 to George A. Akerlof, A. Michael Spence, Joseph E. Stiglitz "for their analyses of markets with asymmetric information".

Foundation of market imperfections or market failures due to information asymmetries.

## Adverse Selection Problems

The original version: Market for used cars



"I agree, it's a lot of bang for the buck.  
And thumping, whining, clicking, clacking,  
clangng, grinding, buzzing and rattling."

## Market for used cars

- ▶ Cars have a different quality  $q$  (from “very good”  $q = b$  to “bad”  $q = 0$ , bad cars = “lemons”)
- ▶ The seller is privately informed about the quality  $q \in [0, b]$ .
- ▶ The seller will accept any price  $p \geq q$ .
- ▶ The buyer is willing to pay any price  $p \leq \alpha \cdot q$  with  $\alpha > 1$ .
- ▶ For any given  $q$  there exists a price  $\in [q, \alpha q]$  where buyer and seller mutually benefit from the deal.
- ▶ **But:** The buyer is not able to observe  $q$   
⇒ building expectations  $E[q]$ .

## Adverse Selection Problems

Assume that the quality  $q$  is *uniformly distributed* on  $[0, b]$ . This is known by the buyer. For any used car the expected quality is hence  $E[q] = b/2$ . Therefore

$$p(E[q]) \leq \alpha \cdot \frac{b}{2}$$

Two cases:

- ▶ Case 1:  $\alpha \geq 2$ . Then the buyer is willing to pay  $p \geq b$  and all cars will be sold.
- ▶ Case 2:  $1 < \alpha < 2$ . Then the market breaks down!

## Adverse Selection Problems

Market breakdown:

- ▶ For  $\alpha < 2$  the buyer will never pay  $p = b$ .
- ▶ No high quality cars ( $q = b$ ) will be sold. They can be removed from the interval (e.g.  $q \in [0, b - \epsilon]$ ).
- ▶ This can be anticipated by the buyer. The expected average quality decreases (e.g.  $E[q] = (b - \epsilon)/2$ ).
- ▶ The willingness to pay also decreases.
- ▶ The remaining best quality cars leave the market.
- ▶ and so forth... (“race to the bottom”)

## Adverse Selection Problems

Or in another way:

- ▶ Assume an arbitrary market price  $p > 0$ . Obviously there are only sellers in the market with  $q_i \in [0, p]$ . The average quality is hence  $E[q] = \frac{p}{2}$ .
- ▶ This is known by the buyers. They are willing to pay maximum  $p(E[q]) = \alpha/2 \cdot p$ .
- ▶ For  $\alpha < 2$  this is lower than the market price and no deal comes about.

## Adverse Selection Problems

### Financial Markets:

- ▶ Firm needs funds to finance a risky project. The funds can be obtained by debt or equity. Assume that the firm demands for a loan  $L$ .
- ▶ The (risk neutral) firm is willing to pay an interest rate  $i_L$  which does not exceed the expected return of the project  $r$ .
- ▶ The bank will provide the loan  $L$  when the interest rate covers at least the interest rate for a secure asset  $i_S$  plus the risk premium  $RP$ .
- ▶ Assume that the loan is either returned successfully with probability  $1 - p$  or it fails completely with probability  $p$ . The minimum risk premium is therefore:

$$L(1 + i_S) = L(1 + i_L)(1 - p) + 0 \cdot p \quad (1)$$

$$\Rightarrow RP = i_L - i_S = \frac{p}{1 - p}(1 + i_S) \quad (2)$$

## Adverse Selection Problems

- ▶ Problem:  $p$  is *private information* of the firm = not known by the bank!
- ▶ Offering a loan contract with an interest rate  $i_L$  (and risk premium) based on the *expected* probability  $E[p]$  taken from a prior distribution of risks.
- ▶ Typically the expected return and the risk of investment projects are positively correlated. Firms with *profitable low risk projects* with

$$r < i_S + \frac{E[p]}{(1 - E[p])}(1 + i_S)$$

will not get a loan contract!

- ▶ The remaining projects are hence more risky which leads to an increase of  $E[p] \Rightarrow$  a similar mechanism as in the “market for lemons” example applies.

## Adverse Selection Problems

### Credit Rationing:

Adverse Selection Effect: With an increasing interest rate more and more good (= low risk) projects leave the market and the expected risk increases:

$$E[p] = E[p(i_L)], \quad \frac{dE[p(i_L)]}{di_L} > 0$$

Profit maximizing bank:

$$\max_{i_L} \pi = (1 - E[p(i_L)])(1 + i_L)L \quad (3)$$

$$\Rightarrow \frac{d\pi}{di_L} = -\frac{dE[p(i_L)]}{di_L}(1 + i_L)L + (1 - E[p(i_L)])L = 0 \quad (4)$$

$$\Rightarrow i_L^* = \frac{(1 - E[p(i_L)]) - \frac{dE[p(i_L)]}{di_L}}{\frac{dE[p(i_L)]}{di_L}} \quad (5)$$

## Adverse Selection Problems

What are the consequences?

- ▶ The profits do not monotonously increase with market interest rate  $i_L$ .
- ▶ If loans demand increases *there is not necessarily a Walrasian adjustment of the equilibrium interest rate!*
- ▶ The demand side of the loans market will be rationed.
- ▶ Existence of *rationing equilibria*.
- ▶ The notional plans of the firms cannot be fulfilled  
⇒ spillover to other markets
  - ▶ e.g. markets for bonds or equities to finance the project
  - ▶ e.g. markets for investment goods

## Adverse Selection Problems

Literature:

- ▶ Stiglitz, J., Weiss, A. (1981), Credit Rationing in Markets with Imperfect Information. *American Economic Review* 71, 393-410.
- ▶ Greenwald, B., Stiglitz, J., Weiss, A. (1984), Information Imperfections in the Capital Market and Macroeconomic Fluctuations. *American Economic Review* 74, 194-199.

Note:

- ▶ The problem of rationing may be (partially) overcome e.g. by collaterals.
- ▶ The problem may also occur in bonds and stock markets: The price which the initial buyer is willing to pay reflects his uncertainty about the risk type of the firm!

## Adverse Selection Problems

There are different ways how to solve or to alleviate the problem:

- ▶ Providing better information = decreasing information asymmetry
  - ▶ *Screening*: The less informed agent has an incentive
    - ▶ to collect information by himself
    - ▶ to buy additional information supplied by other agents
    - ▶ to provide different contracts with self-selection effects
  - ▶ *Signalling*: The privately informed agent has an incentive to provide a trustworthy (costly) signal about his characteristics.
  - ▶ *Governmental Regulation*
- ▶ Collateral and Net Worth

The information asymmetry is not resolved but has minor consequences since in case of a failed project the return of the loan do not fail.

## Adverse Selection Problems

### Screening by collecting information

- ▶ High information costs, especially for lenders with low expertise.
- ▶ Bank as a financial intermediate with expertise and specialized human capital reduces such information costs:
  - ▶ Multiple lender of funds ⇒ bank deposits
  - ▶ Bank is pooling the risks and guarantees the depositor an interest rate
  - ▶ Screening costs of multiple non-specialized lenders are reduced and transferred to the bank
  - ▶ The bank as the intermediate lender faces a lower information asymmetry
- ▶ The existence of a professional banking system is a prerequisite for a working credit market (crucial for developing countries).

## Adverse Selection Problems

### Screening by buying information provided by others

- ▶ Rating agencies (e.g. Standard & Poors, Moody): (Large) Borrowers are rated according to a standardized scale (see Mishkin (2006), chapter 6, p.123)

### Problems:

- ▶ *Free-rider problem* since information is a non-rival good. Once, when information is made public, there is no incentive anymore to pay for it.
- ▶ How *trustworthy* is that information? Moral Hazard problem of information providing institutions since the customer (e.g. bank) is not able to asses the reliability of the information.

## Adverse Selection Problems

### Governmental Regulation:

If investors need financial funds, e.g. by demanding credits or selling bonds or stocks, they can be forced by law to provide some information to reduce the information asymmetry. E.g.

- ▶ adhere standard accounting principles
- ▶ providing information about the balance sheet and other (financial) indicators like sales, earnings, assets
- ▶ in case of stock markets: publish relevant informations regularly, annual meeting of shareholders etc.

## Adverse Selection Problems

### Signalling:

- ▶ A firm with a low risk project has an incentive to provide a signal so that the lender is informed about the low risk (and charging a low risk premium).
- ▶ If signalling should make sense...
  - (a) the signal must be costly
  - (b) there must exist signals that are too expensive for a high risk firm but not too expensive for low risk firms  $\Rightarrow$  discrimination is possible.
- ▶ Otherwise high risk firms have an incentive to *imitate* the signal so that signalling provides no information (pooling equilibrium).

## Adverse Selection Problems

Signalling means “building reputation”. Reputation signals (e.g.):

- ▶ Loans have been successfully returned in the past.
- ▶ Projects are financed also with equity capital.
- ▶ Firm provides voluntarily more sensitive information than required by law.
- ▶ Firm has valuable assets (→ similar to collaterals).

This may be a problem for new and small firms.

## Adverse Selection Problems

### Collaterals:

- ▶ In case of failure of the investment project the investor has other assets which can be sold to meet the debt obligations.
- ▶ The borrower must prove that he has such collaterals before signing the credit contract.
- ▶ The credit contract may include the obligation that a certain asset must not be sold before the credit is returned successfully.
- ▶ The credit contract includes that lender automatically becomes the owner of an asset in case of a credit failure.
- ▶ The credit contract includes that the lender has property rights on the asset which are returned to the borrower in case of a successfully returned credit ⇒ mortgages (e.g. in case of housing, real estate)

## Adverse Selection Problems

Collaterals  $C$  lower the risk premium:

$$L(1 + i_S) = L(1 + i_L)(1 - p) + pC \quad (6)$$

$$\Rightarrow RP = i_L - i_S = \frac{p}{1-p}(1 + i_S) - \frac{p}{1-p} \frac{C}{L} \quad (7)$$

with  $C = \arg \max\{0, (1 + i_S)L\}$ . In case of  $C = L(1 + i_S)$  there is no credit risk for the lender anymore.

### Problems:

- ▶ Providing collaterals is costly (e.g. opportunity costs).
- ▶ The access to collaterals is limited (e.g. start-up companies).
- ▶ The value of collaterals may be uncertain (see the recent housing crisis in the U.S. – dramatic decrease of house prices = decrease of the value of collaterals)

## Adverse Selection Problems

Literature on Collaterals:

- ▶ Bester, H. (1985), Rationing in Credit Market with Imperfect Information. *American Economic Review* 75, 850-855.
- ▶ Besanko, D., Thakor, A. V. (1987), Collateral and Rationing: Sorting Equilibria in Monopolistic and Competitive Credit Markets. *International Economic Review* 28, 671-689.

## Day 1 Session 6

### History of US banks and establishing the US Fed

## US banks

- ▶ No American banks as late as 1781
- ▶ Alexander Hamilton writes to Congress's superintendent of finance, Robert Morris, that "*Most commercial nations have found it necessary to institute banks and they have proved to be the happiest engines that ever were invented for advancing trade.*" . Hamilton recommended that a bank be founded.
- ▶ Morris persuaded Congress to charter the new nation's first bank, *the Bank of North America* located in Philadelphia in 1782.
- ▶ Three years later, Boston merchants founded the Massachusetts Bank and Hamilton became a founder of the Bank of New York.
- ▶ The irony: establishment of the *First Bank of the United States* in 1791

## US banks ... continued

- ▶ First Bank of the United States was opposed for being unconstitutional
- ▶ many fearing that it relegated undue powers to the federal government ⇒ its charter was not renewed in 1811
- ▶ War of 1812 ⇒ government turning to state banks for finance... followed by over-expansion of credit
- ▶ financial order needed to be reinstated
- ▶ obtaining an official legislative charter was highly political

## Era of free banking

- ▶ A new era of “free banking” emerged with a number of states passing laws in 1837 that abolished the requirement to obtain an officially legislated charter to operate a bank, and by 1860, a majority of states had issued such laws.
  - ▶ Anyone could operate a bank, one of the conditions was that all notes issued were back by proper security
  - ▶ still it did not guarantee immediate redemption in specie (gold or silver)
  - ▶ era of free banking suffered from financial instability with several banking crises occurring
  - ▶ a disorderly currency characterized by thousands of different bank notes circulating at varying discount rates
- ⇒ The free banking era - characterized as it was by a complete lack of federal control and regulation - came to an end with the National Banking Act of 1863

- ▶ National Banking Act of 1863 aimed to replace the old state banks with nationally chartered ones.
- ▶ Office of the Comptroller of the Currency (OCC) was created to issue these new bank charters as well oversee that national banks maintained the requirement to back all note issuance with holdings of US government securities
- ▶ new national banking system helped return the country to a more uniform and secure currency
- ▶ growing complexity of the U.S. economy highlighted the inadequacy of an inelastic currency
- ▶ frequent financial panics occurring throughout the rest of the nineteenth century
- ▶ occurrence of the bank panic of 1907, it had become apparent that America's banking system was out of date

## Establishing the US Fed

- ▶ Congress created a new central bank, the Federal Reserve System (Fed) in 1913, after three-quarters of a century without a central bank - a period punctuated by a number of banking crises.
- ▶ by end 1914 the twelve regional Reserve Banks, coordinated by the Federal Reserve Board in Washington, DC, were open for business.



Day 2 Session 1  
History of US legislation

## History of US legislation

FIs today specialize in a certain type of activity, but this has not always been the case. It was not until after the crash of 1929 that these two types of banking began to operate separately.

## Background to US regulatory changes - Leading up to 1929

- ▶ Roaring Twenties
  - ▶ Unprecedented economic boom in the US
  - ▶ Mass production in manufacturing, telecommunication, movie and chemical sectors
  - ▶ Population moved into cities to acquire jobs in these industries
  - ▶ Americans - cash flush - invest in the stock market and deposit into banks
  - ▶ Banks were opening at a rate of 4-5 per day (!)

## Stock market crash of 1929: DJT© Stock Index



SNIPER Market Timing - 2007 - <http://www.sniper.at>

## Background to US regulatory changes - The Great Depression (1929 - 1941)

- ▶ 1929 stock market crash
  - ▶ Stock market peaked on 3 Sept 1929
  - ▶ 29 October 1929 - 40 per cent down. → Black Tuesday.  
Investors lost 14 billion dollars in a single day.
- ▶ Banks
  - ▶ Banks lent money to investors to buy stock
  - ▶ Margin requirements were low
  - ▶ Banks were allowed to speculate and buy stocks for themselves
  - ▶ → The crash put a lot of pressure on banks

## Background to US regulatory changes - The Great Depression (1929 - 1941)

Once the selling began, more selling was needed to satisfy margin calls and liquidity requirements for banks....

- ▶ Bank runs
  - ▶ No guarantees on cash at the bank
  - ▶ People feared that their bank would collapse
  - ▶ Some banks were not able to fulfill the requests for withdrawal and closed their doors to people
  - ▶ ↓ lending to businesses and consumers
  - ▶ → more people need to withdraw money
  - ▶ paper money was backed by gold
  - ▶ people kept money under their mattresses



## The US Federal Reserve and the Great Depression

- ▶ The government began to increase interest rates, in 1929, from 3.5% to 5%.
- ▶ Money supply not stabilised - supply fell by 30% between 1929 and 1933
- ▶ prices dropped
- ▶ banks failed
- ▶ ⇒ deflation
- ▶ ⇒ No confidence in banking sector
- ▶ Focus was on maintaining the gold standard - sufficient gold reserves to meet the demands of the depositor, and adequate demand for currency

## Great Depression Effects on the Economy

- ▶ **Higher unemployment** By 1933, the unemployment rate had climbed from 3% to 25%
- ▶ **Lower income** On average incomes were reduced by 40 %
- ▶ **Deflation**
- ▶ **Increased foreclosures** By 1934, nearly one-half of all residential loans were delinquent and over 1 million families lost their farms
- ▶ **Banks close** In 1933 alone, more than 4 000 banks closed
- ▶ **Hollywood** actually did very well during this period of time - the Hollywood film industry. It is thought that people went to the movies because, for a brief time while at the movie, they could forget their many hardships :)

## Bank Holiday of 1933

An effort to stem bank failures and ultimately restore confidence in the financial system

- ▶ 36 hours after taking office in March 1933, President Roosevelt ordered the suspension of all banking transactions, effective immediately
- ▶ For an entire week, Americans would have no access to banks or banking services.
- ▶ Before banks could reopen, there needed to be agreement on whether or not to “weaken the link between gold and note issue” (Meltzer 2003, 423)
- ▶ The crisis began to subside on 9 March, when Congress passed the Emergency Banking Act.
- ▶ On March 13, member banks in Federal Reserve cities received permission to reopen.
- ▶ By March 15, banks controlling 90% percent of the country's banking resources had resumed operations and deposits far exceeded withdrawals.... the worst of the banking crisis seemed to be over.

## Policy changes during the great depression

Role of the US Government changed dramatically

- ▶ Banking Act of 1933
  - ▶ Glass-Stegall Act - breaks connection between commercial and investment banks
  - ▶ Federal Deposit Insurance Corporation (FDIC) - insure bank deposits
  - ▶ Regulation Q - outlawed the payment of interest on checking accounts and also placed ceilings on the amount of interest that could be paid on other deposits
- ▶ 1933: The US goes off the gold standard
- ▶ 1934: Securities and Exchange Act - helped to police activities related to the selling of securities
- ▶ 1935: Social Security Act - assistance to the unemployed, handicapped and elderly
- ▶ Banking Act of 1935 - fully insured balances up to \$5,000 and provided no insurance for balances above that amount

# President Franklin D. Roosevelt signs the Glass-Steagall banking bill in 1933



## Banking Act of 1933

At the time it was legislated, and for several decades thereafter, the Banking Act of 1933 reflected in some measure a sound economic approach to regulation in case of market failure:

- ▶ *Identify the market failure*, or in other words, why the collective outcome of individual economic agents and institutions does not lead to socially efficient outcomes, which in this case reflected the financial fragility induced by depositor runs.
- ▶ *Address the market failure through a government intervention*, in this case by insuring retail depositors against losses.
- ▶ *Recognize and contain the direct costs of intervention, as well as the indirect costs due to moral hazard arising from the intervention*, by charging banks up-front premiums for deposit insurance, restricting them from riskier and more cyclical investment banking activities, and, through subsequent enhancements, requiring that troubled banks face a “prompt corrective action” that would bring about their orderly resolution at an early stage of their distress.

Getting rid of Glass-Steagall

## Glass-Steagall recap

Over time, the term Glass–Steagall Act came to be used most often to refer to four provisions of the 1933 Banking Act that separated commercial banking from investment banking.

- ▶ Glass-Steagall Act is a law that prevented banks from using depositors' funds for risky investments (stock market)  
⇒ Separated investment banking from retail banking
- ▶ Institutions were given one year to decide whether they wanted to specialize in commercial or investment banking.
- ▶ Glass-Steagall was enacted as an emergency response

# Glass-Steagall recap

## GLASS-STEAGALL

SEPARATE LEGITIMATE COMMERCIAL BANKING  
from SPECULATIVE INVESTMENT FUNCTIONS



Under Glass-Steagall standards all banking institutions are forced to choose between either commercial or investment banking.

Productive functions of banks will be federally protected, while other, worthless, speculative functions are left out to dry.

### NEW GLASS-STEAGALL LEGISLATION

DERIVATIVES

CARBON SWAPS  
CDO's & MBS's

EXOTIC INSTRUMENTS

INFRASTRUCTURE  
LOANS TO SM. BUSINESS

MORTGAGES  
PENSIONS



ALL SPECULATIVE ACTIVITY  
MUST BE PURGED FROM OUR  
ECONOMIC SYSTEM

&

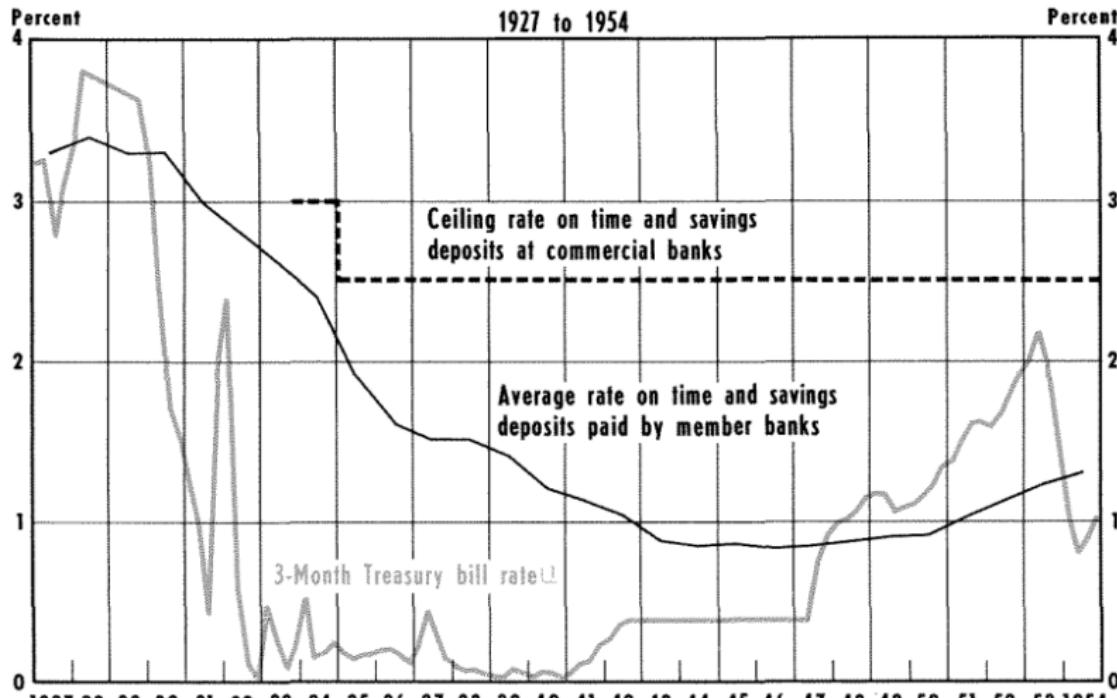
VITAL COMMERCIAL AND  
DEPOSIT BANKING FUNCTIONS  
ARE PROTECTED



## **Justification of the rate ceilings - Regulation Q**

- ▶ **Shield bank profits by limiting the competition for deposits** View: competition for deposits not only reduced bank profits by raising interest expenses, but also could cause banks to seek riskier investments and make high risk loans in order to cover the costs.
- ▶ **Encourage country banks to lend more in their local communities** rather than hold balances with larger banks in financial centers.
- ▶ **Deposit interest rate ceiling would compensate banks for the costs incurred by the newly introduced deposit insurance premiums**
- ▶ **Ceilings were extended to thrift institutions** such as mutual savings banks, savings and loan associations in 1966 - policymakers believed that competition for deposits between commercial banks and thrifts as one of the reasons of the rise in residential mortgage interest rates and the subsequent slowdown in lending growth

## Interest Rates and the Ceiling Rates on Time and Savings Deposits



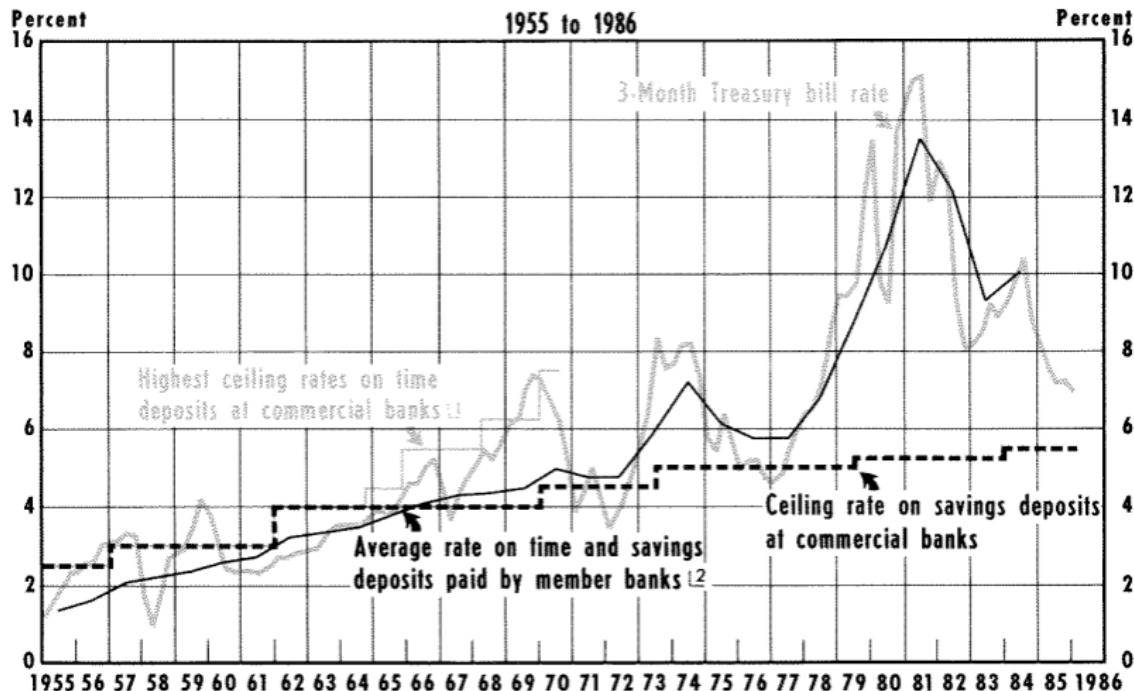
NOTE: All data are quarterly except the average rate paid on time and savings deposits which is an annual series.

① Before 1934, the Treasury bill rate includes 3- to 6-month notes and certificates.

## Issues with Glass-Steagall

- ▶ Limiting deposit interest rate competition through rate limitations
- ▶ Restricting competition for deposits based on financial strength by insuring depositors
- ▶ Critics argued that Regulation Q's limits on interest rates created the "disintermediation" that began in the 1960s
- ▶ Allowed commercial banks to earn high profits until nonbanking companies found ways to offer substitutes for bank loans and deposits...
- ▶ ... Over time, Regulation Q made bank deposits less attractive relative to other savings products and helped boost fund industry growth, particularly, money market mutual funds.
- ▶ ⇒ the development of substitutes to bank deposits

## Interest Rates and the Ceiling Rates on Time and Savings Deposits



NOTE: All data are quarterly except the average rate paid on time and savings deposits which is an annual series.

[1] At least some categories of time deposits in denominations of \$100,000 or more have been exempt from ceiling rates since June 24, 1970.

[2] After 1971, the average interest rate is for all insured commercial banks.

Source: Gilbert, 1986

## Deregulation

- ▶ Monetary Control Act (MCA) of 1980 - established the Depository Institutions Deregulation Committee (DIDC), main duty - phase out the regulation over a period of 6 years. MCA contained several provisions relating to bank reserve and deposit requirements. It created the popular Negotiable Order of Withdrawal (NOW) accounts and also raised the amount of FDIC insurance protection from \$40,000 to \$100,000 per account.
  - ▶ deregulation of interest rates paid by depository institutions such as banks
  - ▶ opened the Fed discount window
  - ▶ extended reserve requirements to all domestic banks
- ▶ Glass-Steagall was repealed in 1999 by the Gramm-Leach-Bliley Act.

## Bank disintermediation

The term “banking disintermediation” refers to a situation where

- ▶ banks no longer hold the loans they originated on their balance sheets but sell them off;
- ▶ borrowers go directly to the capital markets rather than to banks to obtain a credit; or
- ▶ savers invest directly in securities, such as government and private bonds, asset-backed securities, stocks, rather than leaving their money in savings accounts on banks' balance sheets

These trends began to emerge in the US in the 1980s- 1990s.

However, there is no simple and univocal explanation to the process of disintermediation. It has resulted from a series of interdependent events, regulatory changes, policy decisions, historic events, macroeconomic conditions and cultural factors.

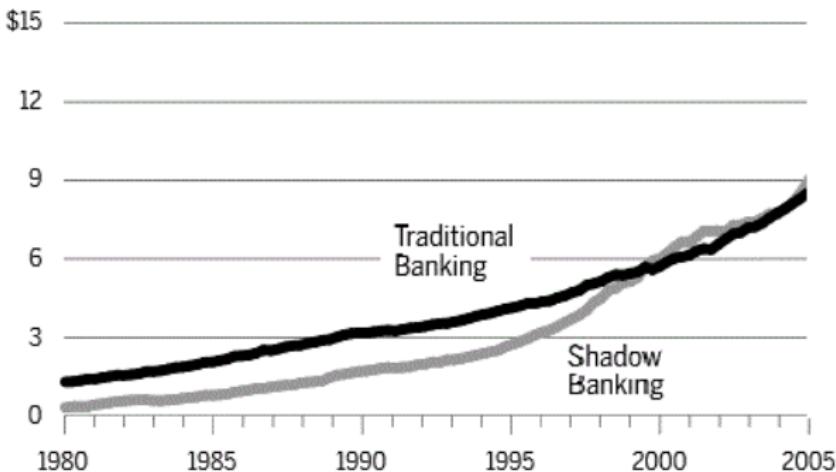
## A shift from banks tot non-banks

- ▶ In 1980, banks still held 60% of total debt instruments (loans and debt securities) held by the domestic financial sector... but
- ▶ total non-bank lending significantly outpaced bank lending beginning in the 1990s

## Traditional and Shadow Banking Systems

*The funding available through the shadow banking system grew sharply in the 2000s, exceeding the traditional banking system in the years before the crisis.*

IN TRILLIONS OF DOLLARS



NOTE: Shadow banking funding includes commercial paper and other short-term borrowing (bankers acceptances), repo, net securities loaned, liabilities of asset-backed securities issuers, and money market mutual fund assets.

SOURCE: Federal Reserve Flow of Funds Report

## Federal guarantees in the mortgage market

The rise of securitization, in the 1980s, was strongly supported by the introduction of federal guarantees in the mortgage market

- ▶ The US housing policy and particularly the introduction of federal guarantees in mortgages markets helped transform the funding structure of the US economy
- ▶ The creation of GSEs planted the seeds for linking mortgage markets with broader capital markets...
- ▶ by creating a strong secondary mortgage market for housing loans in order to provide a stable source of funding for residential mortgages across the country (particularly for low- and moderate-income households)
- ▶ ‘originate to distribute’ model

## Day 2 session 3 - A short history of Basel I and II

## Overview

- ▶ When a poorly capitalized financial firm suffers asset losses, the firm falls into distress
- ▶ Funding declines which means firms sells assets
- ▶ If the firm that faces the loss is significant, it affects the market by a decline in the aggregate shortfall of capital
- ▶ Systemic risk emerges and the financial system erodes
- ▶ Capital can save the financial system
- ▶ In response to the systemic effect of the failure of a relatively small German bank, Herstatt in 1974, Basel I was introduced
- ▶ It formulates international standards for banking supervision

## Basel I

Basel Capital Accord, the current international framework on capital adequacy, was adopted in 1988 by a group of central banks and other national supervisory authorities, working through the Basel Committee on Banking Supervision.

- ▶ objectives: promote soundness and stability of the international banking system, provide equitable basis for international competition among banks
- ▶ intended specifically for internationally active banks, but accord has been applied beyond largest institutions to cover most banks
- ▶ Accord is a framework for measuring capital adequacy and a minimum standard to be achieved by international banks in adopting countries
- ▶ Original framework → assessed capital mainly in relation to credit risk
- ▶ Credit risk ⇒ the risk of loss due to the failure of a counterparty to meet its obligations

## Basel I cont

The first Basel Capital Accord was published in July 1988 and fully implemented in the US by the end of 1992.

- ▶ Basel I imposes a minimum ratio of capital to risk-weighted assets of 8%

the Basel Capital Accord requires that a bank have available as "regulatory capital" (through combinations of equity, loan-loss reserves, subordinated debt, and other accepted instruments) at least 8 percent of the value of its risk-weighted assets (loans and securities, for example) and asset equivalent off-balance-sheet exposures (such as loan commitments, standby letters of credit, and obligations on derivatives contracts). Source:

<https://www.federalreserve.gov/pubs/bulletin/2003/0903lead.pdf>

## Need for a new capital standard

- ▶ Basel I, is widely viewed as having achieved its principal objectives of promoting financial stability and providing an equitable basis for competition among internationally active banks
- ▶ also seen as having outlived its usefulness, at least in relation to larger banking organizations
- ▶ but there are clear shortcomings

## Shortcomings of Basel I

- ▶ Too simple to address the activities of the most complex banking organizations
- ▶ Specifies only 4 levels of risk as implemented in the US, even though loans assigned the same risk weight (for example, 100 percent for commercial loans) can vary greatly in credit quality
- ▶ limited differentiation among degrees of risk → calculated capital ratios are often uninformative and may provide misleading information about a bank's capital adequacy relative to its risks
- ▶ → creates incentives for banks to *game* the system through regulatory capital arbitrage by selling, securitizing, or otherwise avoiding exposures for which the regulatory capital requirement is higher than the market requires and pursuing those for which the requirement is lower than the market would apply to that asset

## Towards Basel II

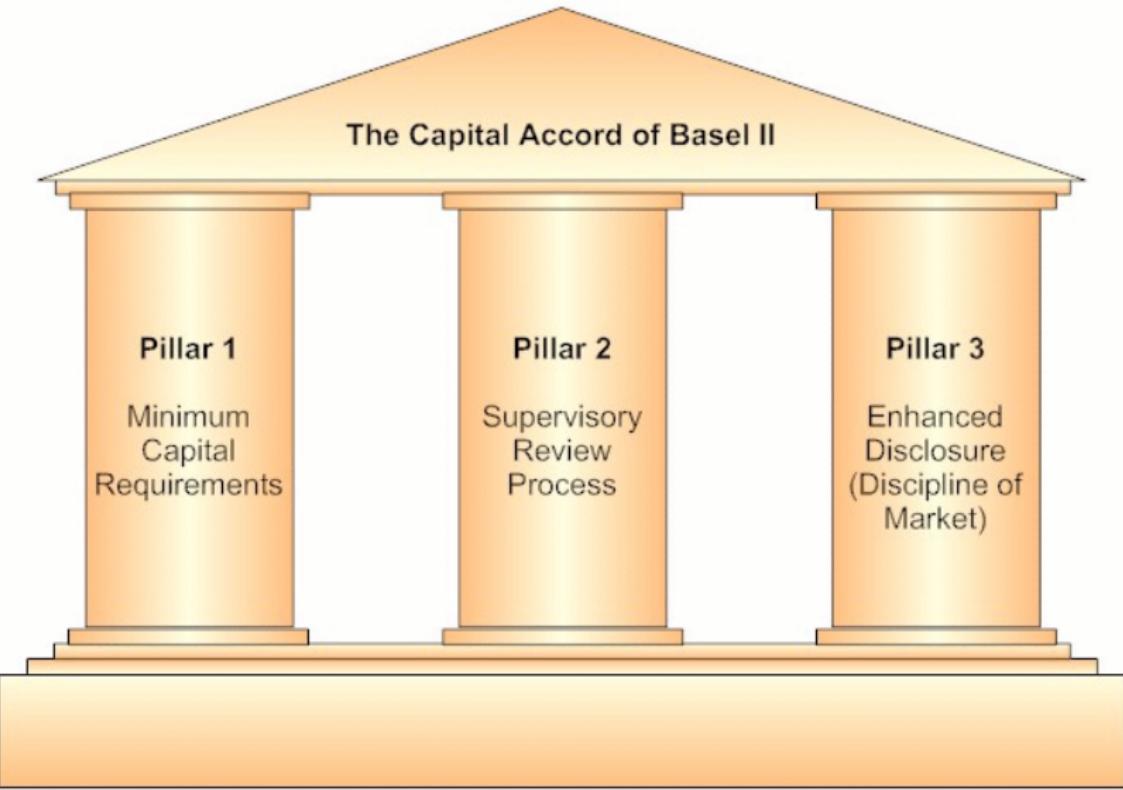
For the larger banks, in short, Basel I capital ratios neither reflected risk adequately nor measure bank strength accurately

- ▶ Evolution of the Art of Risk Measurement and Management.
  - ▶ Banks themselves led the development of new techniques to improve their risk management and internal economic capital measures in order to be more effective competitors and to control and manage their credit losses.
  - ▶ But, clearly they can go considerably further
- ▶ Continuing Concentration of the Banking Industry.
  - ▶ Market pressures have led to consolidation in banking around the world.
  - ▶ US banking system part of this trend;
  - ▶ → became increasingly concentrated - small number of very large banks, operating across a wide range of product and geographic markets
  - ▶ complex and sophisticated operations
  - ▶ these banks, with their scale and role in payment and settlement systems and in derivatives markets, have presented authorities with greater moral hazard

Source: <https://www.federalreserve.gov/pubs/bulletin/2003/0903lead.pdf>

## Basel II

- ▶ Consultative paper in April 2003
- ▶ focus: strengthening the regulatory capital framework for large, internationally active banking organizations through minimum capital requirements that are more sensitive to an institution's risk profile and that reinforce incentives for strong risk management
- ▶ proposed substitute for the current capital accord is more complex than Basel I



Source: IBM

## Day 2 Session 4

### The Global Financial Crisis

CHRISTIE'S

LEHMAN BROTHERS



## Leading up to the crisis

- ▶ Massive new inflows of capital into the US, mostly from oil-producing and Asian countries since the early 2000s
- ▶ Increase in house prices in the US (also Spain, Ireland, . . .)
- ▶ Mid-2006: house prices begin to stagnate
- ▶ February 2007: Prices of Credit Default Swaps for sub-prime mortgages in the US collapse by 30 %.
- ▶ Mid-June 2007: Bear Stearns injects \$3.2 billion in two hedge funds in order to avoid their liquidation.
- ▶ End July 2007: American Home Mortgage Investment Corp. ceases interest payments, bankruptcy on 6 August.
- ▶ 9 August: BNP Paribas suspends payouts for 3 investment funds because of the impossibility to value underlying assets.

Source: E von Thadden 2012

- ▶ September – December: increasing write-downs on mortgage backed securities
- ▶ January 2008: Hypo Real Estate (Germany) acknowledges temporary funding problems
- ▶ March 5: Carlyle Capital (NY) bankrupt. Bear Stearns suffers major losses.
- ▶ March 13: Bear Stearns obtains no more funding on the repo market
- ▶ March 14-16: Federal Reserve Bank of New York brokers the acquisition of Bear Stearns by JP Morgan Chase for \$236 million, loan of \$30 billion to JP Morgan Chase.
- ▶ September 15: Lehmann Brothers bankrupt with \$613 billion of debt, Merrill Lynch taken over by Bank of America.

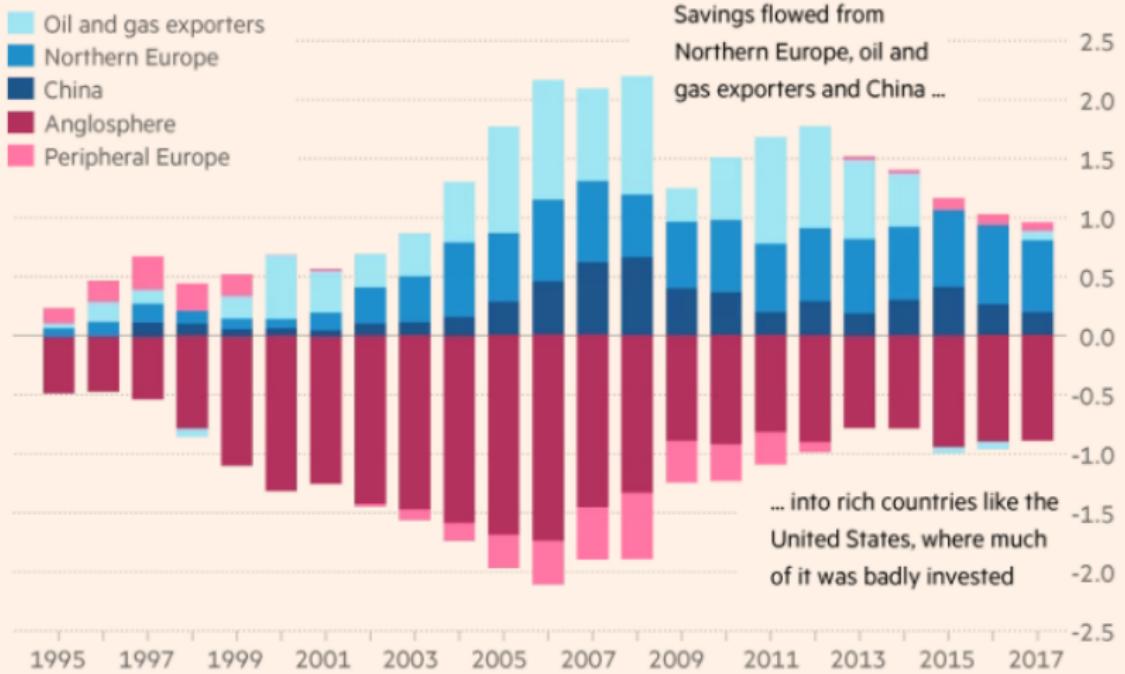
Source: E von Thadden 2012

## Causes of the crisis

- ▶ Excessive US mortgage lending
- ▶ Excessive securitization
- ▶ Failure of bank risk models
- ▶ Inadequate corporate governance of banks
- ▶ Faulty financial regulation: - systemic risk, shadow banking?
- ▶ Systemically Important Financial Intermediaries
- ▶ Break-down of interbank market
- ▶ Biased rating agencies
- ▶ Savings glut (China, Middle East, Germany, . . .)
- ▶ Real-estate price bubble (US, UK, Spain, . . .)
- ▶ US Federal Reserve interest rate policy

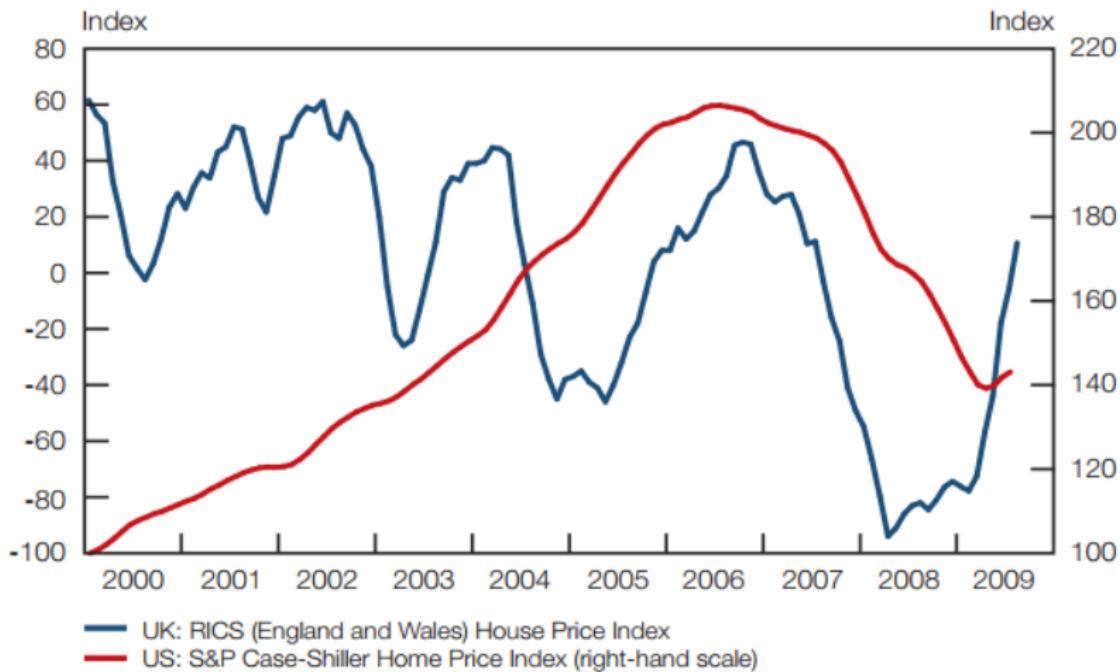
Source: E von Thadden 2012

## Current account balances as share of world GDP



Source: Financial Times. <https://www.ft.com/content/56d25a52-7df5-11e7-9108-edda0bc9c928>

## House price indices in the US and UK



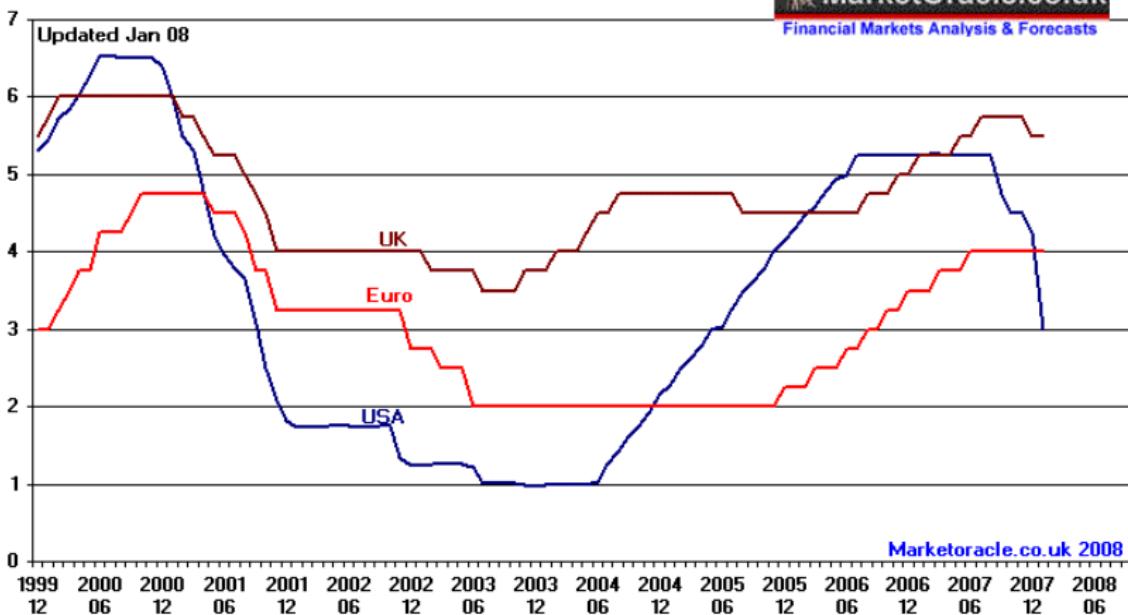
Source: Financial Stability Review, Sept 2009, SARB

## Interest Rates - USA / UK / Europe



MarketOracle.co.uk

Financial Markets Analysis & Forecasts



Source: Market Oracle.co.uk

NINJA loans



## NINJA = No Income, No Job or Assets

- ▶ sub-prime mortgages were mis-sold in their millions by lenders desperate to feed the pipeline for securitising, or packaging up, these loans by investment banks
- ▶ Research by the industry's regulator, the Financial Services Authority:
  - ▶ poor practices by mortgage brokers (account for more than 60 per cent of all mortgages sold) and lenders
  - ▶ in half the cases it investigated customers had self-certified their income
  - ▶ significant numbers of consumers' had been advised to remortgage - thus incur additional charges, without the adviser being able to demonstrate that this was beneficial to the customer
  - ▶ in a third of cases the intermediaries failed to assess properly the borrower's ability to afford the mortgages
  - ▶ Lenders had inadequate lending standards which they often failed to apply properly

- ▶ Basel I imposes a minimum ratio of capital to risk-weighted assets of 8%
- ▶ Basel II expands on Basel I's capital requirement rule and introduces internal risk assessment processes
- ▶ Basel III is implemented by the Dodd-Frank Wall-Street Reform and Consumer Protection Act

The Basel process focuses on capital requirements and ignores crucial market and regulation failures of the financial system as follows:

1. Focus on the risk of individual institution, not the system
  2. Runs into shadow banking issues because of this focus
  3. No recognition of the role of government
- 
- ▶ Even with the tightening of off-balance-sheet financing in Basel III , the focus is not to measure quantities that reflect systemic risk
  - ▶ There are two types of risk that causes a firm to fail:
    1. Solvency risk: Market value of a firm's assets falls below its obligations
    2. Liquidity risk: Firms cannot convert assets into cash to pay off its obligations because asset markets have become illiquid
  - ▶ These risks spread quickly through fire sales, counterparty risk or contagious runs

## Financial crisis of 2007 to 2009

- ▶ During this time banks and other intermediaries shift risks by exploiting loopholes in regulatory capital requirements
- ▶ The following table shows the 12 largest write-downs (credit losses) of US financial institutions from June 2007 till March 2010

Firm	Write-Downs and Credit Losses (\$ Billions)	Equity Return (June 2007–Dec. 2008)	Equity Return (June 2007–Sept. 16, 2008)
Fannie Mae	151.4	−98.14%	−99.23%
Citigroup	130.4	−82.46	−67.20
Freddie Mac	118.1	−97.98	−99.56
Wachovia	101.9	−88.34	−73.18
Bank of America	97.6	−67.79	−34.35
AIG	97.0	−97.57	−94.50
JPMorgan	69.0	−31.51	−12.13
Merrill Lynch	55.9	−85.16	−72.45
Wells Fargo	47.4	−10.77	4.47
Washington Mutual	45.3	−99.95	−90.07
National City	25.2	−94.29	−86.61
Morgan Stanley	23.4	−75.99	−57.65

Source: Bloomberg.

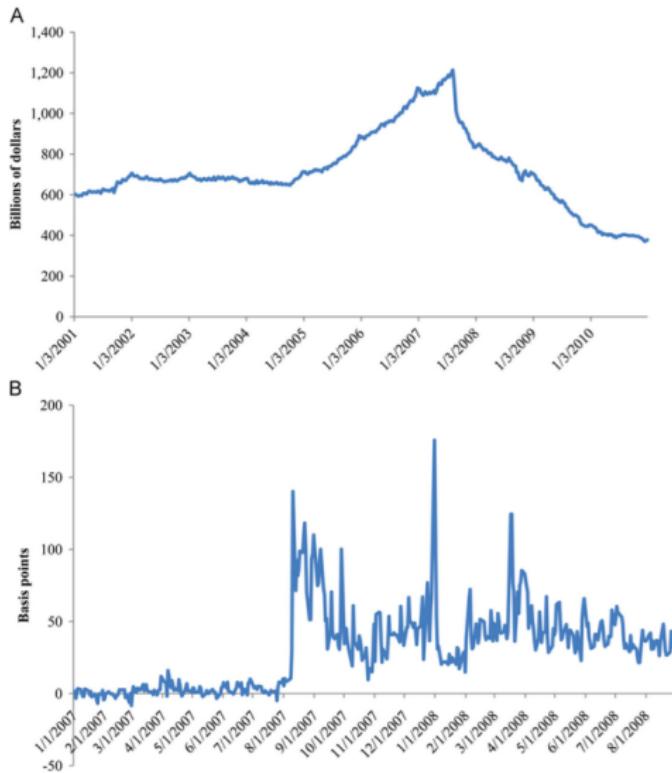
- ▶ The top 6 firms combined for a total of 696 billion dollars in losses
- ▶ The last column shows market the value of the firms, 6 firms dropped in market value, averaging  $-88.71\%$  from June 2007 till December 2008
- ▶ It also shows that under the Basel core capital requirement, the top 20 US banks looked safe, averaging a ration of 11.70%
- ▶ Reasons this happened:
  1. LCFI's took their leveraged bets and used it to engage in **regulatory arbitrage**
  2. They funded portfolios of risky loans via off-balance-sheet vehicles
  3. Loans were guaranteed by sponsoring LCFI's through liquidity enhancements that have lower requirements by the Basel Accord
  4. They made purchases of AAA-rated tranches of non-prime securities which implies low credit risk and zero liquidity and funding risk
  5. Full capital relief on AAA-rated tranches

- ▶ The solution is for banks to provide their counterparties with guarantees on the underlying credit
- ▶ The guarantees have two effects:
  1. Guaranteeing the risk to bank counterparties leads to move assets off the banks balance sheets
  2. Ensures highest ratings for off-balance-sheet vehicles from rating agencies

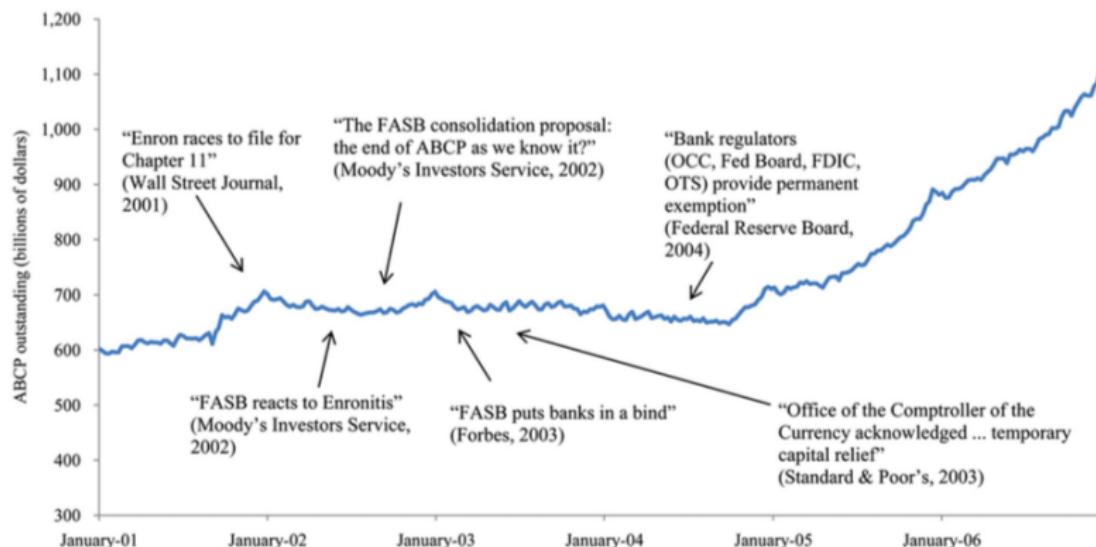
- ▶ Acharya, Schnabl and Suarez (2009) documented an increase in the ABCP (asset backed commercial paper) from 600 million dollars in 2004 to 1.2 trillion dollars in the second quarter of 2007
- ▶ Collapse occurred: cost of issuing ABCP rose from 15 basis points over the federal funds rate to over 100 basis points
- ▶ Banks had to return the loans to their balance sheets
- ▶ Of the 1.2 trillion dollars in asset-based securitized vehicles, 4.3 % of the loss was structured to remain with investors
- ▶ The remaining loss wiped out significant portions of bank capital and threatened banks solvency
- ▶ Another method would be for banks to make loans and move them from its balance sheet by securitizing them

## Day 2 Session 5 - Interlude: Regulatory Arbitrage

# Acharya, Schnabl, and Suarez (2013, JFE) "Securitization Without Risk Transfer"



# Acharya, Schnabl, and Suarez (2013, JFE) "Securitization Without Risk Transfer"



# Acharya, Schnabl, and Suarez (2013, JFE) "Securitization Without Risk Transfer"

**Table 1**

Conduits and sponsors.

This table shows the ten largest conduits and sponsors as of January 1, 2007. The sample is restricted to bank-sponsored conduits. The information is collected from Moody's Rating Reports and Bankscope. "ABCP (billion)" denotes asset-backed commercial paper (ABCP) outstanding per conduit (Panel A) and sponsor (Panel B). "Asset origin," "Asset rating," and "Asset type" denote characteristics of the main asset class owned by a conduit; CDO/CLO represents combinations of collateralized debt obligations and collateralized loan obligations.

Panel A: Ten largest conduits

Program name	Sponsor	ABCP (billion)	Guarantee	Asset origin	Asset rating	Asset type (share)
Grampian Funding	HBOS	37.9	Liquidity	United States	AAA	Residential mortgages (36%)
Amstel Funding	ABN Amro	30.7	Liquidity	Netherlands	AAA	CDO/CLO (84%)
Scaldis Capital	Fortis Bank	22.6	Liquidity	United States	AAA	Asset-backed securities (77%)
Sheffield Receivables	Barclays	21.4	Liquidity	n.a.	NR	Mortgages (43%)
Morrigan TRR	Hypo Public	18.9	Credit	n.a.	n.a.	Bonds (51%)
Cancara Asset	Lloyds	18.8	Liquidity	Great Britain	AAA	Residential mortgages (43%)
Solitaire Funding	HSBC	18.5	Liquidity	United States	AAA	Residential mortgages (45%)
Rhineland Funding	IKB	16.7	Liquidity	United States	AAA	CDO/CLO (95%)
Mane Funding	ING	13.7	Liquidity	n.a.	AAA	Asset-backed securities (91%)
Atlantis One	Rabobank	13.5	Liquidity	United States	NR	Commercial loans (100%)

Panel B: Ten largest sponsors

Sponsor	Country	ABCP (billion)	Assets (billion)	Tier 1 capital (billion)	ABCP/Tier 1 (percent)	Tier 1 ratio (percent)
Citigroup	United States	92.7	1,884.3	90.9	102.0	8.6
ABN Amro	Netherlands	68.6	1,300.0	31.2	219.5	8.5
Bank of America	United States	45.7	1,459.7	91.1	50.2	8.6
HBOS Plc	Great Britain	43.9	1,161.7	44.0	99.7	8.1
JP Morgan	United States	42.7	1,351.5	81.1	52.7	8.7
HSBC	Great Britain	39.4	1,860.8	87.8	44.9	9.4
Deutsche Bank AG	Germany	38.7	2,070.0	31.0	125.0	8.5
Société Générale	France	38.6	1,260.2	29.4	131.3	7.8
Barclays Plc	Great Britain	33.1	1,956.7	45.2	73.2	7.7
Rabobank	Netherlands	30.7	732.9	34.8	88.3	10.7

# Acharya, Schnabl, and Suarez (2013, JFE) "Securitization Without Risk Transfer"

**Table 2**

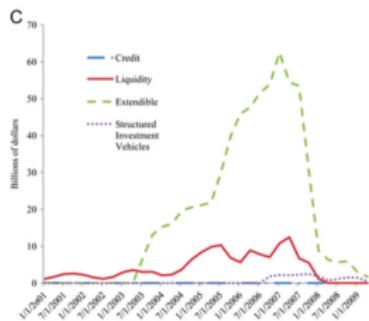
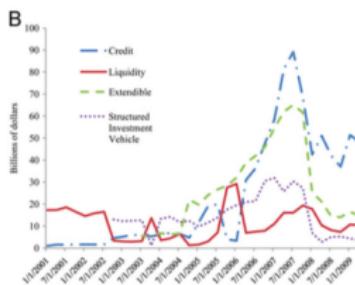
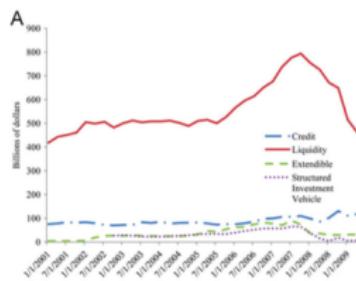
Conduit and sponsor statistics.

This table includes all conduits rated by Moody's Investors Service as of January 1, 2007. Panel A shows summary statistics by conduit. "Risk transfer" refers to the sponsor guarantee. "Assets" is the conduit's main asset type. "Currency" is the conduit's issuing currency. Panel B aggregates conduits by sponsor. "Sponsor type" is the sponsor type. "Country of origin" denotes the sponsor's headquarters.

	Panel A: Conduits		Size		
	Total	Number of conduits	Size (billion)	Mean	Standard deviation
All conduits	301		1,236.2	4.1	(5.1)
Risk transfer					
Liquidity	163		752.9	4.6	(5.7)
Credit	55		159.9	2.9	(4.6)
Extendible notes	55		230.9	4.2	(4.5)
Structured investment vehicle	28		92.6	3.3	(3.4)
Assets					
Asset-backed securities	91		387.4	4.2	(5.9)
Loans	39		65.3	1.6	(2.4)
Receivables	88		436.7	3.5	(4.9)
Mixed asset categories	59		272.9	4.6	(5.3)
Other	24		74.0	4.9	(4.7)
Currency					
US dollar	233		973.0	4.2	(4.6)
Euro	33		220.0	6.7	(8.4)
Other	35		43.2	1.2	(1.6)
Panel B: Sponsors					
	Total		Size		
	Number of sponsors	Size (billion)	Mean	Standard deviation	
All programs	127	1,236.2	9.7	(14.7)	
Sponsor type					
Commercial banks	67	911.4	13.6	(17.6)	
Structured finance	19	155.8	8.2	(13.7)	
Mortgage lender	18	75.5	4.2	(5.8)	
Investment manager	5	17.6	3.5	(3.3)	
Investment banks	4	11.0	2.7	(2.2)	
Other	14	64.8	4.6	(6.2)	
Country of origin					
United States	67	491.8	7.3	(14.7)	
Germany	15	204.1	13.6	(11.6)	
United Kingdom	10	195.7	19.6	(17.0)	
Other	35	344.5	9.8	(14.4)	

# Acharya, Schnabl, and Suarez (2013, JFE) "Securitization Without Risk Transfer"

ABCP outstanding by sponsor and guarantee. A - Commercial banks, B - structured finance companies, C - Mortgage originators



# Acharya, Schnabl, and Suarez (2013, JFE) "Securitization Without Risk Transfer"

**Table 3**

Commercial banks and conduit activity.

This table shows conduit exposure of commercial banks. Panel A provides summary statistics for commercial banks with more than \$50 billion in assets headquartered in Europe or the United States for the fiscal years 2000–2006. "Conduit exposure" is the ratio of asset-backed commercial paper outstanding to total equity. "Leverage ratio" is the ratio of equity to assets. "Tier 1 ratio" is the ratio of Tier 1 to risk-weighted assets. "Assets" and "Log(Assets)" are total assets and the logarithm of total assets, respectively. "Return on assets" is the ratio of net profit to assets. "Share short-term debt," "Share deposits," and "Share loans" are short-term debt, banks deposits, and loans as a share of total assets, respectively. Panel B provides correlations between the main variables.

Panel A: Summary statistics (126 banks)						
Variable	Mean	Standard deviation	Median	Minimum	Maximum	N
Conduit exposure (total)	32.20%	81.50%	0.00%	0.00%	999.10%	814
Conduit exposure (liquidity)	25.20%	63.20%	0.00%	0.00%	726.30%	814
Conduit exposure (credit)	1.80%	8.10%	0.00%	0.00%	89.70%	814
Leverage ratio	5.40%	2.60%	4.90%	0.80%	16.90%	814
Tier 1 ratio	8.41%	2.00%	8.00%	4.30%	19.00%	814
Assets (billions of dollars)	260.8	326.4	134.9	9.7	2,070	814
Log(Assets)	4.973	1.086	4.905	2.27	7.635	814
Return on assets	0.80%	0.60%	0.70%	-1.70%	3.10%	814
Share short-term debt	11.70%	9.90%	9.50%	0.00%	51.60%	814
Share deposits	57.60%	13.50%	59.80%	1.80%	86.80%	814
Share loans	54.20%	17.10%	55.90%	4.80%	85.90%	814

Panel B: Correlations (N=814)							
Variable	Conduit exposure (total)	Conduit exposure (liquidity)	Conduit exposure (credit)	Leverage ratio	Tier 1 ratio	Log Assets	Return on assets
Conduit exposure (total)	1						
Conduit exposure (liquidity)	0.7929	1					
Conduit exposure (credit)	0.2009	0.1445	1				
Leverage ratio	-0.2013	-0.1969	0.0119	1			
Tier 1 ratio	-0.0318	-0.035	-0.0265	0.2582	1		
Log(Assets)	0.2228	0.2542	0.2357	-0.3088	-0.0931	1	
Return on assets	-0.188	-0.2039	-0.0172	0.7243	0.3046	-0.2218	1

# Acharya, Schnabl, and Suarez (2013, JFE) "Securitization Without Risk Transfer"

Name	Missing capital			
	Tier 1	ABCP	Total	Percent
Citigroup	90.9	92.7	7.4	8.2
ABN Amro	31.2	68.6	5.5	17.6
Bank of America	91.1	45.7	3.7	4.0
HBOs	44	43.9	3.5	8.0
JP Morgan Chase	81.1	42.7	3.4	4.2
HSBC Holdings	87.8	39.4	3.2	3.6
Deutsche Bank	31	38.7	3.1	10.0
Société Générale	29.4	38.6	3.1	10.5
Barclays	45.2	33.1	2.6	5.9
Mitsubishi UFJ Financial Group	68.5	32.0	2.6	3.7
Rabobank	34.8	30.8	2.5	7.1
Westdeutsche Landesbank	9.5	29.9	2.4	25.1
ING Groep	54.3	26.4	2.1	3.9
Dresdner Bank	18.7	23.2	1.9	9.9
Fortis	16.4	22.6	1.8	11.0
Bayerische Landesbank	15.8	22.4	1.8	11.3
Bayerische Hypo-und Vereinsbank	14.1	22.3	1.8	12.6
State Street Corporation	24.1	21.9	1.7	7.2
Crédit Agricole	6.5	19.5	1.6	24.1
Hypo Real Estate	4.5	18.9	1.5	33.4
Lloyds Banking Group	6.1	18.8	1.5	24.6
Countrywide Financial Corporation	25.2	18.3	1.5	5.8
GMAC	15.4	17.5	1.4	9.1
Royal Bank of Scotland	75.2	15.8	1.3	1.7
Royal Bank of Canada	52.3	15.6	1.2	2.4
Bear Stearns Companies	19.1	13.8	1.1	5.8
KBC Group	22.9	12.6	1	4.4
Sachsen Landesbank	1.3	12.5	1	79.9
BNP Paribas	62.3	11.6	0.9	1.5
Bank of Montreal	45.3	11.5	0.9	2.0
Total	1,124.0	861.5	68.9	6.1

## Day 2 Session 6 - The global financial crisis and the response in the US

- ▶ However, banks then reinvest in AAA-rated tranches of the same securitized products it had created
- ▶ Due to the AAA-ratings, securities had a significantly lower capital requirement under Basel III
- ▶ Basel Accord weighted the risk of AAA-rated securities at less than half of the risk of ordinary commercial or mortgage loans
- ▶ This leads to lower capital reserves for them
- ▶ 2004: SEC allowed American investment banks the ability to employ internal models
- ▶ These allow for banks to assess credit risk and the corresponding capital change
- ▶ Debt-to-equity ratio: Moves from 22:1 to 33:1 over 3 years

- ▶ Banks, GSE's and broker dealers in 2007 held 789 billion dollars of AAA-rated collateralized debt obligation (CDO) tranches
- ▶ These are backed by non-prime loans
- ▶ Majority of the subordinated tranches of the CDO's were also held by banks
- ▶ They collectively held 320 billion dollars out of the 476 billion dollars of total outstanding tranches

## US response to Lehman collapse and the subsequent crisis

### Troubled Asset Relief Program (TARP)

- ▶ The Emergency Economic Stabilization Act of 2008 (EESA) created the TARP program
- ▶ signed into law by President George W. Bush on 3 October 2008
- ▶ TARP program originally authorized expenditures of \$700 billion (In 2010 amount was reduced by Dodd-Frank Wall Street Reform and Consumer Protection Act)
- ▶ allows the Treasury to purchase illiquid, difficult-to-value assets from banks and other financial institutions
- ▶ TARP does not allow banks to recoup losses already incurred on troubled assets
- ▶ (EESA) requires financial institutions selling assets to TARP to issue equity warrants, equity or senior debt securities (for non-publicly listed companies) to the Treasury

## US response to Lehman collapse and the subsequent crisis

### Public-Private Investment Program (P-PIP)

- ▶ buy toxic assets from banks' balance sheets
- ▶ P-PIP has two primary programs
  - ▶ Legacy Loans Program - attempt to buy residential loans from bank's balance sheets: Federal Deposit Insurance Corporation (FDIC) will provide non-recourse loan guarantees for up to 85 percent of the purchase price of legacy loans
  - ▶ Legacy securities program - buy residential mortgage backed securities (RMBS) that were originally rated AAA and commercial mortgage-backed securities (CMBS) and asset-backed securities (ABS) which are rated AAA. The funds will come in many instances in equal parts from the U.S. Treasury's TARP monies, private investors, and from loans from the Federal Reserve's Term Asset-Backed Securities Loan Facility (TALF).

# Financial Crisis timeline

## ⌚ History of the Financial Crisis: Mid-2007 to 2010



Source:<http://www.businessinsider.com/chart-financial-crisis-2013-9>

## Day 3 Session 1 - The global financial crisis not just in the US - Focus on Iceland



## Iceland Financial Crisis - Regulatory environment

- ▶ Banks deregulated in 2001 - set stage for banks to upload debts when foreign companies were accumulated
- ▶ Three big banks - Landsbanki, Glitnir and Kaupthing
- ▶ rapid growth facilitated by Iceland's membership in the European Economic Area (EEA) - created regulatory framework rooted in the directives adopted by the European Union
- ▶ = operating licenses granted to Icelandic financial companies extended not only to Iceland but to all other EEA states
- ▶ Icelandic Financial Supervisory Authority based its operations on European law, regulations, and procedures, and was given good marks by rating agencies and the International Monetary Fund.

## Iceland Financial Crisis - global financial markets

- ▶ supply of credit was virtually inexhaustible
- ▶ interest rates lower than they had been in a hundred years
- ▶ financial markets - search for yield
  - Bonds issued by Iceland's banks (welcome addition to popular structured securities)
- ▶ Rating agencies - favourable credit ratings for bonds
- ▶ banks became a vital link in the national economy

## Iceland - Rising debt

- ▶ 15 percent interest rates - attract deposits especially from the Netherlands and the UK
- ▶ Iceland's currency, the krona, became a major trading currency - value high
- ▶ Banks' balance increase: cheap foreign financing allowed banking sector to increase assets from 100 to almost 900 percent of GDP between 2004 and end-2007
- ▶ Households also increase debt
- ▶ Higher demand = higher inflation = interest rates kept high

## Iceland - something is not right..

- ▶ banks attracted international attention late in 2005 and early in 2006
- ▶ received more probing and critical coverage by the media, including scrutiny of growth rate, risk appetite, low deposit ratio's, lack of transparency etc.
- ▶ CDS spreads began rising toward the end of 2005
- ▶ February 2006 - Iceland's Prime Ministry, Ministry of Finance, Ministry of Business Affairs, Financial Supervisory Authority, and Central Bank concluded a collaboration agreement centering on financial stability and contingency measures
- ▶ government established an advisory group on basis of this agreement

## Banks' response to criticism

- ▶ greatly enhanced their information disclosure
- ▶ sought to reduce cross-ownership,
- ▶ improve liquidity position and capital ratios,
- ▶ took the first steps toward increasing the share of deposits on balance sheets, increased presence in retail deposit market abroad
- ▶ Sought out new credit markets - including the US

Because of this, the Icelandic banks were perhaps better prepared than they would otherwise have been for the sudden changes that took place in the global financial markets in mid-2007

Source: <http://www.bis.org/review/r090226d.pdf>

## Iceland - Yay for deposits (!?)

- ▶ Sharp increase in risk aversion following developments in global financial markets
- ▶ Credit supply shrinks
- ▶ CDS spreads increase, also for Icelandic banks
- ▶ Banks still confident - some leaders said *easy to fund all outstanding bonds and other debt for the coming years through deposit business in Europe*

## But..growing opposition to the Icelandic banks' accumulation of deposits

### Why?

- ▶ banks in those same parts of Europe felt the pressure of the sudden competition and communicated their concerns to their authorities
- ▶ accumulation of deposits in foreign subsidiaries increased the potential obligations of the deposit insurance schemes in the countries of operation
- ▶ concerns that the relatively high interest rates offered by the Icelandic banks might reflect underlying weakness
- ▶ concern about the Icelandic deposit insurance scheme with respect to deposits in foreign bank branches

## The Central Bank of Iceland

- ▶ said that banks' foreign deposits should be held in subsidiaries rather than branches - i.e. Landsbanki's deposit business in London should be transferred to a subsidiary of the bank.
- ▶ Preparation for the transfer began in early 2008
- ▶ Central bank thought the process had started, but by July it had not - the central bank did not have the power to force changes or make demands.
- ▶ Moreover - other Icelandic authorities also had limited legal power in this respect under the legislation then in force which was and is based on EU Directives.
- ▶ Central bank kept close watch on the liquidity of the Icelandic banks throughout 2008
- ▶ tracked the banks' liquidity virtually on a daily basis and kept abreast of their refinancing efforts and asset sales

- ▶ Glitnir, had a large foreign loan payment coming up in mid-October
- ▶ Glitnir not active in creating retail deposit market abroad
- ▶ increased liquidity by selling assets
- ▶ mid-Sept: Meeting with central bank - Prospects for funding the October payment were good
- ▶ **LEHMAN BROTHERS COLLAPSE**
- ▶ ⇒ virtually completed sale of Glitnir assets did not materialise

## Central bank assistance required

- ▶ unsuccessful to sell assets
- ▶ unable to renew a bank loan
- ▶ →Glitnir turned to the Central Bank for assistance
- ▶ Ultimately, the Government decided that the Treasury should acquire a majority holding in Glitnir
- ▶ before that could be finalised, the bank collapsed

- ▶ substantial pressure on Landsbanki's deposit accounts in London in early October
- ▶ British Financial Services Authority (FSA) steadily tightened the demands it made on the bank
- ▶ Landsbanki's liquidity difficulties became insurmountable, and it was clear that rescuing the bank would not represent prudent use of the Central Bank's foreign exchange reserves - amounts were too large

## The last big bank standing - Kaupthing

- ▶ In view of the prospects for Kaupthing's liquidity, the bank was deemed likely to survive the storm
- ▶ thus central bank, after consultation with government, granted the bank a collateralized 4-day loan that was expected to suffice
- ▶ but FSA took action against the Kaupthing subsidiary

## Banking crisis

- ▶ three leading commercial banks, representing about 85 percent of total banking assets collapsed - within a week
- ▶ Icelandic Financial Supervisory Authority took over their operations on the basis of newly adopted legislation, and they were divided into two entities, the new banks and the old
- ▶ The new banks, owned by the government, took over domestic banking activities
- ▶ foreign operations remained within the old banks, which have been granted a moratorium on payment.
- ▶ government's response in October was guided by the overriding aim of guaranteeing continued domestic banking operations and domestic and cross-border payment intermediation under extraordinarily difficult circumstances.

- ▶ The Central Bank of Iceland expanded its liquidity facilities, as did its foreign counterparts.
- ▶ Iceland's banks obtained funding both from their own Central Bank
- ▶ also through their foreign subsidiaries, from the ECB (in euros)
- ▶ the Central Bank of Iceland could not provide liquidity in currencies other than the Icelandic króna
- ▶ Banks became heavily dependent on ready access to liquidity facilities.
- ▶ Icelandic government negotiated a Stand-By Facility from the International Monetary Fund on basis of economic programme
- ▶ Focussed on three objective
  - ▶ stabilise the foreign exchange market and provide support for the appreciation of the króna from its recent exceptionally low levels;
  - ▶ formulate fiscal policy for 2009 and beyond aimed at establishing a sustainable level of debt;
  - ▶ restructure banking system in a transparent manner consistent with internationally recognised practice.

LATUFF  
2010  
x  
DROMOS



## Day 3 Session2: Global financial crisis spillovers

2008 Country Stock Market Performance			
Country	2008 % Chg	Country	2008 % Chg
Ghana	58.06	Denmark	-46.63
Tunisia	10.65	Abu Dhabi (UAE)	-47.49
Ecuador	5.88	Thailand	-47.56
Costa Rica	-4.36	Poland	-48.21
Bangladesh	-7.35	Hong Kong	-48.27
Venezuela	-7.42	Philippines	-48.29
Morocco	-13.41	Italy	-48.40
Botswana	-16.46	Singapore	-49.17
Slovakia	-19.41	Portugal	-49.72
Lebanon	-21.54	Argentina	-49.82
Chile	-22.13	Indonesia	-50.64
Mexico	-24.23	Israel	-51.14
South Africa	-25.72	Turkey	-51.63
Jamaica	-25.76	Netherlands	-52.32
Qatar	-28.12	India	-52.45
Colombia	-29.30	Czech Republic	-52.72
Bermuda	-30.41	Norway	-52.82
Britain	-31.33	Hungary	-53.34
New Zealand	-32.80	Finland	-53.41
Bahrain	-34.52	Belgium	-53.76
Switzerland	-34.77	Egypt	-53.93
Malta	-35.03	Latvia	-54.43
Canada	-35.03	Saudi Arabia	-56.49
Kenya	-35.33	Pakistan	-58.34
Puerto Rico	-36.00	Luxembourg	-59.45
Mauritius	-36.15	Peru	-59.78
Kuwait	-38.03	Austria	-61.02
United States	-38.49	Estonia	-62.98

## Spillovers - European Sovereign Debt crisis

- ▶ Starting in October 2008, European governments bailed out or guaranteed the debt of their banking system
- ▶ Total amount of state aid (guarantees, liquidity measures, bank recapitalizations, impaired assets) 10/2008 – 10/2011: 37 per cent of GDP

## Background - The start of the European Sovereign Debt crisis

- ▶ The euro was established in Maastricht by the European Union (EU) in 1992
- ▶ 1999 currency comes into existence, notes and coin introduced in 2002
- ▶ December 2008, EU leaders agree on a 200bn-euro stimulus plan to help boost European growth following the global financial crisis
- ▶ 2009 EU orders France, Spain, the Irish Republic and Greece to reduce their budget deficits
- ▶ Collapse of Iceland's banking system seen to have spread to Greece, Ireland and Portugal in 2009
- ▶ December 2009 - Greece admits that its debts have reached 300bn euros - the highest in modern history.
- ▶ Greece is burdened with debt amounting to 113% of GDP - nearly double the eurozone limit of 60%.
- ▶ Ratings agencies start to downgrade Greek bank and government debt.

## Concerns over sovereign debt increases

- ▶ In January 2010, an EU report condemns "severe irregularities" in Greek accounting procedures. Greece's budget deficit in 2009 is revised upwards to 12.7%, from 3.7%, x4 the maximum allowed by EU rules.
- ▶ February 2010 Greece unveils a series of austerity measures aimed at curbing the deficit
- ▶ Concern starts to build about all the heavily indebted countries in Europe - Portugal, Ireland, Greece and Spain.
- ▶ The austerity plans in Greece spark strikes and riots in the streets
- ▶ The eurozone and IMF agree a safety net of 22bn euros to help Greece - but no loans
- ▶ eurozone countries agree to provide up to 30bn euros in emergency loans
- ▶ EU announces that the Greek deficit is even worse than thought after reviewing its accounts - 13.6% of GDP, not 12.7%.

## Bailout package Greece and Ireland

- ▶ May 2010 - eurozone members and the IMF agree a 110bn-euro bailout package to rescue Greece
- ▶ Euro continue to depreciate
- ▶ other EU member state debt starts to come under scrutiny, starting with the Republic of Ireland
- ▶ EU and IMF agree to a bailout package to the Irish Republic totalling 85bn euros. The Irish Republic soon passes the toughest budget in the country's history
- ▶ Amid growing speculation, the EU denies that Portugal will be next for a bailout

Source:<http://www.bbc.com/news/business-13856580>

## European Sovereign Debt crisis - Portugal and Greece again

- ▶ February 2010, eurozone finance ministers set up a permanent bailout fund, called the European Stability Mechanism, worth about 500bn euros
- ▶ April 2010 - Portugal admits it cannot deal with its finances itself and asks the EU for help
- ▶ May, the eurozone and the IMF approve a 78bn-euro bailout for Portugal
- ▶ June 2010, eurozone ministers say Greece must impose new austerity measures before it gets the next tranche of its loan, without which the country will probably default on its enormous debts
- ▶ July 2010, the Greek parliament votes in favour of a fresh round of drastic austerity measures, the EU approves the latest tranche of the Greek loan, worth 12bn euros
- ▶ second bailout for Greece is agreed - 109bn-euro package
- ▶ August - is crisis spreading beyond periphery?
- ▶ yields on government bonds from Spain and Italy rise sharply, the ECB says it will buy Italian and Spanish government bonds

## The role of the ECB

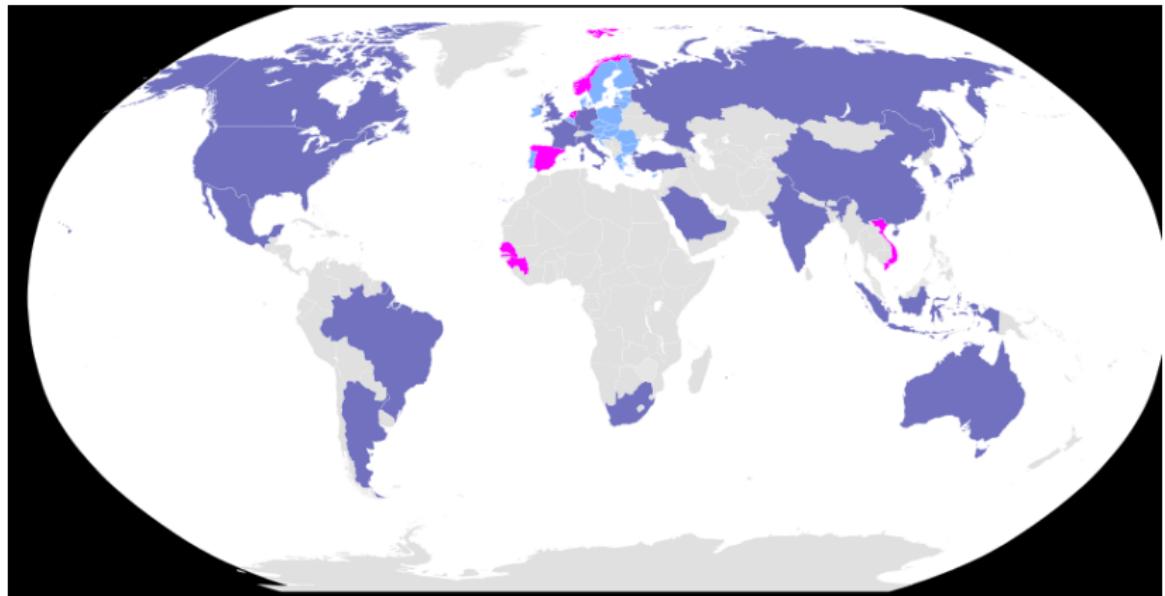
- ▶ during the European sovereign debt crisis the weaknesses of the EMU's institutional setting and the consequences of the private sector involvement highlighted how individual country-level risks can adversely affect and segment capital markets.
- ▶ ECB is at the center stage of the Eurozone crisis, particularly because of the lack of commitment of national governments with respect to further integration

Source: Acharya V.V and Steffen, S. The Importance of a Banking Union and Fiscal Union for a Capital Markets Union, 2017

Day 3 Session 3  
Global financial crisis - International Regulatory response

## G20

The G20 (or Group of Twenty) is an international forum for the governments and central bank governors from 20 major economies.



## G20 Seoul Summit Declaration, 2010

"We are committed to take action at the national and international level to raise standards, and ensure that our national authorities implement global standards developed to date, consistently, in a way that ensures a level playing field, a race to the top and avoids fragmentation of markets, protectionism and regulatory arbitrage. In particular, we will implement fully the new bank capital and liquidity standards and address too-big-to-fail problems."

Source: The Seoul summit document. <http://online.wsj.com/public/resources/documents/G20COMMUN1110.pdf>

# Basel Committee on Banking Supervision

## The Basel Committee mandate

The Basel Committee on Banking Supervision (BCBS) is the primary global standard setter for the prudential regulation of banks and provides a forum for cooperation on banking supervisory matters. Its mandate is to strengthen the regulation, supervision and practices of banks worldwide with the purpose of enhancing financial stability.

For a detailed overview of the BCBS mandate, view the full version of the [Basel Committee Charter](#).



Source <https://www.bis.org/bcbs/about.htm>

## Basel Committee on Banking Supervision

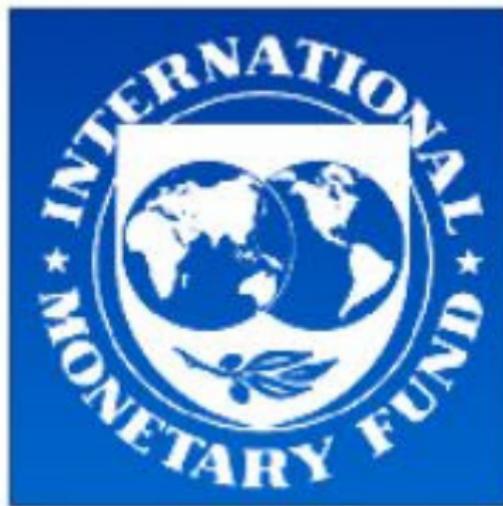
In response to the 2007-2009 global financial crisis, the BCBS issued what is referred to as Basel II.5 as an amendment to Basel II

- ▶ Basel II.5 designed to better capture credit risk in the “trading book” of a bank
- ▶ Trading book → to securities that a bank would not hold to maturity and would also be accounted for at current market value.
- ▶ intended to prevent strategic but inappropriate placement of securities in the book that would provide the most favorable accounting treatment at a particular point in time, potentially resulting in a bank having an insufficient capital buffer to mitigate lending risks

Source: <https://fas.org/sgp/crs/misc/R42744.pdf>

## International Monetary Fund

Created in 1945, the IMF is governed by and accountable to the 189 countries that make up its near-global membership.



The IMF is working to foster global monetary cooperation, secure financial stability, facilitate international trade, promote high employment and sustainable economic growth, and reduce poverty around the world.

## IMF's Response to the Global Economic Crisis

- ▶ Creating a crisis firewall
- ▶ Stepping up crisis lending.
- ▶ Helping the world's poorest.
- ▶ Sharpening IMF analysis and policy advice.
- ▶ Reforming the IMF's governance.

Day 3 Session 4  
Global financial crisis - Central bank responses

## A challenge issued to central banks

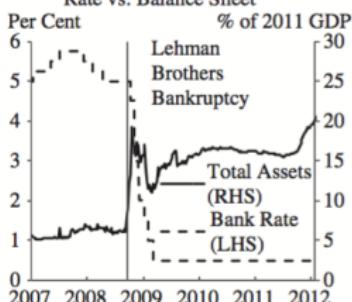
- ▶ Central banks operate within legal framework set by regulation
- ▶ Is it better to prevent bubbles or to mop up after the crash?  
⇒ Pre-crisis: mopping up after the crash
- ▶ The zero lower bound (why? Cash as alternative)
- ▶ Monetary policy implementation needs working financial system, in particular working interbank market
- ▶ “*Unconventional*” monetary policy is set of tools to circumvent zero lower bound

*“The problem with QE is that it works in practice, but it doesn’t work in theory.”*

Ben Bernanke, Chairman of the Board, Federal Reserve

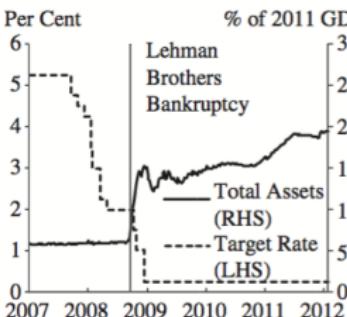
# What is unconventional monetary policy?

(a) Bank of England: Policy Rate vs. Balance Sheet



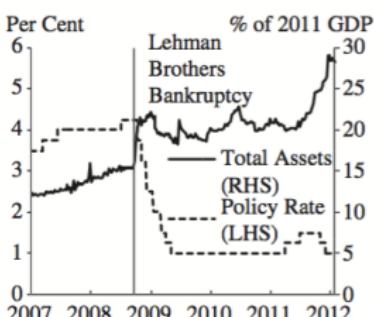
Sources: Bank of England and ONS

(b) US Federal Reserve: Policy Rate vs. Balance Sheet



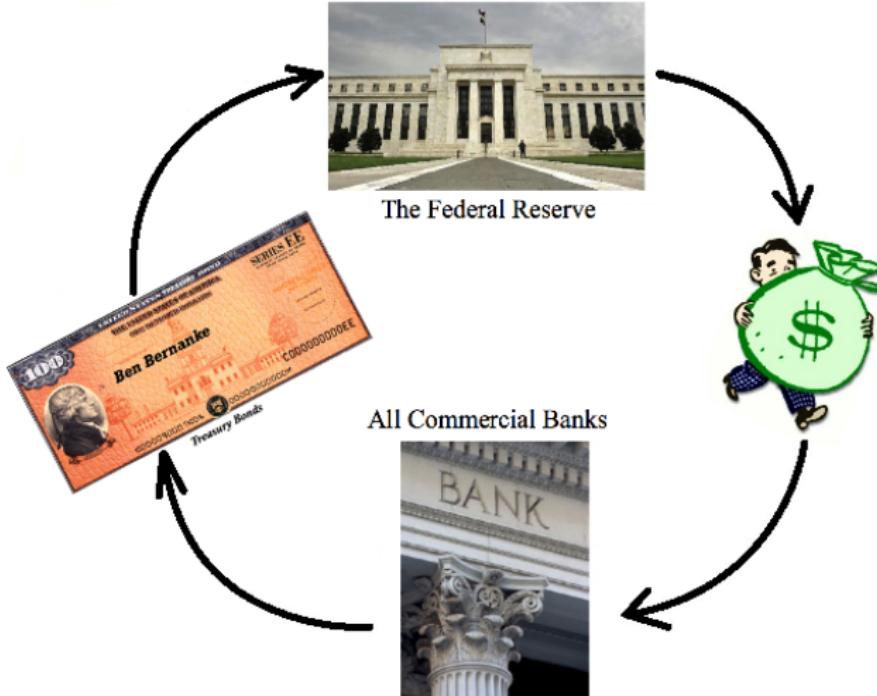
Sources: Bloomberg, Thomson Reuters Datastream, Federal Reserve and Bank of England calculations

(c) European Central Bank: Policy Rate vs. Balance Sheet

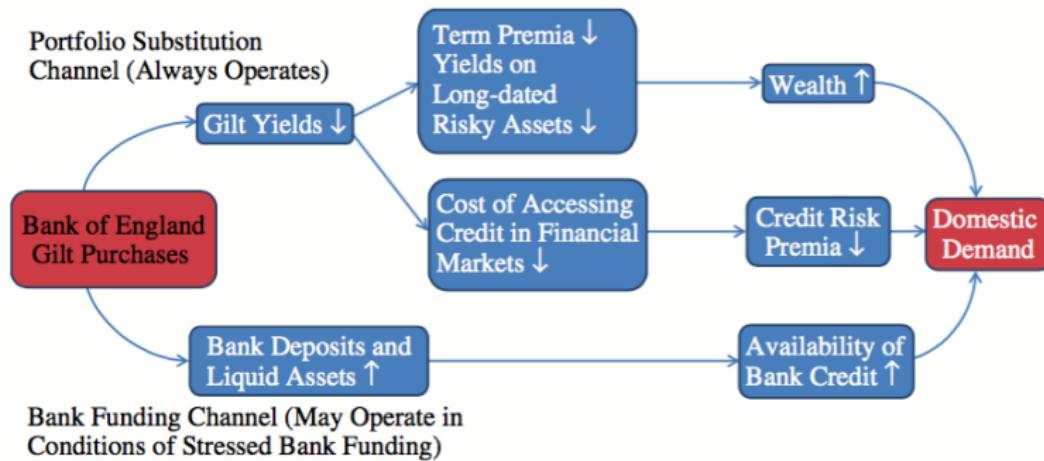


Sources: Bloomberg, Thomson Reuters Datastream, European Central Bank and Bank of England calculations

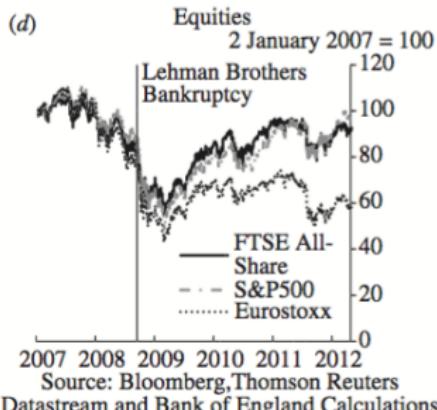
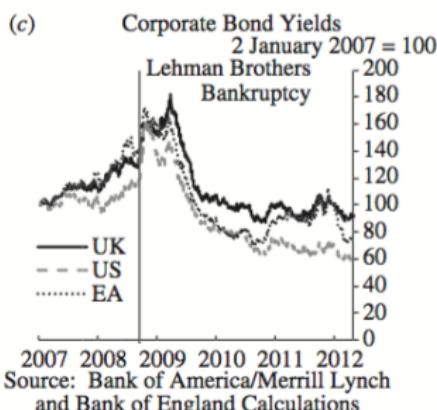
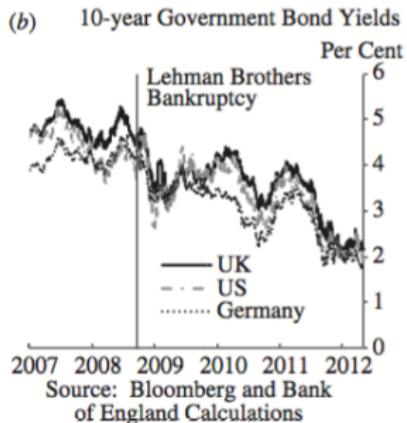
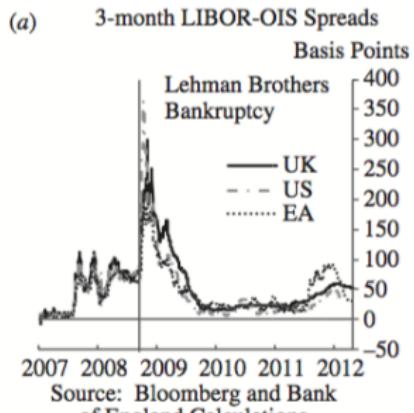
# Quantitative Easing - the basic idea



# How does QE work in theory?

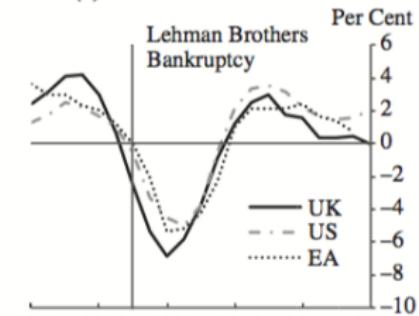


# How did QE affect the financial system?



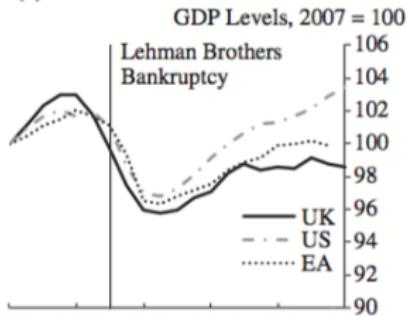
# How did QE affect the real economy?

(a) Annual Real GDP Growth



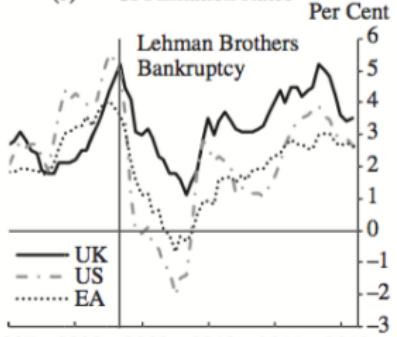
Source: ONS, Thomson Reuters Datastream  
and Bank of England Calculations

(b) Real GDP Levels



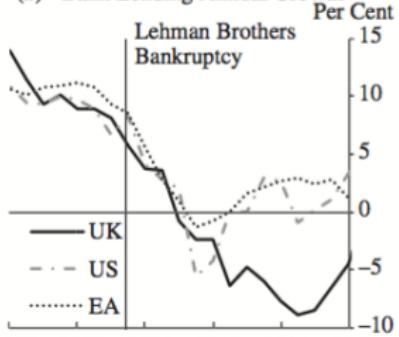
Source: ONS, Thomson Reuters Datastream  
and Bank of England Calculations

(c) CPI Inflation Rates



Source: ONS, Thomson Reuters Datastream  
and Bank of England Calculations

(d) Bank Lending Annual Growth



Source: Thomson Reuters Datastream, Federal Reserve, European Central Bank and Bank of England Calculations

## Central banks and the future of the federal reserve system

- ▶ The Federal Reserve is a large private corporation (SARB is also privately owned)  
⇒ limits the short run political influences on an economy
- ▶ Dodd-Frank leaves the Fed independent
  - ▶ Key influence in monetary policy
  - ▶ Supervision and regulation of individual financial institutions
  - ▶ Supervision and regulation of the financial sector
  - ▶ Its limitation is that it has to answer to congress

## Central banks and the future of the federal reserve system

- ▶ The central bank has full control over monetary policy
- ▶ It achieves lower and less volatile inflation rates at no long run cost to output
- ▶ Under the supervision and regulation of the financial sector, it acts as a lender of last resort
- ▶ Used to identify risks to financial stability in the US

## Day 3 Session 5

Central banks response 2: Financial stability and systemic risk

## Policy following the global financial crisis

as the crisis worsened, almost every country in the world became affected through second round effects, via a decline in consumer confidence which negatively impacted world trade.

The main debate globally was the role of monetary policy and the fact that whilst flexible inflation targeting was the most appropriate way to achieve monetary policy objectives in the past, this was no longer the case.

There was wide consensus that central banks should adopt a set of multiple objectives:

- ▶ maintain price stability
- ▶ support long-term economic growth and stable employment while still preserving the medium term price stability objective
- ▶ promote financial stability in the financial system

The most recent crisis showed that price stability was not a pre-condition for financial stability (IMF,2013a).

Source: Crisis Offers Preliminary Lessons on Fiscal Policy. IMF Survey online, September 2013.

## US - Financial stability in 2009

- ▶ Treasury issued a “Blueprint for a modernized financial regulatory structure” in March 2008
- ▶ Blueprint motivated reform, points out that much of the existing regulatory structure was created more than 70 years ago, and that this structure now “grapples to keep pace with market evolutions” and “faces increasing difficulties in preventing and anticipating financial crises”
- ▶ For example, the US regulation of deposit-taking institutions is characterized by an ineffectual web of agencies, with five federal agencies needing to coordinate between each other in the regulation and resolution of national banks, as well as with state authorities
- ▶ Under the Blueprint proposals, the Fed is to become the overall “market stability regulator.”
- ▶ →This gives the Fed a formal responsibility for overall financial stability as well as “broad powers” focusing on the overall financial system.

## US and financial stability

- ▶ powers of the Fed include
  - ▶ authority to collect information from individual institutions
  - ▶ to collaborate with other institutions in rulemaking
  - ▶ to take corrective action when this is required to preserve overall financial stability
- ▶ Blueprint also envisages for the Fed to have a more formal role in the oversight of payment systems, enabling it to “designate” such systems that it deemed systemically important, so as to subject them to formal oversight.
- ▶ A separate federal prudential regulator would oversee all deposit-taking institutions as well as insurance companies, both of which are envisaged to continue to enjoy explicit government guarantees.
- ▶ The conduct of business regulator would oversee market practices across the financial industry, including securities, insurance, and banking.

## UK and financial stability in 2009

- ▶ in response to the experience in dealing with Northern Rock, the authorities issued a consultation paper in July 2008 to strengthen the U.K. framework for financial stability.
- ▶ envisaged a strengthening of the role of the BOE in financial stability, giving it a formal statutory responsibility for financial stability and a leading role in the implementation of a special resolution regime for banks
- ▶ Banking Act 2009 formalizes the role of the BOE in the resolution of financial institutions.
- ▶ It also introduces statutory powers for the central bank in its oversight of systemically-important payment and settlement systems.
- ▶ Greater powers on the part of the BOE will be associated with greater independent accountability: oversight of the BOE's actions in financial stability will be provided by a new Financial Stability Committee (FSC) as a committee of Court (the nonexecutive supervisory board of the BOE).
- ▶ In addition, steps are being taken to improve the bank's

## Germany and Financial Stability in 2009

- ▶ Subprime-related losses (e.g., at Landesbanken, such as Sachsen LB and WestLB, as well as at IKB and Hypo Real), have led to debate on the supervisory framework and the effectiveness of the existing bank resolution framework.
- ▶ Bundesbank and BaFin have long shared a joint responsibility for banking supervision, but there had been a perception that the division of labor had lacked clarity and transparency, leading to potential duplication of effort, undue bureaucratic delay, and the danger that problems might fall through the cracks.
- ▶ new MOU issued in Feb 2008 is meant to clarify the responsibilities of the two agencies and to improve inter-agency cooperation

## Euro area and Financial Stability in 2008

- ▶ In Euro area as a whole, a report from a high-level group issued recommendations intended to overhaul the European structure of financial regulation and supervision.
- ▶ While day-to-day supervision would remain with national authorities, the recommendations contain three new elements:
  1. a macroprudential authority (ESRC), chaired by the ECB and composed of members of the ESCB General Council—that is all EU member countries' central banks—in addition to the European Commission and the chair of CEBS (Committee for European Banking Supervision)
  2. a microprudential authority (ESFS) comprising banking, insurance, and securities committees (CEBS, CEIOPS, and CESR); and
  3. a strengthening of the sectoral committees (CEBS, CEIOPS, and CESR) that promotes them to “authorities,” endowed with specific powers, to ensure the consistency of supervision across Europe.

Day 3 session 6  
US regulatory response: "Legislation US 2"

## Dodd-Frank reform and consumer protection act

- ▶ The Dodd-Frank Wall Street Reform and Consumer Protection Act was signed into federal law in 2010, passed as a response to the 2007-2008 financial crisis
- ▶ Its goal is to address the increasing propensity of the financial sector to put the entire system at risk and eventually need to be bailed out at taxpayer expense

## Dodd-Frank reform and consumer protection act

Major components of the act include:

- ▶ Identifying and regulating systemic risk
  - ▶ Sets up a Systemic Risk Council that can deem non-bank financial firms as systemically important, regulate them, and, as a last resort, break them up
  - ▶ Establishes the Financial Stability Oversight Council, under the US Treasury responsible for collecting, analyzing, and disseminating relevant information for anticipating future crises
- ▶ Expanding the responsibility and authority of the Federal Reserve by granting it authority over all systemic institutions and responsibility for preserving financial stability.

## Dodd-Frank reform and consumer protection act

- ▶ Proposing an end to too-big-to-fail by requiring funeral plans and orderly liquidation procedures for unwinding of systemically important institutions, ruling out taxpayer funding instead requiring that costs be borne by shareholders and creditors, and if required, ex post levies be imposed on other (surviving) large financial firms
- ▶ Reinstating a limited form of Glass-Steagall by limiting bank holding companies to minimal investments in proprietary trading activities, and prohibits them from bailing out these investments.

## Prudential standards

- ▶ The act calls for stricter prudential standards for SIFIs based on:
  1. Extent of leverage of the firm
  2. Nature of off-balance-sheet exposure
  3. Nature of transactions of the company
  4. Relationship with other significant non-bank financial companies
  5. Source of credit
  6. Extent to which assets are managed
  7. Nature, scope, size , scale, concentration and connectedness
  8. Degree to which it is already regulated
  9. Amount and nature of financial assets
  10. Amount and type of liabilities

## Policies used to regulate financial companies

- ▶ One of the main drivers of a firm's contribution to systemic risk is the co-movement of its assets with those of the aggregate financial sector during a crisis
- ▶ Policies used to regulate financial companies:
  1. Risk-based capital requirements
  2. Leverage limits
  3. Liquidity requirements
  4. Resolution plan and credit exposure report requirements
  5. Concentration limits
  6. A contingent capital requirement
  7. Enhanced public disclosures
  8. Short-term debt limits
  9. Overall risk management requirements

## Evaluation of the Dodd-Frank Act (from SR perspective)

The classification based criteria for determining systemic institutions can be supplemented with market based measures of systemic risk:

- ▶ Stock market data can be used to identify firms with greater exposure to losses in a crisis
- ▶ This helps to prevent regulatory arbitrage
- ▶ Method one: Marginal expected shortfall (MES)
- ▶ Estimates the loss of equity a firm can expect during a crisis
- ▶ A high MES indicates greater risk of bankruptcy or regulatory intervention

## Evaluation of the Dodd-Frank Act (from SR perspective)

Market based measures of systemic risk:

- ▶ Method two: Look at the interconnectedness of firms
- ▶ Understanding interconnectedness is key to measuring systemic risk, as its precise nature may be entirely different in a stressed scenario
- ▶ This can be achieved through the creation of a report detailing the exposure of firms to other institutions through derivative contracts and interbank liabilities
- ▶ This requires legislation that compels reporting
- ▶ Criteria when looking at each important institution:
  1. Look at dominant risk factors
  2. Look at counterparties in terms of potential exposure to stress

Challenge: financial interconnectedness

## Stress tests

- ▶ A stress test is a probabilistic scenario analysis to determine the needed capital buffer in a crisis
- ▶ The Dodd-Frank Act calls for systemic institutions to be subject to periodic stress tests
- ▶ Stress tests require a fully transparent approach
- ▶ Benefit of transparency:
  1. Releases valuable capitalization information
  2. Counter-party exposure information will also be available
- ▶ This testing helps to address operational risk
- ▶ Operational risk is typically attributed to deficiencies in corporate processes, its people and technology

## Two Forms of Systemic Risk

- ▶ Example of **contagion** vs. common shocks through a **fire-sale mechanism**.

Assets		Liabilities	
Loans to Customers	100	Retail Deposits	130
Loans to B	30	Borrowing from B	30
Loans to C	30	Borrowing from C	30
Other securities	40	Equity Capital	10
Total	200		200

Table 1: Balance sheet of bank A

Assets		Liabilities	
Loans to Customers	100	Retail Deposits	130
Loans to A	30	Borrowing from A	30
Loans to C	30	Borrowing from C	30
Other securities	40	Equity Capital	10
Total	200		200

Table 2: Balance sheet of bank B

Assets		Liabilities	
Loans to Customers	100	Retail Deposits	130
Loans to A	30	Borrowing from A	30
Loans to B	30	Borrowing from B	30
Other securities	40	Equity Capital	10
Total	200		200

Table 3: Balance sheet of bank C

- ▶ The banks are **completely symmetric** w.r.t. deposits, borrowings, securities and equity.

### The domino case

- ▶ Suppose that A makes a **loss** of 40 on its loans.
- ▶ This **wipes out** its equity.
- ▶ It has a **shortfall** of 30 on its liabilities.
- ▶ This shortfall is divided up amongst B and C, each suffering a shortfall of 15 on their **interbank lendings**.  
    ⇒ **B and C are wiped out as well!**

## Beyond the domino model...

- ▶ Bank A makes **losses** of 5 on it's loan book, halving it's **equity capital** to 5.
- ▶ The **leverage ratio** (ratio of assets to equity capital) of A increases from 20 ( $200/10$ ) to 39 ( $195/5$ ), putting the bank close to, or below the **capital adequacy ratio**.
- ▶ This forces A to sell some of it's securities.
- ▶ They were originally worth 40, but since A has to get rid of them in a **fire-sale**, the bank sells half of them and recoups only 18.
- ▶ This reduces the bank's equity capital to 1.

## Beyond the domino model (ctd.)...

- ▶ B and C are now hit with **two problems**:
  1. Since A has been selling its securities in a fire-sale, the securities of B and C are now worth only 36. This **reduces their equity capital** to 6.
  2. Needing to shrink their balance sheets and worried about A's solvency, they decide **not to roll-over their loans** to A.
- ▶ A now has to repay the loans to B and C, but with **almost no equity** and the **value of its securities falling**, it fails to do so.
- ▶ B and C now realize losses on their loans to A and also on their securities.

⇒ **B and C are just as vulnerable as A**

## Taxing Systemic Risk

## Systemic risk and the financial crisis

- ▶ The stock market declined by 42% in the US during the crisis
- ▶ Global GDP declined by 0.8%
- ▶ Some financial institutions contributed more to the failure than others
- ▶ This contribution of the capital shortfall represents a negative externality
- ▶ A way to remove this would be the introduction of a tax on the systemic risk of financial firms

- ▶ This is opposite to what Dodd-Frank Act does
- ▶ Rather than taxation, they focus on governments ability to contain systemic risk through the design of capital adequacy requirements
- ▶ Systemic risk taxation needs to be equally imposed across the financial sector
- ▶ Interconnectedness of financial sector means every financial firm gets affected by one firms decline in equity
- ▶ Financial firms:
  1. Commercial banks
  2. Investment banks
  3. Money market funds
  4. Insurance firms
  5. Hedge funds
  6. Private equity firms

## Three challenges to regulating systemic risk

- ▶ Identify and measure systemic risk
- ▶ Develop an optimal policy to have firms internalize systemic risk costs
- ▶ Ensure that the policy can be implemented

## Model

- ▶ Banking system where each bank has limited liability and maximizes shareholder value
- ▶ Regulators provide a safety net for financial firms
- ▶ Systemic risk emerges when the banking sector's equity capitalization is lower than a fraction of its total assets
- ▶ Costs of systemic risks are proportional to the size of this shortfall
- ▶ This implies that taxing individual banks is optimal

## Systemic risk tax

- ▶ Systemic risk tax is calculated by:
  1. Expected loss of firm upon default: Financial firms must pay for guarantees they receive
  2. Expected systemic costs in a crisis multiplied by firm contribution to costs: The risk needs to be priced and the financial firms need to internalize the costs of a negative externality

## Difficulties implementing policy

Measuring systemic risk:

- ▶ It is the fraction of expected losses made by financial firms in a systemic event
- ▶ Expected systemic cost: Measures the level of systemic risk
- ▶ It is the % contribution of the institute to costs occurred in a financial sector collapse

## Implementing tax on systemic risk

- ▶ There are two schemes to charge for systemic risk:
  1. Market-based discovery of the price of systemic risk insurance
  2. Direct regulatory tax
- ▶ Empirically, it is based on time series data as to what causes a crisis
- ▶ Mainly, by calculating the probability of a crisis occurring
- ▶ The following is taken into account when calculating the probability of a crisis:
  1. System-wide leverage
  2. Asset bubbles
  3. Market volatility

- ▶ By measuring the costs of past crises and the probability of a crisis results in finding expected costs
- ▶ The advantage is that regulators can adjust expected costs, making them countercyclical
- ▶ It can then be used to determine which institutions contribute to risk
- ▶ As well as the firms contribution to sector-wide equity losses when the sector fails
- ▶ It can be observed in the table as follows

Firm (7/1/07)	SRISK%	MES	Firm (9/12/08)	SRISK%	MES
Citigroup	14.3	3.27	Citigroup	13.1	6.17
Merrill Lynch	13.5	4.28	Bank of America	10.9	6.33
Morgan Stanley	11.8	3.25	AIG	10.9	10.86
JPMorgan Chase	9.8	3.44	JPMorgan Chase	9.7	5.20
Goldman Sachs	8.8	3.60	Merrill Lynch	6.5	6.86
Freddie Mac	8.6	2.35	Wachovia	6.5	9.61
Lehman Brothers	7.2	3.91	Morgan Stanley	5.9	4.87
Fannie Mae	6.7	2.47	Lehman Brothers	5.2	15.07
Bear Stearns	5.9	4.40	Goldman Sachs	4.8	3.58
MetLife	3.6	2.57	Wells Fargo	3.4	5.40

Figure 1: Risk measures for the most systemic financial firms

- ▶ Provides risk measures from the top 100 systemic financial firms
- ▶ During July 2007 and September 2008, firms not only fail but also create most of the systemic risk
- ▶ It can be seen that most of the systemic risk is captured by a few firms
- ▶ The increase in the MES measure indicates the start of a crisis
- ▶ Regulators estimate the % contribution of each financial firm to aggregate capital shortfall of the financial sector
- ▶ If implemented correctly, financial firms would optimally choose to be less levered and hold less systemic risky assets

## Moral hazard

- ▶ Moral hazard is mitigated under taxation because government prices and charges for both firm risk and systemic risk
- ▶ However, firm behavior is unobservable hence premiums on systemic risk is set
- ▶ As well as capital requirements and restrictions are imposed
- ▶ This results in firms imposing its own behavior
- ▶ It imposes a penalty function in bad states to avoid excessive risk taking by firms
- ▶ The problem with this is that a system of limited liability imposed is irrelevant as shareholders are mitigated

## Dodd-Frank Act

- ▶ This act addresses systemic risk differently to direct tax regulation
- ▶ It prefers to manage systemic risk
- ▶ Disadvantage of using this approach is that it won't reduce systemic risk sufficiently as it may shift to another part in the system
- ▶ Effectiveness of the act and how it analyzes it:
  1. Identify and measure systemic risk
  2. Uses systemic risk to create an optimal policy
  3. Ensure that the policy has no future regulatory arbitrage and eliminates moral hazard

## Measuring of systemic risk

A firm is systemic if:

- ▶ Material financial distress at company level can pose a threat to financial stability
- ▶ Nature, scope, size, scale, concentration, interconnectedness or a mix of company's activities affect financial stability as a whole
- ▶ In particular, regulators look at:
  1. Amount and nature of company's financial assets
  2. Amount and nature of company's financial liabilities
  3. Extent of company's leverage
  4. Extent and nature of off-balance sheet exposures
  5. Transactions and relationship with other financial firms
  6. As a source of credit for households, businesses, state and local government
  7. Degree at which a company is regulated
- ▶ However, omitting the co-movement of a firm's asset returns with aggregate financial sector during a crisis

## Reducing systemic risk

Reducing systemic risk is done by implementing stricter standards such as:

- ▶ Risk-based capital requirements
- ▶ Leverage limits
- ▶ Liquidity requirements
- ▶ Contingent capital requirements
- ▶ Resolution plan and credit exposure reports
- ▶ Enhanced public disclosures
- ▶ Concentration limits
- ▶ Short-term debt limits
- ▶ Risk management requirements

## Mitigating moral hazard

- ▶ The Dodd-Frank Act fails when it comes to moral hazard due to the free rider problem
- ▶ Free-rider problem: Firms that have large amounts of systemic liabilities aren't allowed to fail by regulators

## Tax on systemic risk

Public-private insurance plan is required:

- ▶ Regulated firms would have target capital of current assets
- ▶ Allows regulators to determine the proportionate share of expected losses contributed in a crisis
- ▶ Fees paid to insurance company's are negated from the firms total systemic tax
- ▶ Firms continuously pay tax and acquire insurance
- ▶ Future expected bailouts need to be priced separately

## Basel III and the Dodd-Frank Act

Improvements in the Dodd-Frank Act are possible as follows:

- ▶ Closing major capital loopholes
- ▶ Relying less on ratings agencies

Dodd-Frank Act improvements:

- ▶ Addresses conflict of interest between rating agency business model and governments regulatory reliance on ratings
- ▶ Includes off-balance-sheet activities in computing capital requirements
- ▶ With respect to derivatives:
  1. Margin requirements
  2. Reporting to data repositories
  3. Providing authority for prudential regulators

- ▶ It still doesn't take into account the effect of shifting financial activities elsewhere will have on the financial sector
- ▶ Purpose of Basel Accord: common risk-based assessment of bank assets and required capital levels
- ▶ Basel III:
  1. Stricter on what constitutes as capital
  2. Minimum leverage ratio
  3. Creates liquidity ratio that banks are required to abide by
- ▶ Basel III doesn't take into account shadow banking nor regulatory arbitrage

## Capital requirements

- ▶ Dodd-Frank Act and Basel III provide explicit maximum leverage ratio and minimum capital ratio's
- ▶ Risk-based capital and leverage capital ratio's will be applied to bank holding companies and systemically important institutions
- ▶ The current Basel II total capital ratio of 8% is expected to increase under Basel III as in the following table

	Well Capitalized	Adequately Capitalized
Tier 1 (risk-based capital ratio)	6%	4%
Total (risk-based capital ratio)	10	8
Leverage ratio	5	4

Figure 2: Capital adequacy standards

- ▶ These requirements are to be enacted within 18 months, exempting small institutions
- ▶ The definition of capital in Dodd-Frank Act and Basel III don't perfectly coincide, Leverage ratio in Basel III is lower, i.e. 3%
- ▶ Dodd-Frank Act goes further for SIFIs to "maintain a debt-to-equity ratio" of no more than 15 to 1 (leverage ratio of 6.5%)

- ▶ The act requires additional capital requirements as follows:
  1. Significant volumes of activity in derivatives, securitized products purchased and sold
  2. Volumes of activity in financial guarantees purchased and sold, securities borrowing, repurchase agreements and reverse repurchase agreements
- ▶ Concentrations in market share for any activity that disrupts financial markets
- ▶ Common in the Dodd-Frank Act and Basel III: Establishes capital regulations that have to be countercyclical
- ▶ This allows for the amount of capital required to be maintained by a company, increases in times of economic contraction, consistent with safety and soundness of a company

## Limitations

- ▶ Belief that higher capital requirements are costly
- ▶ Capital is defined as equity capital
- ▶ The value of a firm's assets will be independent of how those assets were financed
- ▶ How to accurately measure leverage at institution level
- ▶ Depends on whether one believes the agency problems of LCFI's are due to conflict of interest
- ▶ Banks dislike capital requirements

- ▶ Dodd-Frank Act and Basel III don't look at why equity financing is more costly than debt financing
- ▶ Examples:
  1. Number of firms used an accounting loophole to temporarily reduce reported leverage
  2. Lehman Brother's repo 150 activities reduced reported leverage by 50 billion dollars
  3. April 2010: NY Federal reserve bank showed 18 banks decline their net short-term borrowings in the repo market

## Liquidity requirements

- ▶ Arises because regulated institutions have fragile structures i.e. holding assets within long-term duration or low liquidity
- ▶ Liabilities are highly liquid in the short term
- ▶ Imposes liquidity requirements to reduce a run
- ▶ Requires a proportion of short-term funding must be liquid assets
- ▶ This decreases the probability of runs because
- ▶ These institutions take on carry trades and holding long-term asset-backed securities

Basel III outlines two ratios that financial institutions as:

- ▶ Liquidity coverage ratio: bank's high-quality liquid assets as a ratio of their net cash flow over a 30 day period
- ▶ Net stable funding ratio: amount of stable funding over required amount of stable funding
- ▶ Assumes that the probability and size of losses associated with default are similar between the two classes of securities

# Capital

How to measure the capital of a financial institution:

- ▶ Regulatory capital represents a buffer against a decline in the value of a firm's assets against its obligations
- ▶ Doesn't contain a significant debt feature: commitment for future repayment
- ▶ According to the Dodd-Frank Act allows to conduct a study of the use of hybrid capital instruments as a component of Tier 1 capital for banking institutions
- ▶ Basel III includes a fraction (15%) of Tier 1 capital to include equity investments, mortgage servicing right and deferred tax assets

## Example

- ▶ Trust preferred securities (TruPSs) are hybrid securities that have debt and equity securities
- ▶ Holding company issues junior subordinated debt to a trust security (has a 100% ownership of trust)
- ▶ Guarantees that an interest and principal payment of the TruPSs
- ▶ It doesn't have characteristics that are required for securities included in Tier 1 capital
- ▶ Dodd-Frank Act requires banks to phase out TruPSs
- ▶ It gives banks with more than 100 billion dollars in capital to phase out these securities
- ▶ Up to 10 years for institutions with capital between 15 billion and 100 billion dollars

## Contingent capital

- ▶ It is a hybrid claim that allows for there to be debt in good times but automatically converts it into an equity claim in bad times (uninsured)
- ▶ Example.1: Lloyd's bank issued capital in November 2009 as part of its capital raising program
- ▶ It ensures banks maintain a sufficient level of capitalization

## **BOX 6.1 LLOYDS BANK ISSUE OF ENHANCED CAPITAL NOTES**

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In November 2009, Lloyds Bank issued £5.5 billion of contingent capital. These securities, called enhanced capital notes (ECNs), are debt securities that convert to common equity when the bank's Tier 1 capital ratio falls to 5 percent. The ECN issue was intended to inject much-needed capital and to avoid the government taking larger stakes in the company.

The issue was significantly oversubscribed and the bank decided to increase the issue amount from the initial £5.5 billion to £7.0 billion. Vermaelen and Wolff (2010), however, point out that the Lloyds Bank CoCo bond issue was an exchange offer wherein investors in the ECN received 1.5 percent to 2.5 percent of additional coupon income in exchange for senior capital. Additionally, while European Union rules restricted payments to hybrid capital securities for firms receiving financial aid, the newly issued ECNs were not subject to such restrictions. In effect, hybrid security holders who were eligible for the exchange offer had the choice of either forgoing income or switching to

the ECNs. It is unclear how markets would have reacted in the absence of such incentive.

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<b>Issuer</b>	Lloyds TSB Bank/Lloyds Banking Group
<b>Status and Ranking</b>	Direct, unsecured, and subordinated obligations of the relevant issuer and rank pari passu
<b>Maturity</b>	10, 12, or 15 years depending on existing security exchanged for
<b>Interest</b>	Premium of between 1.5 percent and 2.5 percent above the interest rate or dividend rate
<b>Trigger Event</b>	Bank's Tier 1 capital ratio falls to 5 percent
<b>Conversion Price</b>	At market price of stock when trigger is hit

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*Source:* Lloyds Banking Group (2009).

## Example.2: Rabobank issued capital on march 2010

### **BOX 6.2 RABOBANK ISSUE OF SENIOR CONTINGENT NOTES**

In March 2010, Rabobank issued €1.25 billion of benchmark 10-year fixed-rate senior contingent notes (SCNs). The securities were priced at an annual coupon of 6.875 percent. The issue was more than twice oversubscribed at €2.6 billion.

The SCNs convert to equity when the equity capital ratio falls below 7 percent. Unlike the Lloyds Bank ECNs, the Rabobank SCNs, when triggered, convert to 75 percent of original principal. Conversion is based on market value but at a discount, making it antidilutive. The Rabobank bond can be thought of as a catastrophe bond (cat bond), which when triggered transfers the risk from the issuer to the investor.

<b>Issuer</b>	Rabobank Nederland
<b>Status and Ranking</b>	Senior unsecured—ranking senior to all subordinated (Tier 2 and Tier 1) capital of the issuer
<b>Maturity</b>	5/10-year bullet—March 2015/2020
<b>Interest</b>	Fixed rate 6.875 percent paid annually
<b>Trigger Event</b>	Equity capital ratio is less than 7 percent
<b>Conversion Price</b>	To 75 percent of the original principal amount plus accrued and unpaid interest

*Source:* Rabobank Group (2010).

## Contingent capital

- ▶ Ability to limit ex ante risk-taking and buildup of systemic risk
- ▶ Useful to deal with distress when complex contingents characterize a firm's balance sheet
- ▶ Relative attractiveness to standard capital and liquidity requirements
  
- ▶ However, not able to come up with international standards of banking regulation
- ▶ As well as it is not adequate for containment of ex post distress in all contingencies

# Summary of various contingent capital schemes and key features

Source	Type	Trigger	Equity/ Credit Market Trigger	Book/ Market Value Trigger	Drawback
<b>I. Contingent Capital</b>					
Duffie (2009)	1. Reverse convertible debenture (RCD) 2. Mandated rights offering	1. Market value of equity 2. Liquidity measures	Equity	Market	Equity holders may demand excessive premiums in rights, limiting liquidity raised
Flannery (2005)	Reverse convertible debenture	Market capital ratio	Equity	Market	Manipulation by bondholders
Flannery (2009 a)	Contingent capital certificates (CCC)	Equity ratio. Fixed share premium conversion	Equity	Market	Dilutes the disciplining effect of debt
Flannery (2009 b)	Contingent capital certificates (CCC)	Equity ratio	Equity	Market	Manipulation by bondholders
Hart and Zingales (2009)	Equity injection based on CDS prices	CDS prices and regulator discretion	Credit	Market	Regulator reluctance, death spiral
McDonald (2010)	Debt-to-equity conversion with double trigger	1. Stock price 2. Financial institution index	Equity	Market	Manipulation by bondholders

## Summary continued

Squam Lake Working Group (2009)	Debt-to-equity conversion with double trigger	1. Systemic event determined by regulator 2. Bank capital adequacy measures	Equity	Book	Regulator reluctance, death spiral
Vennaelen and Wolff (2010)	Call option enhanced reverse convertible (COERC)	Market value based	Equity	Market	Dilutes disciplining effect of debt
<b>II. Contingent Capital Insurance</b>					
Acharya, Pedersen, Philippon, and Richardson (2010b)	Contingent capital insurance based on firm's losses in a systemic event	Aggregate market or financial institution index	Market	Counterparty risk of insurance sector	
Kashyap, Rajan, and Stein (2008)	Contingent capital insurance based on risk-weighted asset value	Aggregate bank losses except covered bank	Book	Regulator reluctance	
<b>III. Liability-Enhanced Equity</b>					
Acharya, Mehran, and Thakor (2010)	Liability-enhanced equity	Bankruptcy	Book	Liability increased only if firm has significant earnings	
Admati and Pfleiderer (2009)	Liability-enhanced equity	Face value of liabilities	Book	Cumbersome to implement	

## Contingent capital injection

- ▶ Based on reverse convertible debenture
- ▶ It is debt that converts into equity when triggered
- ▶ Schemes differ on the type of trigger
- ▶ Triggers:
  1. Rule-based: On books/market value subject to opportunistic manipulation by bondholders
  2. Discretionary trigger: based on aggregate market measures
- ▶ leads to a rapid decline in prices i.e. death spiral

## Contingent capital insurance

- ▶ Tax based on bank's own contribution to systemic risk
- ▶ Taxes go to a regulator and when a systemic even occurs the regulator determines which firms receive support
- ▶ Liability enhanced equity: an increase in liability is associated with equity
- ▶ Regulators impose higher capital requirements

## Large banks and the Volcker rule

## Overview

- ▶ Most of the systemic risk in the United States today is from the six largest bank holding companies — Bank of America, JPMorgan Chase, Citigroup, Wells Fargo, Goldman Sachs, and Morgan Stanley
- ▶ These large, complex financial institutions (LCFIs) will still report to the same regulators as before, whose effectiveness in averting prior crises was sorely lacking
- ▶ LCFIs can be defined as financial intermediaries engaged in some combination of commercial banking, investment banking, asset management, insurance, and/or the payments system, whose failure poses a systemic risk to the financial system as a whole
- ▶ The following table lists the market value and assets of the largest 24 US financial firms in June 2007
- ▶ Shows that US based LCFIs include not just commercial banks but other such financial intermediaries

Financial Firm	Assets	Market Equity	Assets/ Equity	Contribution	Cumulative Proportion
Citigroup Inc.	\$2,347.4	\$253.7	9.3	10.9%	10.9%
Bank of America Corp.	1,618.4	217.0	7.5	7.5	18.4
JPMorgan Chase & Co.	1,504.3	165.5	9.1	7.0	25.4
Morgan Stanley Dean Witter & Co.	1,250.0	88.4	14.1	5.8	31.2
Merrill Lynch & Co. Inc.	1,111.3	72.6	15.3	5.2	36.4
American International Group Inc.	1,111.2	181.7	6.1	5.2	41.6
Goldman Sachs Group Inc.	996.4	88.5	11.3	4.6	46.2
Federal National Mortgage Ass'n	889.7	63.6	14.0	4.1	50.3
Federal Home Loan Mortgage Corp.	843.1	40.2	21.0	3.9	54.2
Wachovia Corp.	748.7	98.1	7.6	3.5	57.7
Lehman Brothers Holdings Inc.	625.3	39.5	15.8	2.9	60.6
Wells Fargo & Co.	610.0	117.5	5.2	2.8	63.5
MetLife Inc.	566.8	47.8	11.9	2.6	66.1
Prudential Financial Inc.	483.9	45.0	10.7	2.2	68.3
Bear Stearns Companies Inc.	427.0	16.7	25.6	2.0	70.3
Hartford Fin'l Services Group Inc.	358.2	31.2	11.5	1.7	72.0
Washington Mutual Inc.	326.1	37.6	8.7	1.5	73.5
Berkshire Hathaway Inc.	272.8	119.0	2.3	1.3	74.8
U.S. Bancorp.	260.5	57.3	4.5	1.2	76.0
Countrywide Financial Corp.	224.0	21.6	10.4	1.0	77.0
American Express Co.	196.4	72.7	2.7	.9	77.9
Lincoln National Corp Inc.	195.0	19.2	10.2	.9	78.8
Suntrust Banks Inc.	194.0	30.6	6.3	.9	79.8
Allstate Corp.	176.3	37.4	4.7	.8	80.6

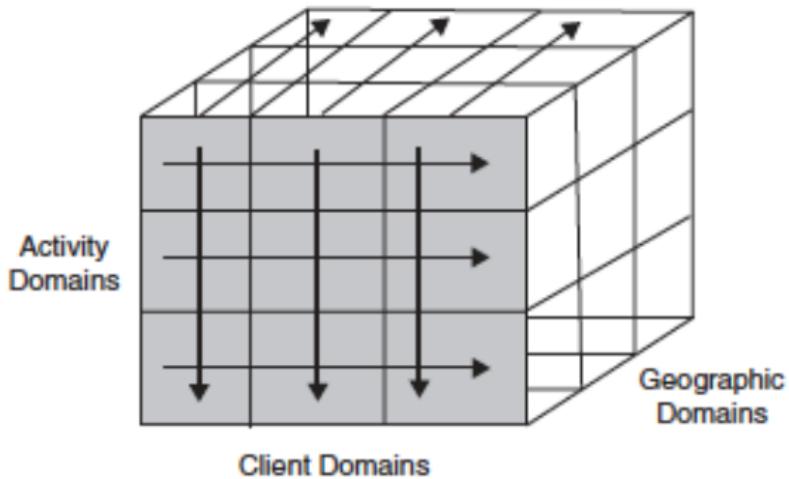
Figure 3: Market value and assets of 24 US firms in 2007

## LCFIs and the financial crisis

- ▶ The financial crisis caused systemic failure despite central bankers implementing risk-adjusted minimum capital adequacy standards for banks
- ▶ The crisis spread from the banking sector to the financial world to the real economy, driving it into a steep recession
- ▶ Most of the LCFIs survived because they managed to shift risks by exploiting loopholes in regulatory capital requirements
- ▶ This was financed largely by debt holders who correctly anticipated de facto government guarantees
- ▶ Included insured and uninsured depositors and creditors

## The economics of LCFIs and its model

- ▶ The structural form of competition between firms active in a given financial intermediation function or in multiple functions should have a comparative advantage in that area
- ▶ If there are significant economies of scale or economies of scope with respect to either costs or client segments, there are advantages in the size, the range of activities, or the geographic scope or client breadth of those firms that are the most successful
- ▶ The following figure shows the market for financial services as a matrix of clients, products, and geographies



**Figure 4:** Market for financial services as a matrix of clients, products, and geographies

- ▶ Financial firms want to allocate available resources to those cells in the matrix (market segments) that promise to yield the highest risk-adjusted returns
- ▶ Attribute costs, returns, and risks appropriately to specific cells in the matrix
- ▶ The cells themselves must be linked together in a way that recognizes and maximizes synergies
- ▶ Client-driven linkages (horizontal arrows in the figure) exist when a financial institution can supply financial services more efficiently to either the same or another client in the same group in the same or different geographies

- ▶ Risk mitigation results from spreading exposures across clients
- ▶ It includes greater earnings stability to the extent that income streams from different clients or client segments are not perfectly correlated
- ▶ Product-driven linkages (vertical arrows) exist when a firm can supply a financial service in a more competitive manner
- ▶ Again, risk mitigation is to the extent that net revenue streams from different products are not perfectly correlated
- ▶ Geographic linkages (lateral arrows) are important when an institution can service a particular client or supply a particular service more efficiently in one geography
- ▶ To get maximum returns from this strategic positioning matrix, firms need to know the size, growth and competitive dynamics of specific market segment
- ▶ As well as, the costs and the risks embedded in their overall portfolio of activities

- ▶ The existence of large and complex systemic financial intermediaries suggests one of several possibilities:
  1. The benefits of size and complexity do in fact exceed their costs
  2. there are widespread failures in market discipline and effective corporate governance
  3. size and complexity result in an unpriced subsidy representing a transfer of wealth from society at large to the shareholders and employees of financial intermediaries

## History of LCFIs

- ▶ For seven decades, LCFIs were banned from the U.S. financial system
- ▶ The Glass-Steagall provisions of the Banking Act of 1933 mandated a virtually complete separation of investment banking from deposit taking activities
- ▶ It eliminated involvement by firms with a commercial banking charter in the securities business
- ▶ Critics of the banking model feared that bank involvement in securities underwriting had led to increasing their holdings of long-term financial instruments, exposing them to potentially dangerous market, credit and liquidity risk
- ▶ This triggered the collapse of banks nationwide, which in turn had disastrous consequences for the real economy

- ▶ 40% of all US banks failed during this period, undermining their role as financial intermediaries and put the economy into a crisis
- ▶ The Glass-Steagall Act forced the dissolution of the universal banks
- ▶ US investment banks' share of financial intermediation grew rapidly as financial flows shifted to financial markets
- ▶ By the 1980s, the US financial system had become heavily market dominated
- ▶ While other financial systems remained dominated by universal banks
- ▶ Another consequence of Glass-Steagall is the progressive dominance of U.S. investment banks in rapidly evolving global capital markets
- ▶ By the late 1980s, commercial banks had gained the limited right to sell investment and insurance products to retail customers
- ▶ As well as the right to operate separately capitalized, size-constrained wholesale securities subsidiaries

- ▶ In 2009, the world's five largest wholesale banks were responsible for the origination of nearly 60% of all capital market transactions
- ▶ They accounted for 8.97 trillion of assets, or approximately 55% of all assets held in the entire US banking system
- ▶ These LCFIs are regulated by weighing the systemic risk of a particular functional activity undertaken by a financial institution against the benefit of that activity

## Framework to regulate LCFIs

Functions of firms that have systemic risk:

- ▶ They act as intermediaries i.e. dealers in security markets, repos, and over-the-counter (OTC) derivatives
- ▶ Conduct commercial banking — deposit taking and lending to individuals and institutions
- ▶ Operate investment banking businesses — underwriting security issues and providing advisory services
- ▶ Offer asset management services — managing assets for institutions and individuals
- ▶ Offer brokerage services to individuals, and prime brokerage for hedge funds and other professional investors
- ▶ Conduct proprietary trading — trading on their own accounts, which include internal hedge funds, private equity partnerships, or asset holdings of unhedged securities

- ▶ However, regulators need to identify the relevant cost benefit analysis of combining different financial activities
- ▶ Advantage of LCFIs is that the securities markets have become highly integrated and fluid as a result of securitization, global linkages, derivatives and new forms of market innovation
- ▶ A second argument is that to follow the Glass-Steagall approach in today's globalized marketplace, universal banking would have to be prohibited everywhere
- ▶ Overall, LCFIs create greater systemic risk

## Dodd-Frank Act

### Size constraints:

- ▶ There is the prohibition on the size of financial institutions through mergers if the combined firm's total liabilities exceed 10% of aggregate consolidated liabilities of all financial companies in the US
- ▶ Expected intense lobbying activity by firms actually or potentially subject to the 10% ceiling could have the limit raised, triggering even greater industry consolidation and exposure to systemic risk
- ▶ the US size constraint does reduce the growth prospects of such entities into ever larger firms even though it does not call for breaking up large financial institutions into smaller entities
- ▶ Any institution with more than 10% of the entire financial sector's liabilities is systemic
- ▶ The size cap would therefore help limit the too-big-to-fail problem

- ▶ The reverse is not true, as a number of institutions with less than 10% of liabilities in the system are also systemic
- ▶ After new prudential standards have been implemented, a financial firm represents a systemic threat
- ▶ Activities that constitute the source of that threat could be terminated, carved out or sold to separate unaffiliated financial firms
- ▶ Solutions to this:
  1. Terminating one or more activities
  2. Imposing conditions on the manner in which a financial holding company subject to stricter standards conducts one or more activities
  3. Limiting the ability to merge with, acquire, consolidate with, or otherwise become affiliated with another company
  4. restricting the ability to offer a financial services or products
- ▶ The disposal of specific LCFI holdings are last-resort measures that have to be approved by a two-thirds vote of the Financial Stability Oversight Council
- ▶ It also allows for bringing non-financial companies posing a systemic threat under the Federal Reserve regulatory umbrella

## Modified Volcker rule

- ▶ Any implicit federal guarantee should be limited to a relatively small number of important banking institutions and to core banking functions
- ▶ To include proprietary trading: engaging as a principal for the trading account of the banking entity or nonbank financial company supervised by the Board in any transaction
- ▶ LCFIs had already prepared the ground by arguing that proprietary trading operations were not the cause of the 2007 to 2009 financial crisis
- ▶ The 2009 balance sheets of the four largest banks — JPMorgan Chase, Bank of America, Citigroup, and Wells Fargo — shows holdings of 1.1 trillion dollars worth of available-for-sale securities
- ▶ An expanded Volcker Rule that extends the definition of proprietary trading to asset-backed security holdings by financial intermediaries

- ▶ Other institutions without guarantees such as mutual funds, pension funds, hedge funds, sovereign wealth funds, and non-systemic insurance companies can step into the breach as banks withdraw from the asset-backed security market
- ▶ The modified Volcker rule allows for ownership or sponsorship of hedge funds and private equity funds
- ▶ These businesses can be highly leveraged and are likely to falter in a crisis, thus adding to the systemic risk of the firm
- ▶ These internal businesses have access to leverage at below-market financing costs
- ▶ If the primary advantage for running internal hedge funds arises from their access to cheap financing due to implicit government guarantees of their debt, then both the benefits and the costs are carried by taxpayers

- ▶ The Dodd-Frank Act fails to incorporate the original Volcker Rule objective that LCFIs cease their sponsorship of hedge funds and private equity funds
- ▶ Implying that the risks of such affiliations exceed the gains in an environment that includes hedge fund and private equity fund cohorts
- ▶ Instead, LCFIs can continue to sponsor such funds and invest in them up to an amount equal to 3% of their capital
- ▶ The actual exposures associated with in-house hedge funds and private equity funds, including exposure to reputational risk, is far in excess of the nominal exposure, and that the original Volcker Rule is preferred
- ▶ In terms of international legislation on possible activity limitations and LCFI restructuring, the G20, BoE, FSA, ECB, BIS, FSB, IMF, OECD, and EU have all considered the regulatory options and the need for international coordination

- ▶ The EU Commissioner for Competition, which has mandated carve-outs by bailed-out financial conglomerates in order to restore a more competitive playing field
- ▶ Breaking up the largest LCFIs into smaller firms, has been proposed by the Bank of England
- ▶ The stock market has turned to a very skeptical view of LCFIs and their ability to recover the economic power, political influence, and stock market valuations
- ▶ At the time of the announcement of their second quarter results in 2010, the six largest US LCFIs traded at an average price-to-book value ratio of 0.9 times well below the 2 to 3 times price-to-book ratio they enjoyed before the crisis
- ▶ The more erratic and volatile price-to-earnings ratios of these six LCFIs averaged 14.7 in July 2010
- ▶ Overall, a firms' ability to abuse government guarantees intended for one activity by supporting riskier ones would be limited
- ▶ However, government guarantees having the effect of compromising market discipline and engendering future crises would have been alleviated



## Deposit insurance

- ▶ Deposits are lent out by banks (instead of just safe-keeping the full amounts)
- ▶ If banks' borrowers fail to repay loans - banks' creditors, including depositors, risk potential loss
- ▶ Banks in financial trouble face bank runs - customer deposits can (generally) be withdrawn with little or no notice
- ▶ Banking failures can trigger economic recessions etc
- ▶ → Deposit insurance
- ▶ critical role of explicit and privately funded deposit insurance in maintaining confidence in the financial system was once again confirmed during global financial crisis

## International Association of Deposit Insurers (IADI)

- ▶ Purpose: Share deposit insurance expertise with the world and contributing to the stability of financial systems as the standard setter for deposit insurance with a global and expanding membership
- ▶ non-profit organisation constituted under Swiss Law
- ▶ separate legal entity domiciled at the Bank for International Settlements (BIS) in Basel

- ▶ IADI currently represents 84 deposit insurers from 85 jurisdictions
- ▶ Out of 124 countries surveyed by they IADI in 2016:
  - ▶ 77 countries have Government legislated and administered deposit insurance
  - ▶ 26 countries have Government legislated and privately administered deposit insurance
  - ▶ 13 countries: Deposit insurance administered by the central bank
  - ▶ 3 countries: Privately established and administered
  - ▶ 5 countries: other

## Deposit insurance in the US - recap

- ▶ The 1933 Banking Act: Established the Federal Deposit Insurance Corporation (FDIC) as a government corporation.
- ▶ Initially each depositor insured for USD 2 500 per ownership category, and currently up to at least USD250 000 per insured bank
- ▶ Only banks are insured by the FDIC; credit unions are insured up to the same insurance limit by the National Credit Union Administration, which is also a government agency
- ▶ The FDIC and its reserves are not funded by public funds; member banks' insurance dues are the FDIC's primary source of funding

## Deposit insurance - important questions

- ▶ Who will fund the insurance?
- ▶ Limit of coverage - size and which accounts
- ▶ Potential for moral hazard

## Resolution regimes

## Resolution regimes

Resolution is the restructuring of a bank by a resolution authority through the use of resolution tools in order to safeguard public interests, including the continuity of the bank's critical functions, financial stability and minimal costs to taxpayers.

Source: <https://srb.europa.eu/en/content/what-bank-resolution>

## Effective resolution

- ▶ Financial difficulties in banks need to be resolved in an orderly, quick and efficient manner, avoiding undue disruption to the bank's activities and to the rest of the financial system
- ▶ In the past in the absence of effective resolution regimes, authorities have often had to put up taxpayers' money to restore trust and avoid a contagion effect of failing banks on the real economy
- ▶ While for most banks this can be achieved through the normal insolvency proceedings applicable to any company in the market, some banks are too systemically important and interconnected to allow for their liquidation through a normal insolvency process

Source: <https://srb.europa.eu/en/content/what-bank-resolution>

## Effective resolution

- ▶ Rather than relying on taxpayers to bail these banks out, a mechanism is needed to put an end to potential domino effects. It should allow public authorities to distribute losses to banks' shareholders and creditors – rather than on the taxpayers
- ▶ Resolution, also through its preventative effects, is essential to making banks safer and less likely to fail.
- ▶ In some cases, resolution rather than normal insolvency proceedings will be applied for banks when it is necessary, in the public interest, safeguards financial stability, and protects taxpayers.
- ▶ Such restructuring can provide for an orderly wind-down of the bank or restore the viability of all or part of the institution and is used only in cases where a bank cannot be resolved through normal insolvency proceedings without inflicting damage on the real economy and causing financial instability.

Resolution occurs at the point where the authorities determine that a bank is failing or likely to fail

- ▶ that there is no other supervisory or private sector intervention that can restore the institution to viability (for example by applying measures set out in a so-called recovery plan, which all banks are required to draft) within a short timeframe and
- ▶ that normal insolvency proceedings would cause financial instability while having an impact on the public interest

Source: <https://srbeuropa.eu/en/content/what-bank-resolution>

## Resolution regimes across borders - source: IMF, 2012

Idea: making resolution feasible without severe systemic disruption and without exposing taxpayers to loss

These features include a comprehensive “toolkit” of resolution powers for national authorities, including powers to:

- ▶ assume control of a financial institution from existing managers and owners
- ▶ effect a resolution of the troubled institution through the sale or merger of the entity, the transfer of assets and liabilities of the institution to third parties, or through unilateral debt restructuring or “bail-in”; and
- ▶ support the resolution through a temporary stay on the execution of early termination rights under financial contracts

## The Key Attributes of Effective Resolution Regimes for Financial Institutions

- ▶ international standard for resolution regimes
- ▶ part of the set of policy measures to address systemically important financial institutions that was endorsed by the G20 in November 2011
- ▶ address the problem of firms that are “too big to fail”
- ▶ make it possible to resolve any financial institution in an orderly manner without severe systemic disruption or exposing taxpayers to the risk of loss, by protecting the firm’s functions that are critical to the financial market or the real economy and ensuring that losses are borne by shareholders and creditors of the failing firm, as they would be in insolvency

<http://www.fsb.org/what-we-do/policy-development/effective-resolution-regimes-and-policies/>

## Key Attributes - Source: Financial Stability Board

- ▶ Set out the powers and tools that national resolution authorities should have at their disposal for firms in all financial sectors that could have a systemic impact if they fail
- ▶ Set out recovery and resolution planning requirements for all such firms and, in addition, require that Crisis Management Groups (CMGs) of home and key host authorities are set up to coordinate group-wide resolution strategies and plans for G-SIFIs. G-SIFIs are also subject to a regular high-level review of their resolvability through the FSB Resolvability Assessment Process

## For discussion: Who's responsibility is resolution

Popular view - Central banks are in the liquidity business, not in the solvency business. It should be the Minister of Finance to handle solvency issues - ultimately the Treasury will have to pay?

## Measuring systemic risk

## Measuring systemic risk

- ▶ Failure of financial institutions imposes costs on entire system
- ▶ These are called systematically important financial institutions (SIFIs)
- ▶ Results in regulators having to rescue the firms
- ▶ Anticipation of bailouts compromises market discipline
- ▶ Encourages excessive risk taking and leveraging
- ▶ This reinforces systemic risk on a system

## Measuring systemic risk

- ▶ Institutions that follow highly cyclical activities are prone to failure
- ▶ Interconnections among financial firms lead to risk
- ▶ It stems from networks in bilateral and multilateral relationships
- ▶ It also affects contracts and market behavior

## NYU Stern systemic risk rankings

Daily updated systemic risk rankings of U.S. financial institutions are provided by the New York University Stern School of Business Vlab:

- ▶ The core of these rankings: Analysis of MES
- ▶ MES: It is the short run expected equity loss if the whole market declines by 2%
- ▶ It takes into account the volatility of the firm and its correlation with market activity
- ▶ MES is used to produce a Systemic Risk Contribution, SRISK%
- ▶ Systemic risk is measured by the expected aggregate capital short-fall in the event of a crisis
- ▶ Firms are ranked by their percentage contribution to the capital short-fall

## AIFMRM systemic risk rankings

A ranking of South African financial institutions according to their contribution to systemic risk is provided by the University of Cape Town's AIFMRM

- ▶ These rankings are also based on (SRISK%)
- ▶ Produced using end of day market data
- ▶ The dataset used runs from 2000 to the end of 2006
- ▶ The source code for model used to compute the rankings is available to download from a github repository

## Systemic risk methodology

Systemic risk methodology:

1. Calculate the MES
2. Calculate the SRISK%

## Marginal Expected Shortfall

- 1 Dynamic bivariate relationship between the equity of an individual financial company and its broad index reflects market view of systemic risk
- 2 Expected loss by equity holders on a day when the entire markets falls by 2% as follows:

$$MES_{i,t} = E_{t-1}(-R_{i,t} | R_{m,t} < -0.02)$$

- 3 The conditional volatility of the firm is estimated using asymmetric GJR-GARCH
- 4 The correlation of the firm is estimated using asymmetric DCC

## Marginal Expected Shortfall

- 5 Taking into account the volatility and correlations forms the following equations:

$$MES_{i,t} = \sigma_{i,t} \times \rho_{i,m,t} \times E_{t-1}(-R_{m,t} | R_{m,t} < -0.02) + \text{tail corr.}$$

- ▶ Vlab calculates this for the largest 100 U.S financial firms every day starting in 1990 until present
- ▶ Allows comparison of actual losses of firms with predicted losses
- ▶ The average rank correlation over all 2% down days is 0.37 (0.44 during crisis) i.e. firms that are expected to lose the most in a market downturn generally do so

## Long Run Marginal Expected Shortfall

- ▶ The total loss of equity value of a firm in a longer-duration crisis can be approximated by multiplying the daily loss by a constant
- ▶ Objective is to estimate the equity loss over 6 months if the market's cumulative loss is greater 40%.

$$E_{t-1}\left(-\sum_{j=1}^{126} \exp(R_{i,t+j}) - 1 \middle| \sum_{j=1}^{126} R_{m,t+j} < -0.04\right) \approx \theta MES_i, t$$

- ▶ Can be estimated using Monte Carlo simulation of the bivariate stochastic process
- ▶ Using parameter estimates for Citibank over the sample period 1977 till 2009
  - ▶ The daily ES was 2.4%
  - ▶ The daily MES was 3.4%
  - ▶ The CrisisES was 38% and the CrisisMES was 53%
  - ▶ The ratio of the CrisisMES to the daily MES is 14.3 and  $\theta \approx 18$

- ▶ The contribution to systemic risk is measured by the capital shortage the firm would experience in a crisis
- ▶ Extent of capital shortage is the extent of the firm's contribution to systemic risk
- ▶ Calculated using current market capitalization and recent Compustat data on quasi-leverage
- ▶ This is defined as the ratio of book debt to market value of equity
- ▶ If equity declines to less than 8% of a firm's value, then it implies a firm is capital constrained and the capital short-fall is computed

- ▶ D: total book value of debt
- ▶ E: current market value of equity

$$\text{SurplusCapital} = E - 0.08(D + E) \quad (8)$$

- ▶ When the surplus is negative, it implies firms are in distress
- ▶ Size of distress is capital shortfall expected in a crisis

$$Distress_{i,t} = \min[0, 0.92(1 - CrisisMES) - 0.08D] \quad (9)$$

- ▶ The sum of capital shortfall for financial sector is aggregate capital shortfall
- ▶ A firms SRISK% is its percentage contribution to the aggregate capital shortfall

## 2007-2009 financial crisis

- ▶ Analysis of MES and SRISK% for four important periods:
  1. 1 July 2007: collapse of two highly leveraged Bear Stearns hedge funds as well as a market for asset based security issuance froze
  2. 1 March 2008: Collapse of Bear Stearns and sale to JPMorgan
  3. 12 September 2008: Lehman Brother's file for bankruptcy
  4. 31 March 2009: Stress testing of large banks in the US was introduced

	July 1, 2007			March 1, 2008			September 12, 2008			March 31, 2009		
	SRISK%	Rank	MES	SRISK%	Rank	MES	SRISK%	Rank	MES	SRISK%	Rank	MES
Citigroup	14.3	#1	3.27	12.9	#1	4.00	11.6	#1	6.17	8.8	#4	12.55
Merrill Lynch	13.5	#2	4.28	7.8	#3	5.36	5.7	#5	6.86	—	—	—
Morgan Stanley	11.8	#3	3.25	6.7	#6	3.98	5.2	#7	4.87	2.8	#7	9.16
JPMorgan Chase	9.8	#4	3.44	8.5	#2	4.30	8.6	#4	5.2	12.1	#2	10.55
Goldman Sachs	8.8	#5	3.6	5.3	#9	3.14	4.2	#9	3.58	3.7	#5	6.61
Freddie Mac	8.6	#6	2.35	5.9	#7	4.60	—	—	—	—	—	—
Lehman Brothers	7.2	#7	3.91	5.0	#10	4.88	4.6	#8	15.07	—	—	—
Fannie Mae	6.7	#8	2.47	7.1	#4	5.88	—	—	—	—	—	—
Bear Stearns	5.9	#9	4.4	2.9	#12	4.16	—	—	—	—	—	—
MetLife	3.6	#10	2.57	2.2	#15	2.93	1.9	#12	3.20	3.2	#6	11.93
Bank of America	0	#44	2.06	6.7	#5	3.60	9.6	#2	6.33	12.7	#1	13.41
AIG	0	#45	1.51	5.5	#8	4.63	9.6	#3	10.86	—	—	—
Wells Fargo	0	#48	2.38	1.9	#16	4.14	3.0	#10	5.40	10.4	#3	12.15
Wachovia	0	#51	2.2	4.6	#11	4.64	5.7	#6	9.61	—	—	—
Prudential Fin.	3.3	#11	3.09	2.6	#13	3.94	2.1	#11	4.17	2.6	#8	15.89
U.S. Bancorp	0	#40	1.62	0	#54	2.41	1.1	#15	5.20	2.6	#9	10.4
PNC Financial	0	#49	2.46	0	#43	2.84	0.3	#32	3.78	1.6	#10	10.03

Table 4.1 ranks the 10 most systemically risky financial firms among the 100 largest financial institutions for four dates ranging from July 1, 2007, through March 31, 2009. The Marginal Expected Shortfall (MES) measures how much the stock of a particular financial company will decline in a day, if the whole market declines by at least 2 percent. When equity values fall below prudential levels of 8 percent of assets, the Systemic Risk Contribution, SRISK%, measures the percentage of all capital shortfall that would be experienced by this firm in the event of a crisis. Note that the SRISK% calculations here incorporate existing capital shortfalls from failed institutions.

Source: [www.systemicriskranking.stern.nyu.edu](http://www.systemicriskranking.stern.nyu.edu).

Figure 5: MES and SRISK% for U.S. firms

## 2007-2009 financial crisis

- ▶ Figure 1 shows the MES and SRISK% calculations for the 10 most systemic financial institutions at each date
- ▶ The list covers 17 firms, 7 drop out due to failure
- ▶ July 2007: 5 firms capture 58.2% of the systemic risk
- ▶ March 2008: Systemic risk is more evenly spread as 43% is captured by 5 firms
- ▶ September 2008: Systemic risk becomes more concentrated and 5 firms capture 51.1%
- ▶ Looking at the Bank of America:
  1. July 2007: Was considered a relatively conservative institution; ranked 44th
  2. March 2008: Announce purchase of Countrywide financial; rank increases to fifth at 6.7%
  3. March 2009: Merged with Merrill Lynch; ranked as the most systemic institution with an SRISK% of 14.9%

## 2007-2009 financial crisis

- ▶ There are 3 firms that stand out when looking at September 2008 because they fail spectacularly
- ▶ Lehman brothers, AIG and Wachovia have MES values of 15.07%, 10.86% and 9.61%, respectively
- ▶ MES and SRISK have shown to be successful measure in identifying the firms most likely to face systemic risk
- ▶ This give regulators the ability to impose capital taxes on these firms to prevent detrimental undercapitalization

## African Bank collapse

- ▶ In August 2014 African Bank collapsed under a weight of bad debt
- ▶ August 6: African Bank announces an annual loss of R6.4bn
- ▶ August 7: Announcement that the company needs to raise R8.5bn in new capital
- ▶ African bank goes from not contributing to systemic risk at all to being ranked 10th at 3.12%
- ▶ Further equity losses increase the risk contribution to 3.52% and the ranking to 9th
- ▶ August 10: African bank is placed under curatorship, suspending the trading of both ordinary and preference shares, as well as debt instruments

## African Bank collapse

	August 6, 2014			August 7, 2014			August 8, 2014		
	Rank	SRISK%	MES	Rank	SRISK%	MES	Rank	SRISK%	MES
Standard Bank	1	22,77	0,01938	1	23,13	0,02099	1	22,83	0,02051
FirstRand	2	14,36	0,02515	2	13,63	0,0258	2	13,51	0,02534
Nedbank Group	3	12,71	0,02097	3	12,04	0,02163	3	11,84	0,02096
MMI Holdings	4	10,95	0,01349	6	10,14	0,01391	4	10,26	0,01373
Barclays Africa Group	5	10,35	0,01634	4	10,33	0,01736	5	10,19	0,017
Sanlam	6	10,20	0,01852	5	10,29	0,02079	6	10,17	0,0201
Liberty Holdings	7	9,31	0,00969	7	8,46	0,00939	7	8,58	0,0093
Old Mutual plc	8	3,74	0,01513	8	3,43	0,01519	8	3,56	0,01602
Coronation Fund Managers	9	3,51	0,01184	9	3,24	0,01288	10	3,34	0,01527
Investec Ltd.	10	0,82	0,02208	11	0,91	0,02679	11	0,90	0,0261
Investec plc	11	0,69	0,01869	12	0,75	0,02201	12	0,74	0,02153
PSG Konsult	12	0,29	0,01	13	0,24	0,00698	13	0,24	0,00705
JSE	13	0,24	0,00606	14	0,23	0,00637	14	0,23	0,00622
African Bank Investments	59	0	0,01919	10	3,12	0,15836	9	3,54	0,25451

Figure 6: MES and SRISK% for S.A. firms

## African Bank collapse

- ▶ African Bank collapse cost close to R10bn in total
- ▶ South African financial markets exhibit high levels of risk concentration
- ▶ Only three firms contribute close to 50% of aggregate risk
- ▶ Highly interconnected institutions and little competition contribute towards maintaining the status quo
- ▶ There is high risk of contagion in the event of a single failure

## Using AIFMRM's systemic risk model

- ▶ The source code has been made available on this github repository
- ▶ An interactive chart and a summary of the results are available on <http://systemicrisk.org.za>

## Using AIFMRM's systemic risk model

- 1 To use the model, clone the repo and update the input data
  - ▶ Instructions on how to clone a repo are available [here](#)
  - ▶ Alternatively, download the repo as a zip file
  - ▶ The MES\_Data.xlsx spreadsheet contains the dataset
  - ▶ To automatically update it, open the file in excel with a working Bloomberg terminal plug-in
  - ▶ It is possible to use alternative sources of data, however the format in MES\_Data.xlsx must be strictly adhered to.

# Using AIFMRM's systemic risk model

## 2 Update ranges and file directories

- ▶ The script main.m requires additional functions to run, these can be found in the 'MFE' and 'SysRiskMeasures' folders
- ▶ To add these folders to Matlab's path, update the paths under the Add functions to path (line 64) section and point the directories to the location where the folders have been saved.

```
64 %% Add functions to path:  
65 %      Point directory to location of extracted files  
66  
67 addpath(genpath('E:\SysRiskMeasures'))  
68 addpath(genpath('E:\MFE'))  
69 addpath(genpath('E:\cell2csv'))
```

## Using AIFMRM's systemic risk model

- ▶ The ranges of the data being imported into Matlab have to be adjusted every time the dataset is updated

```
74 %% Reading in data:  
75  
76 data.Price = xlsread('MES_data.xlsx','Share prices','C5:R4246');  
77 data.Index = xlsread('MES_data.xlsx','Index','C3:C4244');  
78 data.Liabilities = xlsread('MES_data.xlsx','Liabilities','D3:S4244');  
79 data.MarkCap = xlsread('MES_data.xlsx','Market Cap','C3:R4330');  
80 data.Equity = xlsread('MES_data.xlsx','Equity','C3:R4244');  
81 [~,~,Series] = xlsread('MES_data.xlsx','Share prices','C3:R4'); % Cell containing tickers and names  
82 [~, ~, raw_dates, dates] = xlsread('MES_data.xlsx','Share prices','B5:B4246','','@convertSpreadsheetExcelDates');  
83 dates = dates(:,1);  
84 dates = datetime([dates(:,1)].', 'ConvertFrom', 'Excel');  
85 n = length(Series);
```

## Using AIFMRM's systemic risk model

### 3 Model parameters

- ▶ The model parameters can be adjusted by making changes to the section shown below. The respective parameters are described in the script documentation

```
100  M = 1;  
101  L = 0;  
102  N = 1;  
103  P = 1;  
104  O = 1;  
105  Q = 1;  
106  GJRTYPE = 2;  
107  
108  alpha= 0.05;  
109  k = 0.08;
```

# Using AIFMRM's systemic risk model

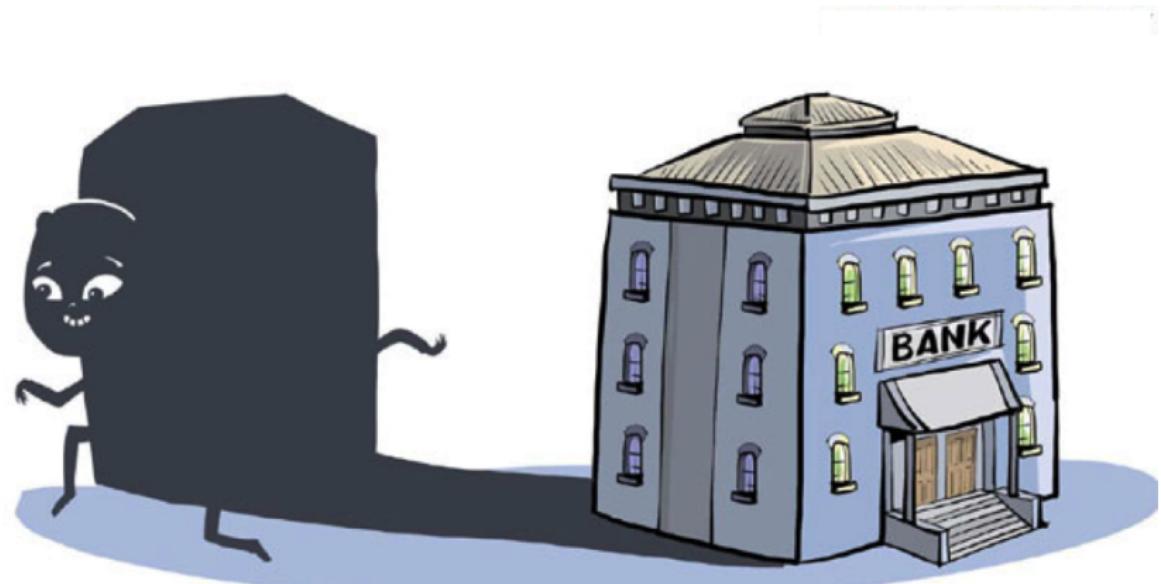
## 4 Output

- ▶ This script will output all data into the 'OUT' folder located in the current working directory.
- ▶ Output will include a csv file for each institution which will contain time series' of the MES, SRISK, SRISK contribution and SRISK ranking.
- ▶ Institutions with no contribution to systemic risk on a given day assigned a rank of 0.

## Introduction to shadow banking

## What is shadow banking?

Private intermediation outside of the regular banking system

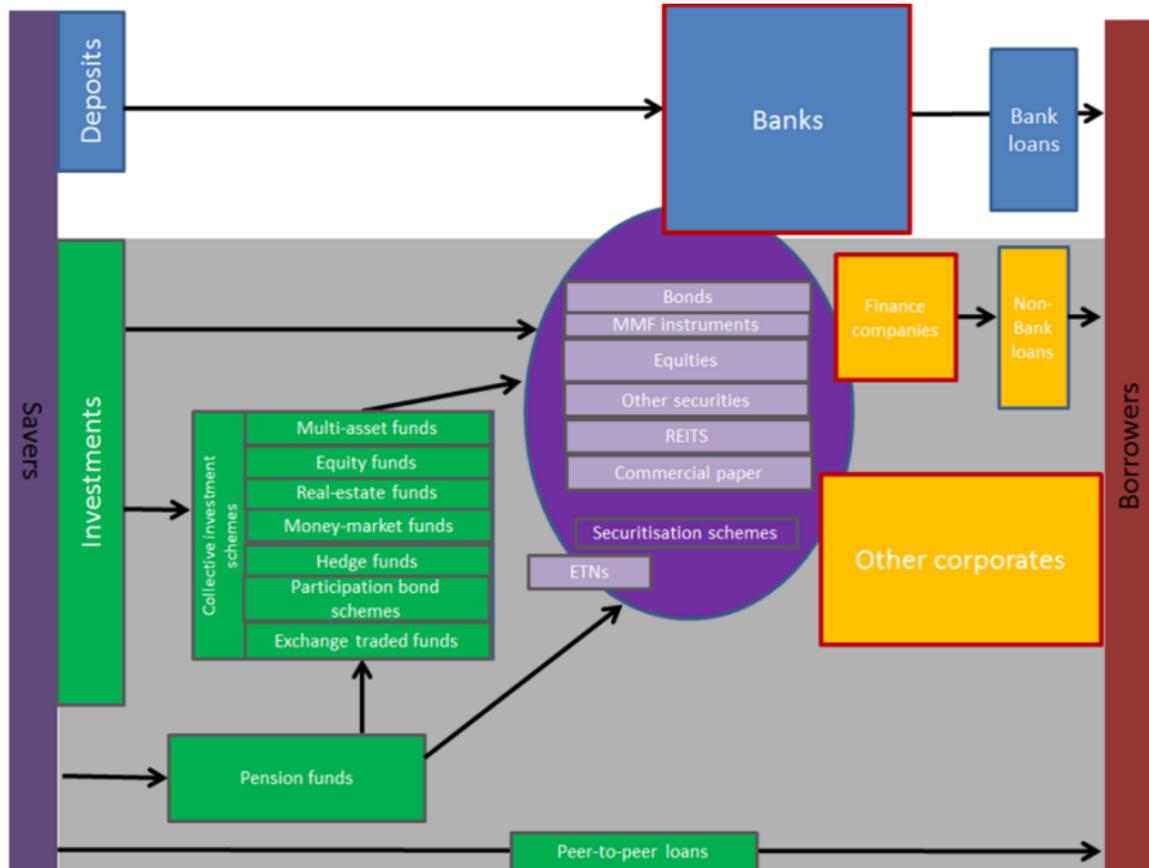


## Definition: Financial Stability Board

Shadow banking system can be broadly defined as the system of credit intermediation that involves entities and activities (fully or partly) outside the regular banking system.

Source: FSB Report "Shadow Banking: Strengthening Oversight and Regulation" (27 Oct. 2011)

# What does outside the banking sector look like?



## Shadow banking - history

- ▶ *Shadow banking* coined in 2007
- ▶ Prior to 2007 - known as market-based finance or non-banks
- ▶ A lot of focus on developments in the US
- ▶ US Money-market mutual funds: 1970
- ▶ US Cash management accounts: 1977
- ▶ Less-regulated market for capital grew rapidly next to the traditional banking system
- ▶ Regulatory arbitrage → Deregulation

## The role of the FSB

In response to the G-20 Leaders' request at the Seoul Summit in Nov. 2010, the FSB has been working on the following three aspects:

- ▶ Define the scope
- ▶ Establish a system-wide monitoring framework to assess global trends and risks
- ▶ Develop policy recommendations to address financial stability risks from shadow banking

## Why worry about shadow banking?

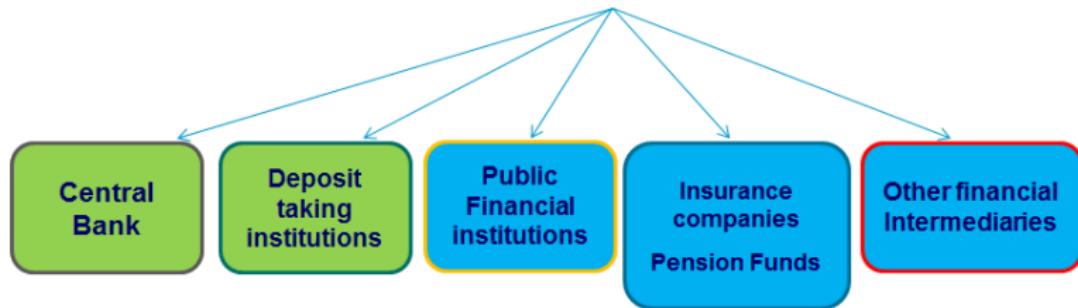
- ▶ Systemic risk
- ▶ Regulatory arbitrage
- ▶ Monetary policy transmission
- ▶ Channel for capital flows
- ▶ Financial inclusion

## FSB measurement of shadow banking and global shadow banking trends

## 2 step Approach

1. Cast the net as wide as possible
2. Narrow down

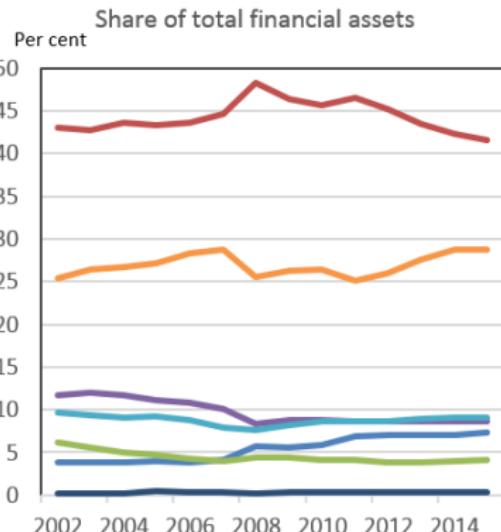
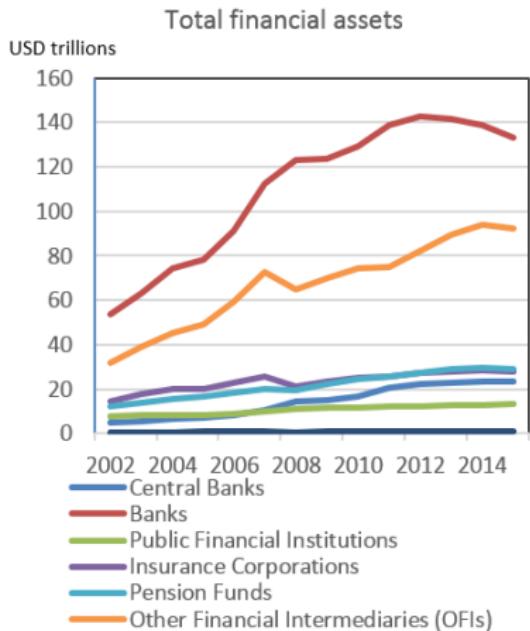
## Step 1



## Step 2 - Narrowing down per Economic Funcion (EF)

Economic Function	Definition	Key shadow banking risks	Typical entity types*
EF1	Management of collective investment vehicles with features that make them <b>susceptible to runs</b>	Public funds: Liquidity and maturity transformation Private funds: Leverage and maturity transformation	Fixed income funds, mixed funds, credit hedge funds, real-estate funds
EF2	Loan provision that is <b>dependent on short-term funding</b>	Liquidity and maturity transformation, leverage	Finance companies, leasing companies, factoring companies, consumer credit companies
EF3	Intermediation of market activities that is <b>dependent on short-term funding</b> or on secured funding of client assets	Liquidity and maturity transformation, leverage	Broker-dealers
EF4	Facilitation of credit creation	Credit risk transfer	Credit insurance companies, financial guarantors, monolines
EF5	Securitisation-based credit intermediation and funding of financial entities	Liquidity and maturity transformation, leverage	Securitisation vehicles

# Distribution of financial assets globally

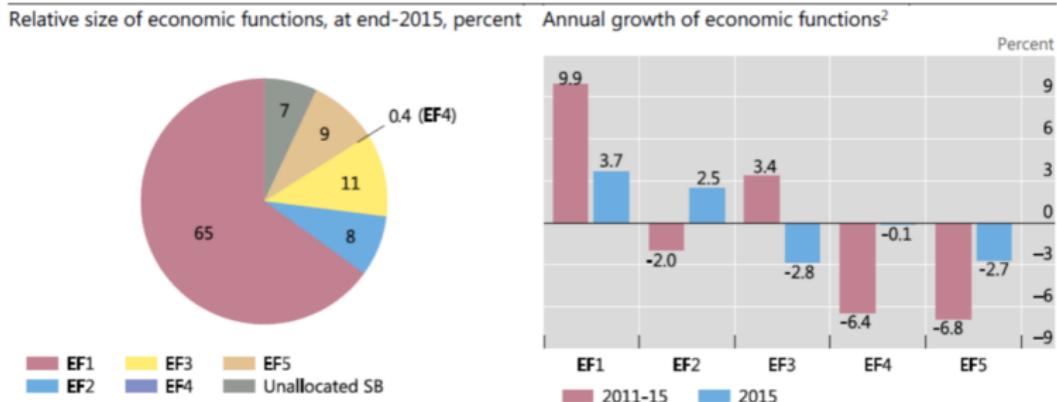


## Step 2 - Narrowing down (27 Jurisdictions)

Classification by economic function<sup>1</sup>

27 jurisdictions

Exhibit 5-2



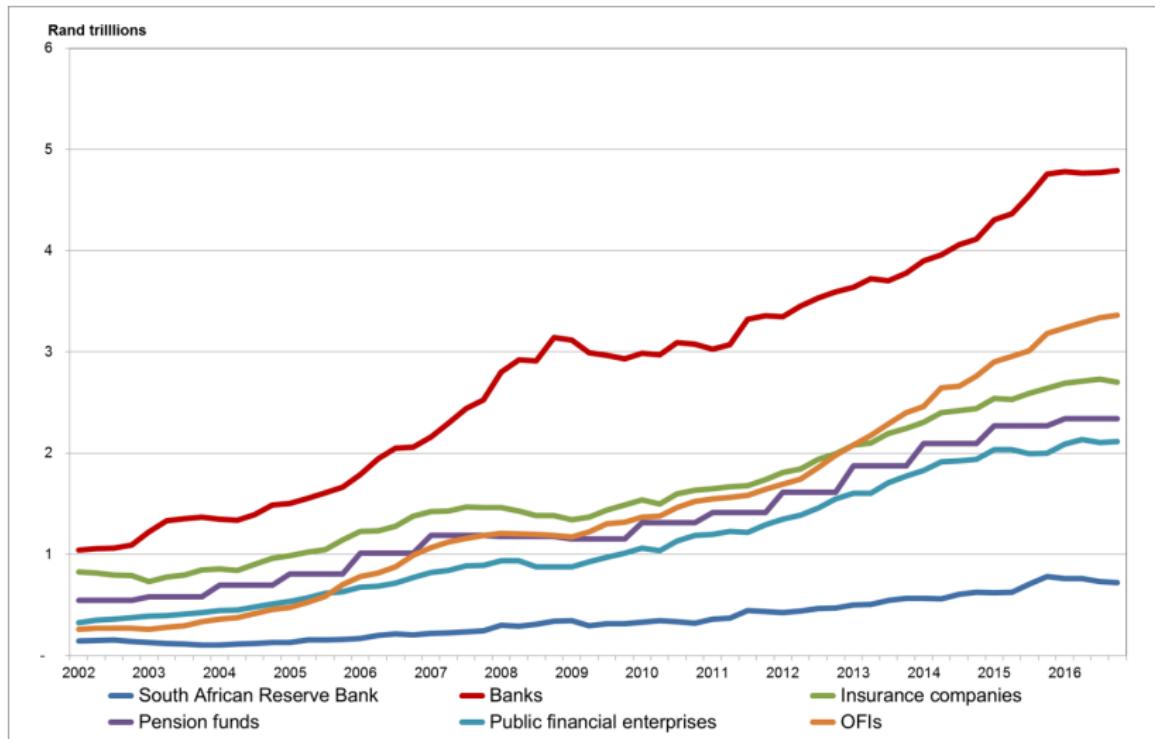
EF1 = Economic function 1; EF2 = Economic function 2; EF3 = Economic function 3; EF4 = Economic function 4; EF5 = Economic function 5;  
Unallocated SB = assets of entities that were assessed to be involved in shadow banking activities, but which could not be assigned to a specific economic function.

<sup>1</sup> Net of entities prudentially consolidated into banking groups. <sup>2</sup> Exchange rate effects have been netted out by using a constant exchange rate (from 2015). Calculated based on historical data included in jurisdictions' 2016 submissions.

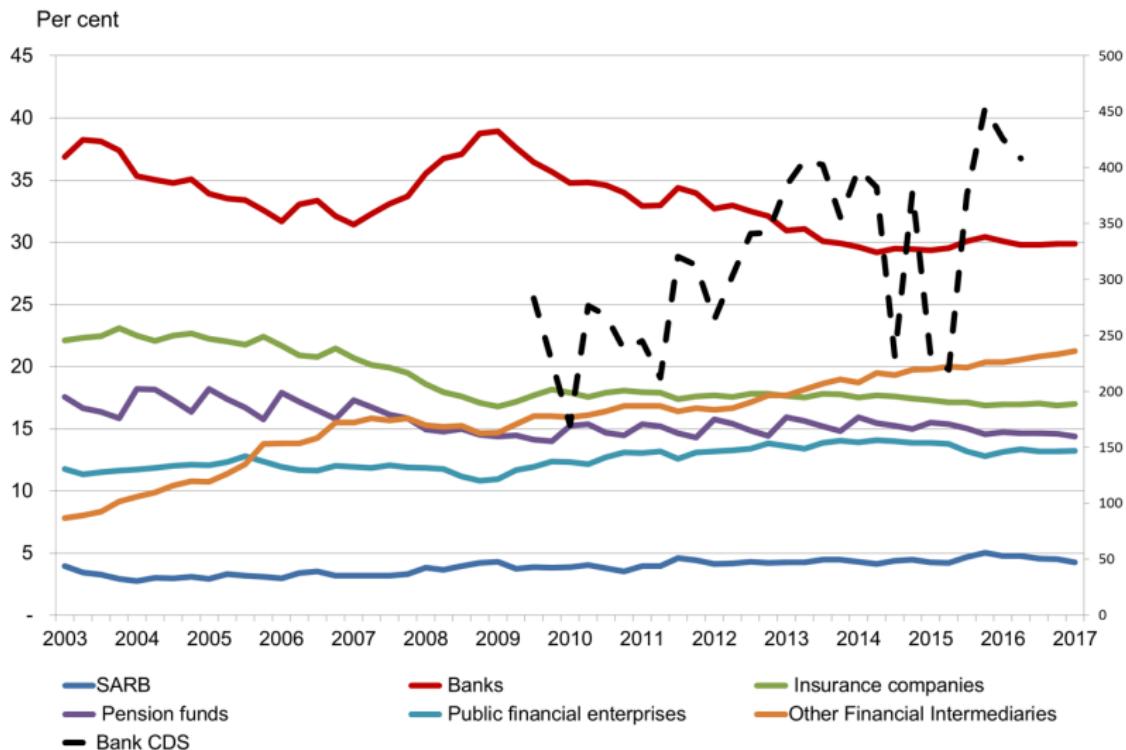
Sources: National sector balance sheet and other data: FSB calculations.

Source: <http://www.fsb.org/wp-content/uploads/global-shadow-banking-monitoring-report-2016.pdf>

## Distribution of financial assets among FIs in South Africa (Rand value)



## Distribution of financial assets among FIs in South Africa (per cent)



## Money Market Funds

## Overview

- ▶ Money market funds (MMF): financial intermediary that manages funds on behalf of investors who wish to invest in low-risk securities while withdrawing funds at short notice
- ▶ Primary objective: maintain the value of the principal of its assets
- ▶ Low risk, short term securities such as commercial paper, certificates of deposits and treasuries
- ▶ Benefit relative to bank deposits is that MMFs earn a higher yield

## Primer on money market funds

- ▶ MMFs emerged in the 1970's as an alternative to bank deposits
- ▶ Driving force: restrictive regulation of bank deposits, limited returns to investors
- ▶ Allowed investors to circumvent this regulation by directly investing in MMF investments
- ▶ Government lifted the interest rate ceiling but rates on bank deposits were still lower than MMF rates, which can be seen in the figure

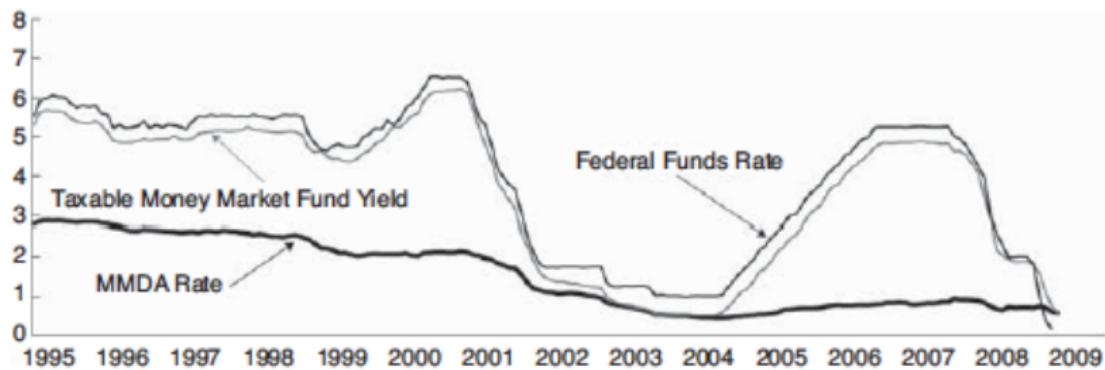
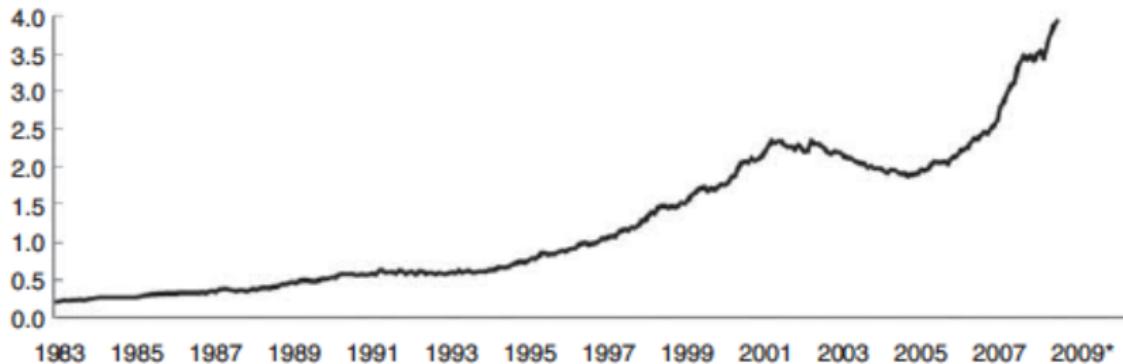


Figure 7: Comparison of Annual Bank Rates and Money Market Fund Yields (Percent, Monthly)

- ▶ Interest rates on MMF deposits followed the federal funds rate but bank deposit rates were below the federal funds rate
- ▶ As a result, MMFs offer a yield advantage over bank deposits
- ▶ Total money market deposits increased steadily over the past 3 decades from 800 billion dollars in 1987 to 3 trillion dollars in 2007 as in the following figure



\*Data are through January.

**Figure 8:** Total Net Assets of Money Market Funds (Trillions of Dollars, Monthly)

- ▶ Explanation for the difference: money market deposits are riskier since there is no government insurance
- ▶ Hence, even though MMFs seek to preserve the value of an investment at 1 dollar per share, investors can suffer a loss on their investment
- ▶ To limit this risk, government regulates holdings of MMFs under certain rules
- ▶ It specifies the type of instruments they can invest in
- ▶ They cannot hold more than 5% of their assets in securities of higher rating of any individual issuer
- ▶ They cannot hold more than 1% of their assets in securities of any individual issuer
- ▶ Here, model data is used to analyze holdings of MMFs
- ▶ Focused on taxable MMFs which represent 84.5% of MMF holdings in 2007
- ▶ There were 473 taxable MMFs holding assets worth 1.95 trillion

- ▶ One third of the funds were treasury funds i.e. government debt and government-backed agency debt
- ▶ The remaining two thirds were prime funds that invest in non-government assets such as commercial paper
- ▶ Largest asset class held by taxable MMFs were commercial paper which accounted for 634 billion dollars (32.5% of total asset holdings)
- ▶ Remaining class includes: (in dollars)
  1. Government debt (585 billion)
  2. Repurchase agreement (390 billion)
  3. Bank obligation (297 billion)
  4. Other assets (45 billion)

- ▶ Study conducted by Moody's shows that in January 2007, the largest institutional prime funds accounted for a total of 459 billion dollars of assets
- ▶ MMFs are highly exposed to risks in the financial industries as was seen

## MMFs during the crisis

- ▶ After the bankruptcy of Lehman Brother's in September 2008, investors learnt that the Reserve Primary Fund (RPF) owned more than 785 million of Lehman Brother's commercial paper
- ▶ This triggered an immediate run on the fund
- ▶ It was forced to pay out 10.8 billion dollars in redemptions
- ▶ Total of 28 billion of further withdrawals was requested
- ▶ The run spread to other MMFs that invested in commercial paper
- ▶ Within a week, investors reduced their investments by more than 172 billion
- ▶ To stop the run, US department of Treasury instituted a temporary deposit insurance covering all money market investments

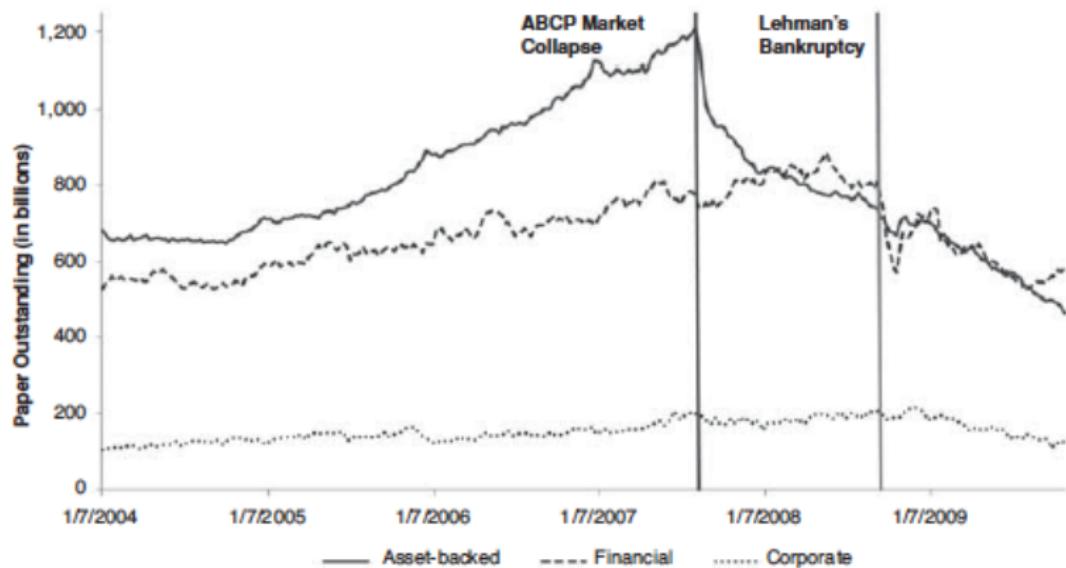
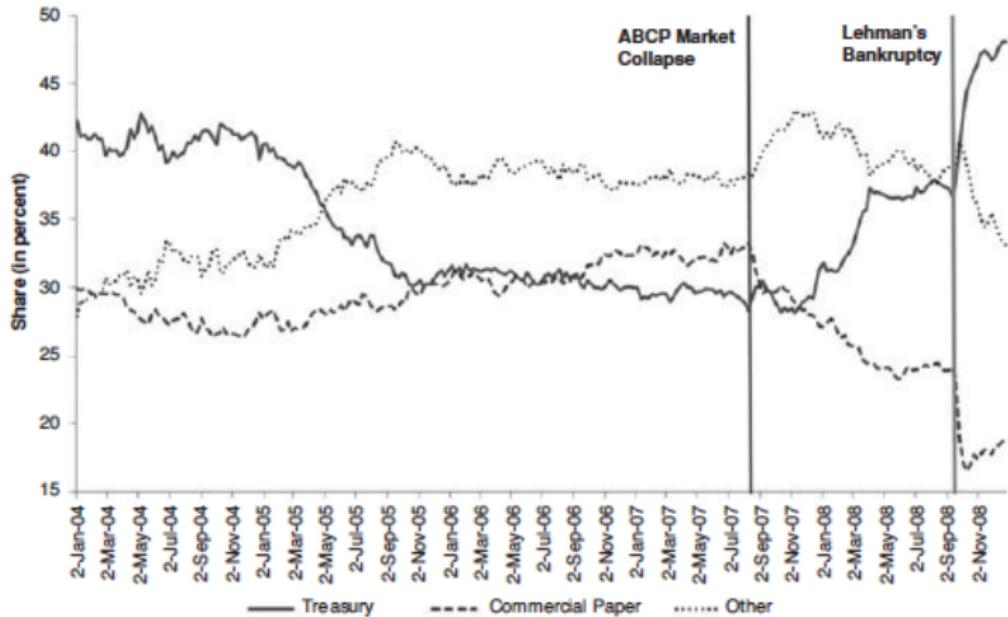


Figure 9: Commercial Paper Outstanding, January 2004 to October 2009

- ▶ As seen in the figure, financial commercial paper declined by 29.5% from 806 billion dollars to 568 billion from September 2008 to October 2008, respectively
- ▶ Asset-backed commercial paper declined by 9.8% from 741 billion to 668 billion
- ▶ Also, the spreads on both asset-backed and financial commercial paper significantly increased
- ▶ MMFs were the leading force in the decline of the commercial paper market
- ▶ Even though MMFs had deposit insurance they decided to decrease holdings in commercial paper, as can be seen in the following figure



**Figure 10:** Money Market Funds Asset Shares in Total Holdings, January 2004 to December 2008

- ▶ It shows that within one month of Lehman Brother's bankruptcy, commercial paper holdings decline from 24.2% to 16.9%
- ▶ This was accompanied by MMFs expanding their holdings of government debt
- ▶ The decline in commercial paper holdings was accompanied by MMFs expansion of their holdings of government debt from 36.7% to 44.5% of asset holdings

## Government response to Lehman Brothers bankruptcy

- ▶ In response to MMFs risk, government decided to introduce new policy initiatives to contain it
- ▶ September 2008: Treasury announced that the US would temporarily guarantee assets of MMFs
- ▶ At the same time, it announced a new lending program - asset backed commercial paper money market mutual fund liquidity facility (AMLF)
- ▶ AMLF provides loans to commercial banks so they could purchase high-quality asset backed commercial paper from MMFs
- ▶ These are non-recourse loans which imply if the asset-backed commercial paper defaults, the Federal reserve takes over the commercial paper as can be seen in the following figure

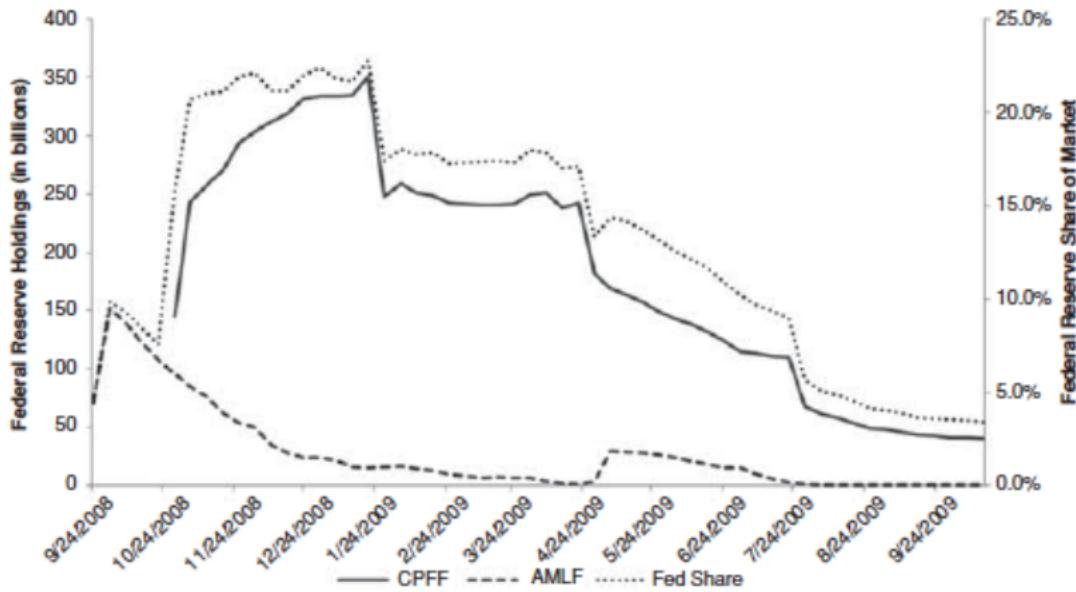


Figure 11: Holdings of Fed Funding Facilities, September 2008 to October 2009

- ▶ AMLF started buying commercial paper in 2008 and in two weeks announced 150 billion dollars worth of purchases
- ▶ Over time AMLF decreased its purchases and by 2009 and holdings were almost zero
- ▶ Oct. 2008: Federal Reserve announced in addition to buying 3 month commercial paper directly from eligible issuers they will buy from the Commercial Paper Funding Facility (CPFF)
- ▶ Only US issuers of commercial paper were eligible to sell commercial paper to this facility
- ▶ Interest rate on corporate financial commercial paper was the 3 month overnight indexed swap rate and 200 basis points
- ▶ As was seen in the previous figure, the CPFF started purchasing commercial paper in October 2008

- ▶ Spreads on all types of commercial paper significantly decreased
- ▶ By the end of 2008: total value of commercial paper was 335 billion dollars
- ▶ It expanded to include shorter-maturity assets and the value of assets purchased reached 40 billion in 2009
- ▶ Main difference between the MMF and money market investor facility is that the money market investor facility is restricted to money market instruments other than asset-backed commercial paper

## New regulation and assessments

- ▶ SEC adopted new regulation for MMFs
- ▶ This new regulation aims at decreasing risk-taking behavior by them
- ▶ It does so by restricting their investments to the highest-quality securities
- ▶ This reduces the average maturity of their holdings by requiring funds to maintain a portion of their portfolio instruments that can be converted into cash
- ▶ When evaluating the SEC regulation, MMFs perform two main functions:
  1. They effectively form part of the payment system - MMF investors can redeem their shares on demand
  2. MMFs primarily invest in short term financial securities issued by the financial sector

- ▶ Key provisions of the new MMF regulation are as follows:
  1. Improved portfolio liquidity (30% of MMF holdings must be liquid within one week)
  2. Higher credit quality (maximum of 3% invested in second-tier securities)
  3. Shorter portfolio maturity (maximum weighted average maturity of a fund's portfolio restricted to 60 days)
  4. Introduction of periodic stress tests to evaluate funds' ability to withstand shocks
  5. Enhanced disclosure (monthly reporting of money market fund holdings)
  6. Authorization of a fund's board of directors to suspend redemptions if the fund breaks the buck

- ▶ Importantly, the SEC decides against the introduction of a floating asset value and instead maintained the stable net asset value
- ▶ Key observation: new regulation doesn't address the issue that government guarantees aren't likely in future financial crises
- ▶ Hence, there are alternative approaches such as the Glass-Steagall approach, discount window for MMFs and requiring floating net asset values as can be seen in the following table

New SEC Regulation	Option 1: Glass-Steagall	Option 2: Discount Window	Option 3: Floating Net Asset Value
Minimum liquidity, maximum maturity	Recognize government support during systemic crisis	No guarantee during systemic crisis	No guarantee during systemic crisis
Restrict to first-tier securities	Charge insurance fee	Allow funds to suspend redemptions (SEC)	Require floating net asset value
Periodic stress tests	Restrict liquidity and maturity (SEC)	Lend against illiquid securities	
Monthly disclosure	Limit exposure to single issuer		
Authorize fund to suspend redemptions			

Figure 12: Money market proposals

## Money market proposals

Glass-Steagall for MMFs:

- ▶ Based on the principle that MMFs look like banks and are engaged in maturity mismatch
- ▶ Government supports MMFs during a systemic crisis
- ▶ Precision of guarantees should be restricted to the largest systemic crisis and can be at the discretion of the financial regulator
- ▶ In exchange, government charges a fee to MMFs
- ▶ Recommended is restrictions on exposure to a single issuer by aggregating exposure across securities

## Discount window for MMFs:

- ▶ Based on the idea that MMFs can be treated differently from banks, that is, without explicit guarantees to deposits
- ▶ Government would announce that it will not provide guarantees to MMFs during a systemic crisis
- ▶ To make an announcement credible, government needs to outline a procedure for stopping runs on MMFs
- ▶ Primary purpose is to allow for an orderly liquidation of the fund
- ▶ This measure recognizes that putting a stay on a single funds redemptions can trigger a run on the rest of the MMF sectors
- ▶ Also, government need to establish a liquidity window which leads to MMFs freely being against liquid collateral
- ▶ On illiquid assets, either a central bank would lend through the liquidity window against a fee
- ▶ Or the illiquid assets should be liquidated in an orderly manner
- ▶ In addition, regulators require MMFs to purchase guarantees from affiliated financial intermediaries

Require floating net asset value approach:

- ▶ Require MMFs to use a floating net asset value
- ▶ This however, would effectively outlaw MMFs
- ▶ Expect MMFs to have a float net asset value but still provide a stable net asset value
- ▶ In a crisis, this would be equivalent to MMFs due to the cost associated with it

## The repurchase agreement (Repo) market

## Overview

- ▶ The shadow banking system is a system of financial institutions that mostly look like a bank, borrow short term in rollover debt markets, leverage themselves significantly and lend and invest in longer-term and illiquid assets but are less regulated
- ▶ Most important component is securitized debt: US treasuries, agencies, corporate bonds, commercial paper, mortgage-backed securities and equities
- ▶ By 2009, the amount of outstanding securitized debt in the US was 11.6 trillion dollars
- ▶ This securitized debt is in the form of repurchase agreements
- ▶ Which is a short term transaction between two parties in which one party borrows cash from the other by pledging a financial security as collateral

- ▶ The repo market totaled about 2 trillion dollars as of 2009
- ▶ Based on average daily amount outstanding, the Federal Reserve Bank of New York put the primary dealers repo financing at 6.5 trillion dollars in 2008
- ▶ This then decreased to 4.4 trillion dollars in 2009
- ▶ There was no mention of this in the Dodd-Frank Act

## Primer on US repo market

- ▶ Primary security deals enter into a sale and repurchase agreement
- ▶ The day the repo is initiated is called the sale date
- ▶ The day the repo is terminated is called the purchase date
- ▶ Since the repo is a secure loan and the interest on the loan is small, the counterparty risk can be issued on collateral
- ▶ Loans are mostly extended overnight i.e. one-day transaction
- ▶ Participants in the repo market include commercial banks, investment banks, hedge funds, mutual funds, pension funds, MMFs as well as Federal Reserve and primary security dealers
- ▶ Term repos have terms longer than one day but shorter than one year
- ▶ The federal reserve participates in the repo market to implement monetary policy
- ▶ Primary security dealers participate to finance their market working and risk management activities

- ▶ Owners of large amounts of idle cash engage in the repo market as follows:
  1. To get better interest rates as compared to deposits at commercial banks
  2. Insurance purposes: large deposits at commercial banks aren't insured

## Evaluation of the repo market

- ▶ Repos were introduced to the US financial market by the Federal Reserve in 1917
- ▶ It allows the Fed to extend credit to its member banks
- ▶ The Federal Reserve used repos secured with banker's acceptances to extend credit to dealers which encourages development of a liquid secondary market for acceptance
- ▶ Early repos had two distinguished features:
  1. Accrued interest was excluded from the price of the repo securities
  2. Even though the creditor could sell or deliver, the repo securities rested with the debtor

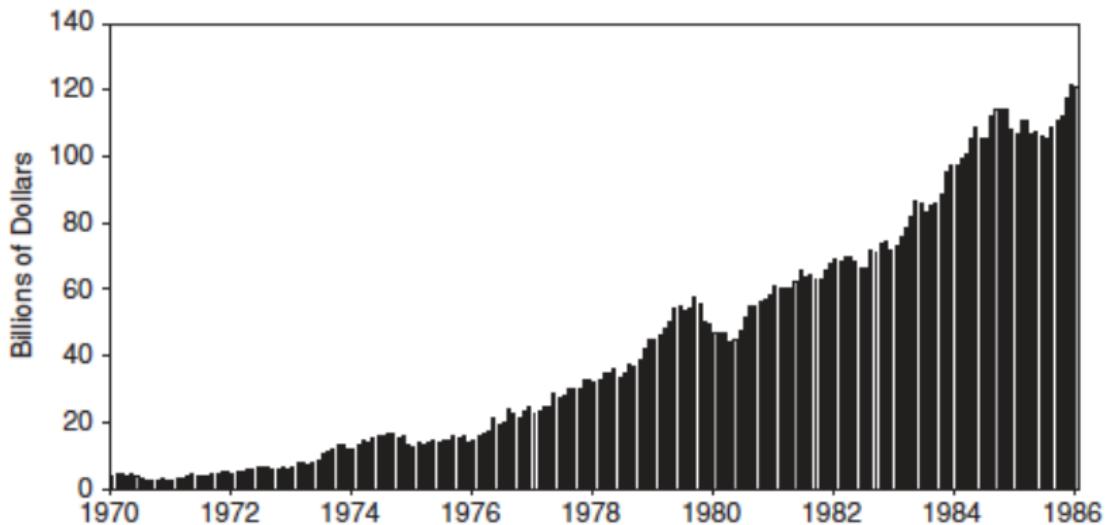


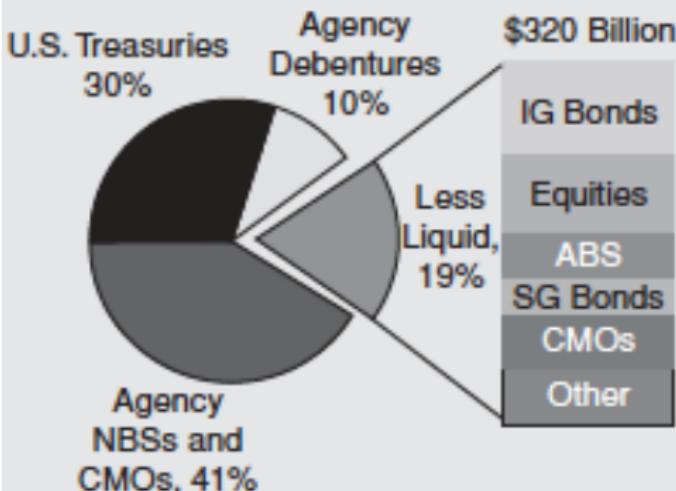
Figure 13: Monthly Averages of Daily Outstanding Overnight and Term Repos, 1970 to 1986

- ▶ As can be seen from the graph, it shows the size of the market from January 1970 to January 1986, as reported by the Federal Reserve Board
- ▶ This is due to the parallel growth in government securities dealers' positions and financing, and the repo market grew by leaps and bounds
- ▶ This had the following implications:
  1. Repo securities were underpriced
  2. Creditors had to give the debtor any coupon payments on the repo securities
  3. Bankruptcy: creditor cannot take ownership or be able to sell immediately

- ▶ Change to the repo contracts were brought about after the collapse of Drysdale Government securities Inc in 1982
- ▶ Despite its limited equity, Drysdale has been acquiring substantial amounts of debt securities through reverse repos and at prices that exclude accrued interest
- ▶ Dealer delivery failures in the 1980's gave rise to the emergence of tri-party repos (a third party representative to manage collateral)
- ▶ Today, there are only two tri-party agents in the United States, called the tri-party clearing banks: Bank of New York Mellon and JPMorgan Chase
- ▶ The Fed's decision to extend its lender-of-last-resort support through the Primary Dealer Credit Facility(PDCF) to the systemically important primary dealers during the recent financial crisis a result of the two tri-party agents

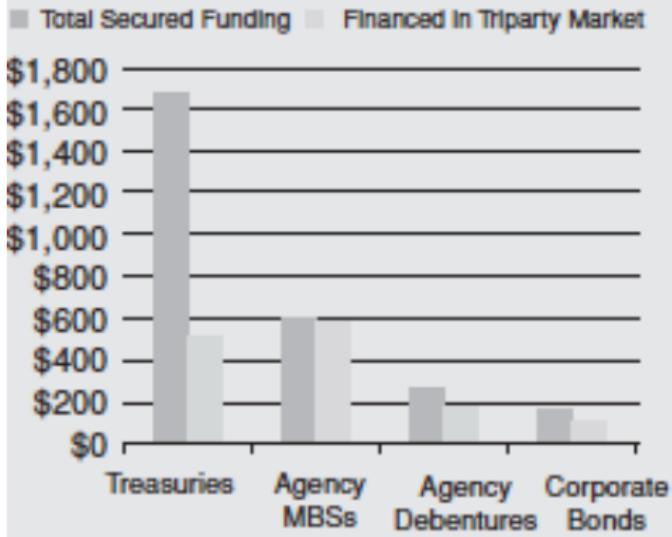
## Part A

**Triparty Repo Market's Size Is \$1.7 Trillion**  
The Collateral Is Mostly Liquid and  
High-Quality



For both exhibits, triparty data is shown as of April 7, 2010. For Part B, total secured funding is as of April 9, 2010.

**A Major Funding Source for Primary Dealer  
PDs get –50 Percent of Secured Funding \*through Triparty Repo**



- ▶ Looking at the two figures, tri-party repos were nearly 40% lower than its peak size in 2008, at 1.7 trillion dollars
- ▶ The collateral in this market mostly consists of Treasuries
- ▶ At 320 billion dollars, less liquid collateral is still a large portion, although this has decreased by 65% since the start of the financial crisis
- ▶ Repo market evolution:
  1. 1917: Federal Reserve introduces repos, accrued interest is excluded from the invoice price of repo securities, and repo securities are subject to automatic stay
  2. 1929: Use of repos declines with the onset of the Great Depression
  3. 1951: Congress enacts the Treasury into bringing repos back into favor

- ▶ Repo market evolution continued:
  1. 1982: Accrued interest is included in the invoice prices of repo securities
  2. 1984: Congress enacts the Bankruptcy Amendments and Federal Judgeship Act of 1984 to exempt repos on Treasury and federal agency securities
  3. 2005: Congress enacts the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 to expand the definition of repos to include mortgage loans, mortgage-related securities, and interest from mortgage loans and mortgage securities, all mortgage-related repo securities become exempt from the application of automatic stay

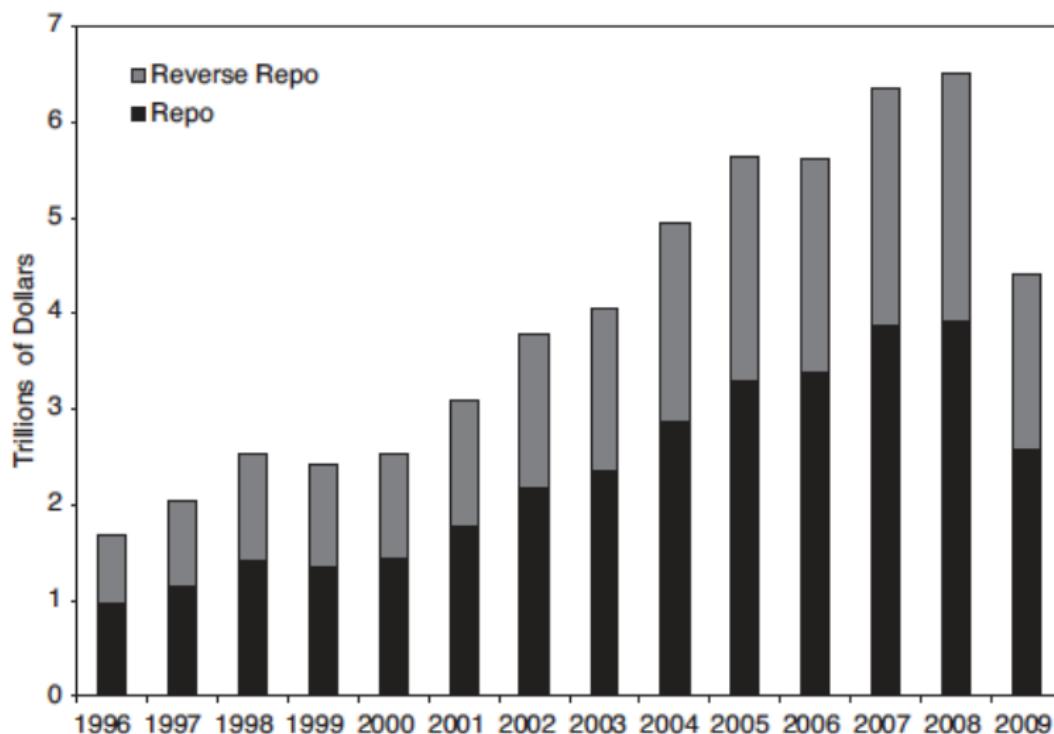


Figure 14: Annual Averages of Daily Financing by U.S. Government Securities Primary Dealers

- ▶ The previous figure depicts the evolution of financing by primary dealers in the US government securities market from 1996 through 2009 and offers a feel for the exponential growth of the repo market since the mid-1990s
- ▶ The next three figures and one table show the FRBNY Task Force on Tri-Party Infrastructure White Paper (2010) which shows the growth of the tri-party repo market from May 2002 through May 2010, the exponential growth of the US debt market over the same period and the composition and concentration of tri-party repo collaterals, respectively

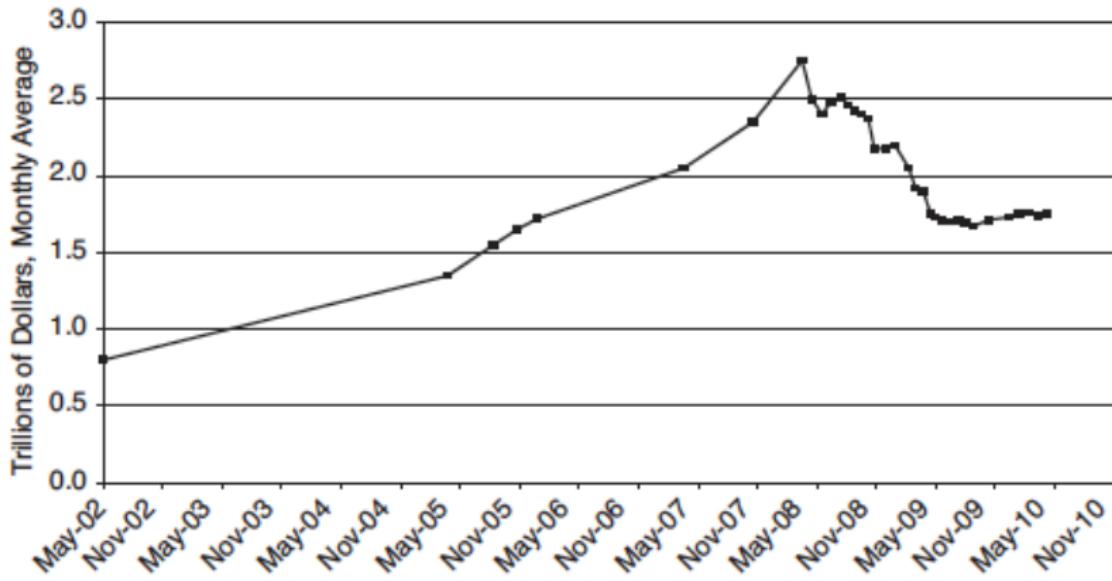


Figure 15: Growth of Tri-Party Repo Market

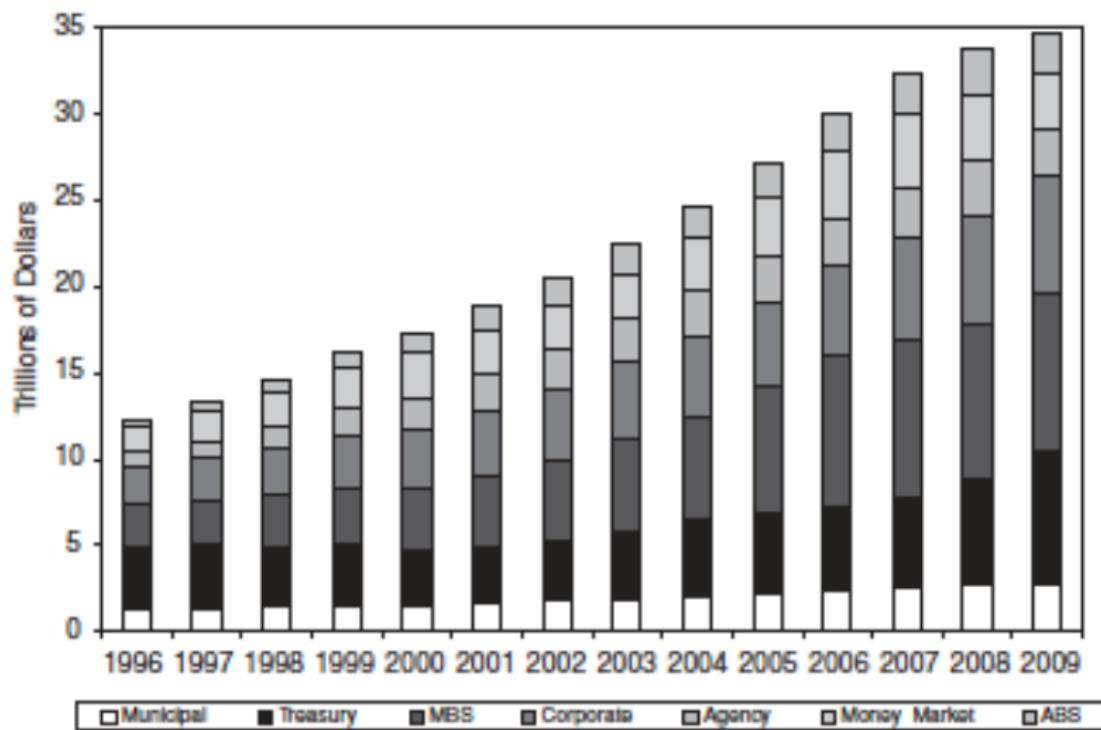


Figure 16: Size of the US Debt Market, 1996 to 2009

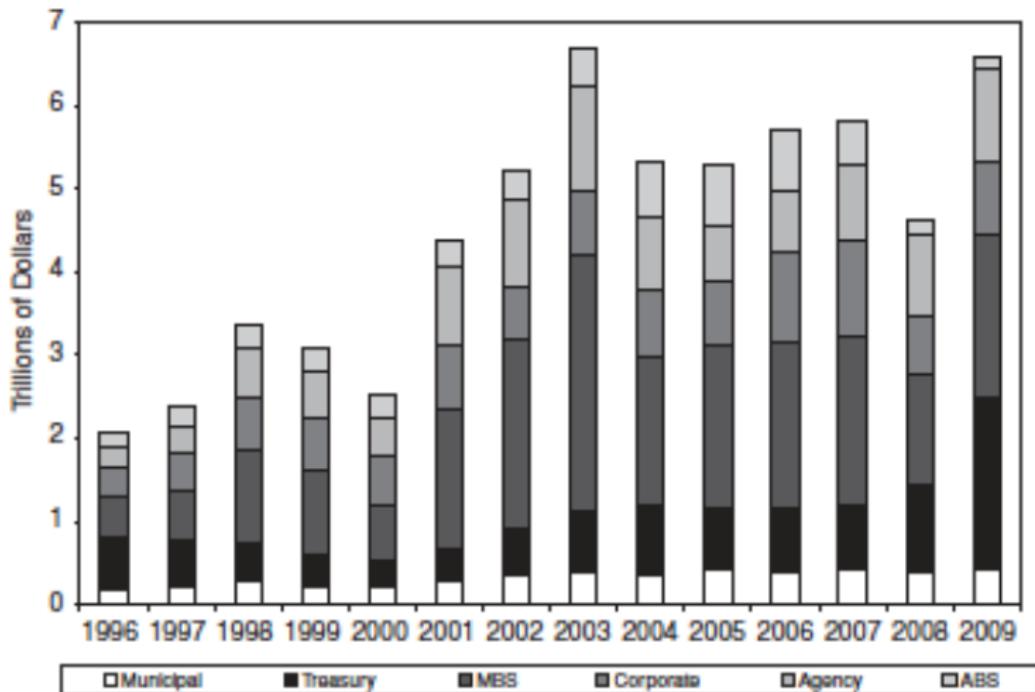


Figure 17: Issuances in the US Debt Market, 1996 to 2009

**Composition and Concentration of Tri-Party Repo Collateral**

Asset Group	Collateral Value (\$ Billions)	Share of Total	Concentration by Top Three Dealers
ABS (Investment and Non-Investment Grade)	\$ 41.7	2.4%	45%
Agency CMOs	112.7	6.6	46
Agency Debentures (Including STRIPS)	179.5	10.5	33
Agency MBSs	584.9	9.3	45
CMOs Private-Label (Investment Grade)	25.2	1.5	48
CMOs Private-Label (Non-Investment Grade)	18.9	1.1	47
Corporates (Investment Grade)	79.6	4.7	39
Corporates (Non-Investment Grade)	34.7	2.0	54
Equities	73.3	4.3	59
Money Markets	27.4	1.6	74
U.S. Treasuries (Excluding STRIPS)	474.4	27.7	39
U.S. Treasury STRIPS	38.7	2.3	46
Other	19.5	1.1	—
<b>Total</b>	<b>\$1,710.5</b>	<b>100.0%</b>	<b>38%</b>

**Distribution of Investor Haircuts in Tri-Party Repo**

Asset Group	Collateral Value (\$ Billions)	Haircuts		
		10th Percentile	Median	90th Percentile
ABSs (Investment and Non-Investment Grade)	\$ 41.7	0%	5%	8%
Agency CMOs	112.7	2	3	5
Agency Debentures (Including STRIPS)	179.5	2	2	5
Agency MBSs	584.9	2	2	4
CMOs Private-Label (Investment Grade)	25.2	2	5	7
CMOs Private-Label (Non-Investment Grade)	18.9	0	8	8
Corporates (Investment Grade)	79.6	2	5	8
Corporates (Non-Investment Grade)	34.7	5	8	15
Equities	73.3	5	8	20
Money Markets	27.4	2	3	5
U.S. Treasuries (Excluding STRIPS)	474.4	2	2	2
U.S. Treasury STRIPS	38.7	2	2	2
Other	19.5	—	—	—
<b>Total</b>	<b>\$1,710.5</b>			

*Source:* Reproduced from the FRBNY Task Force on Tri-Party Infrastructure White Paper (2010).

**Figure 18: Tri-Party Repo Statistics as of April 9, 2010**

## The financial crisis

- ▶ The financial crisis of 2007 to 2009 was a crisis not only of the traditional banks, but also of the shadow banks
- ▶ Unlike traditional banks, shadow banks don't have access to the safety nets designed to prevent wholesale runs on banks
- ▶ There was no wholesale run on the traditional banking system in this period, however there was a run on shadow banks that led to the demise of a significant part of the shadow banking system
- ▶ Since repo financing was the basis of most of the leveraged positions of the shadow banks, a large part of the run occurred through it
- ▶ Other important runs that occurred in this period were on mortgage lenders, asset-backed commercial paper (ABCP) programs, structured investment vehicles(SIVs), and money market funds

- ▶ When the housing market changed course in the first quarter of 2006, the subprime mortgage market began to deteriorate
- ▶ Since there is no secondary market for subprime mortgages and, therefore, there are no publicly observable subprime mortgage prices, the ABX index provides a publicly observable market that prices subprime risk
- ▶ The ABX index, introduced by dealer banks in January 2006, is traded via credit default swap (CDS) contracts and allows investors to take positions in sub prime mortgage backed securities

- ▶ The following figure displays the ABX spread — that is the CDS spread (labeled ABX) on the BBB-rated ABX tranche of the first vintage of the ABX in 2006
- ▶ It also shows the London Interbank Offered Rate (LIBOR)-overnight index swap (OIS) spread (labeled LIB-OIS)
- ▶ The LIB-OIS is the spread between the three-month LIBOR and the three-month overnight index swap rates, and provides a proxy for the state of the repo market
- ▶ Larger values of the LIB-OIS spread indicate higher perceived counter-party risk in the banking system
- ▶ It shows the steady deterioration of the sub prime mortgage market from January 2007 to January 2009 and compares this with the deterioration in the inter bank markets

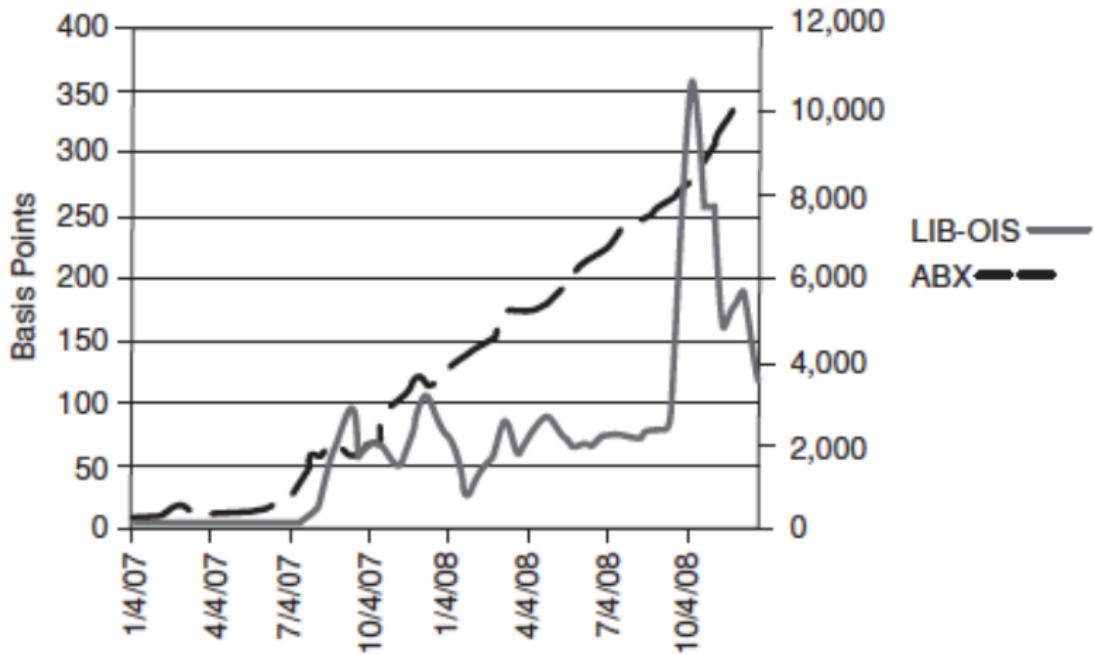


Figure 19: LIB-OIS (Left Scale) versus ABX (Right Scale, Measured in Basis Points)

- ▶ There were two large jumps in the LIB-OIS:
  1. On August 9, 2007— from 13 basis points to 40 basis points, when BNP Paribas suspended redemptions on three of its SIVs
  2. On September 15, 2008— from 87 basis points to 105 basis points, when Lehman Brothers declared bankruptcy
- ▶ The most significant move in the ABX occurred from 669 basis points at the end of June 2007 to 1738 basis points at the end of July 2007, following the collapse of two highly levered Bear Stearns hedge funds that invested in subprime mortgages
- ▶ The collapse of these two hedge funds was a run on a shadow bank in the repo market
- ▶ With the deterioration of the subprime market in the first half of 2007, creditors began asking the two Bear Stearns funds to post more collateral to back the repos by mid-June 2007

- ▶ When the funds failed to meet these margin calls, creditors threatened to declare the funds in default of repo agreements and to seize the investments
- ▶ Based on a data set obtained from dealer banks, Gorton and Metrick(2009b) studied the repo spreads and haircuts for various types of repo securities, and their results are in the following table

Series	Period	Mean	Median	Standard Error	Maximum	Minimum	Mean Haircut
BBB+ to A Corporates	Whole period	86.90	82.14	83.15	429.43	0.50	0.50 %
	First half of 2007	2.01	1.95	0.61	5.30	0.50	0.00
	Second half of 2007	61.85	65.49	36.29	126.35	1.70	0.00
	All of 2007	32.28	2.70	39.53	126.35	0.50	0.00
	All of 2008	136.19	103.63	81.61	429.43	44.33	0.90
AA to AAA Corporates	Whole period	77.59	74.78	78.42	409.43	-3.50	0.50 %
	First half of 2007	-1.69	-2.05	1.90	10.44	-3.50	0.00
	Second half of 2007	55.27	58.95	34.53	116.35	-2.30	0.00
	All of 2007	27.13	-1.35	37.64	116.35	-3.50	0.00
	All of 2008	123.86	92.11	77.57	409.43	39.33	0.90
AA to AAA ABS— Auto/CC/SL	Whole period	105.22	94.76	101.00	479.43	1.70	5.20 %
	First half of 2007	4.44	4.00	1.77	11.00	1.70	0.00
	Second half of 2007	68.44	71.78	40.93	141.35	3.70	0.90
	All of 2007	36.82	5.25	43.29	141.35	1.70	0.50
	All of 2008	167.92	119.81	98.07	479.43	54.33	9.50
AA to AAA ABS— RMBS/CMBS	Whole period	124.04	107.78	120.11	520.30	3.70	9.40 %
	First half of 2007	6.41	6.00	1.76	13.00	3.70	0.00
	Second half of 2007	76.35	81.78	43.92	151.35	5.70	1.80
	All of 2007	41.80	7.00	46.92	151.35	3.70	0.90
	All of 2008	199.44	145.08	117.27	520.30	64.33	17.10

<AA ABS—RMBS/ CMBS	Whole period	135.90	117.78	129.02	550.30	6.70	10.60%
	First half of 2007	9.41	9.00	1.76	16.00	6.70	0.00
	Second half of 2007	84.55	88.20	48.62	166.35	8.70	3.70
	All of 2007	47.43	10.00	51.08	166.35	6.70	1.90
	All of 2008	217.01	153.95	125.56	550.30	69.33	18.60
Unpriced ABS/MBS/All Subprime	Whole period	108.94	109.69	84.64	295.38	7.70	37.30%
	First half of 2007	10.41	10.00	1.76	17.00	7.70	0.00
	Second half of 2007	95.62	97.83	58.54	196.35	9.70	7.70
	All of 2007	53.52	11.00	59.59	196.35	7.70	3.90
	All of 2008	187.28	197.88	42.23	295.38	99.33	68.00
AA to AAA CLO	Whole period	134.46	117.14	127.18	545.3	3.70	10.20%
	First half of 2007	6.41	6.00	1.76	13.00	3.70	0.00
	Second half of 2007	85.93	92.65	51.27	171.35	5.70	1.80
	All of 2007	46.64	7.00	53.98	171.35	3.70	0.90
	All of 2008	214.96	148.76	121.61	545.30	79.33	18.70
AA to AAA CDO	Whole period	130.09	124.69	107.46	380.38	4.70	30.00%
	First half of 2007	7.41	7.00	1.76	14.00	4.70	0.00
	Second half of 2007	107.77	109.35	69.56	226.35	6.70	8.30
	All of 2007	58.19	8.00	70.48	226.35	4.70	4.30
	All of 2008	231.72	241.39	56.52	380.38	129.33	53.50
Unpriced CLO/CDO	Whole period	148.32	142.60	123.54	413.75	6.70	32.40%
	First half of 2007	9.41	9.00	1.76	16.00	6.70	0.00
	Second half of 2007	122.63	124.42	80.14	256.35	8.70	10.50
	All of 2007	66.69	10.00	80.34	256.35	6.70	5.40
	All of 2008	268.39	256.58	63.03	413.75	154.33	57.30

**Figure 20:** Three-Month Repo Rate—OIS Spreads (Basis Points) and Haircuts (Percentage) from January 1, 2007, to December 31, 2008

- ▶ The table shows how a crisis that started in the subprime market spread to other types of comparable nontransparent securitized debt, such as automobile, credit card, and student loan asset-backed securities, as well as the high-credit-rated structured products, such as AAA- and AA-rated CLOs and CDOs
- ▶ The following figure is reproduced from Gorton and Metrick (2009a) and shows how that run evolved

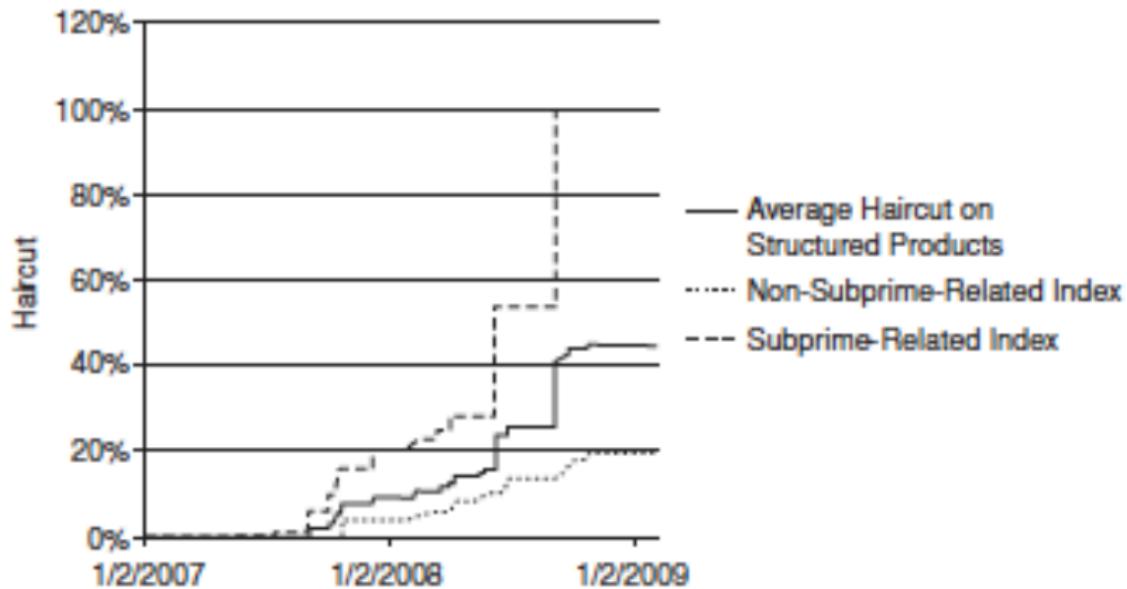


Figure 21: Repo Haircuts on Different Categories of Structured Products

- ▶ It shows that the run on the shadow banking system in the repo market occurred in two phases
- ▶ BNP Paribas's suspension of redemptions on its three SIVs triggered the first phase
- ▶ After Bear Stearns collapsed in March 2008, the Federal Reserve introduced its most radical change in monetary policy by extending its lender-of-last-resort support to the systemically important primary dealers through the new Primary Dealer Credit Facility (PDCF) which was the second phase

- ▶ The largest haircut jump occurred when there was a collapse of Lehman Brothers on September 15, 2008
- ▶ The second largest jump came in 2008, corresponds to traditional bank runs on likely insolvent banking institutions, such as IndyMac, Washington Mutual, and Wachovia
- ▶ The following table shows a quarterly summary of the primary dealer settlement fails, from the first quarter of 2007 to the last quarter of 2009

	Treasury		Agency		MBS		Corporate	
	Receive	Deliver	Receive	Deliver	Receive	Deliver	Receive	Deliver
<b>2007</b>								
Q1	\$ 738.1	\$ 586.8	\$ 91.2	\$ 76.6	\$ 474.6	\$ 473.8	\$ 356.1	\$ 404.2
Q2	726.8	528.3	117.7	118.2	595.8	617.7	498.0	572.9
Q3	834.4	549.7	239.5	231.7	805.6	819.7	822.9	884.3
Q4	1,373.0	1,085.4	202.8	192.5	757.8	686.8	488.4	547.5
<b>2008</b>								
Q1	\$ 3,946.2	\$ 3,835.7	\$ 234.7	\$ 221.8	\$ 1,023.3	\$ 952.1	\$ 364.8	\$ 413.4
Q2	3,762.9	3,726.3	202.4	192.6	596.1	566.5	361.3	407.2
Q3	3,077.4	2,784.0	238.1	228.4	463.1	425.5	199.4	214.9
Q4	16,824.6	16,266.6	586.6	600.7	971.9	863.5	271.7	337.8
<b>2009</b>								
Q1	\$ 1,442.9	\$ 1,286.0	\$ 143.1	\$ 167.1	\$ 867.8	\$ 950.3	\$ 168.0	\$ 225.8
Q2	806.6	764.8	95.4	100.9	1,078.9	1,319.4	151.6	215.6
Q3	617.7	536.8	62.1	76.7	1,283.9	1,553.2	145.2	192.4
Q4	245.0	184.4	141.9	163.9	3,128.6	3,945.1	156.7	192.2

Source: Federal Reserve Bank of New York.

**Figure 22:** Settlement Fails of US Government Securities Primary Dealers during the Financial Crisis, 2007 to 2009(Billions of dollars)

- ▶ The next figure provides a quarterly summary of the effects of the run on the repo market on the financing of primary dealers after Lehman's collapse
- ▶ It shows the borrowing ability of the primary dealers went down significantly but not their lending ability
- ▶ It also illustrates the disappearing confidence in the shadow banking system and the severity of the run on shadow banks

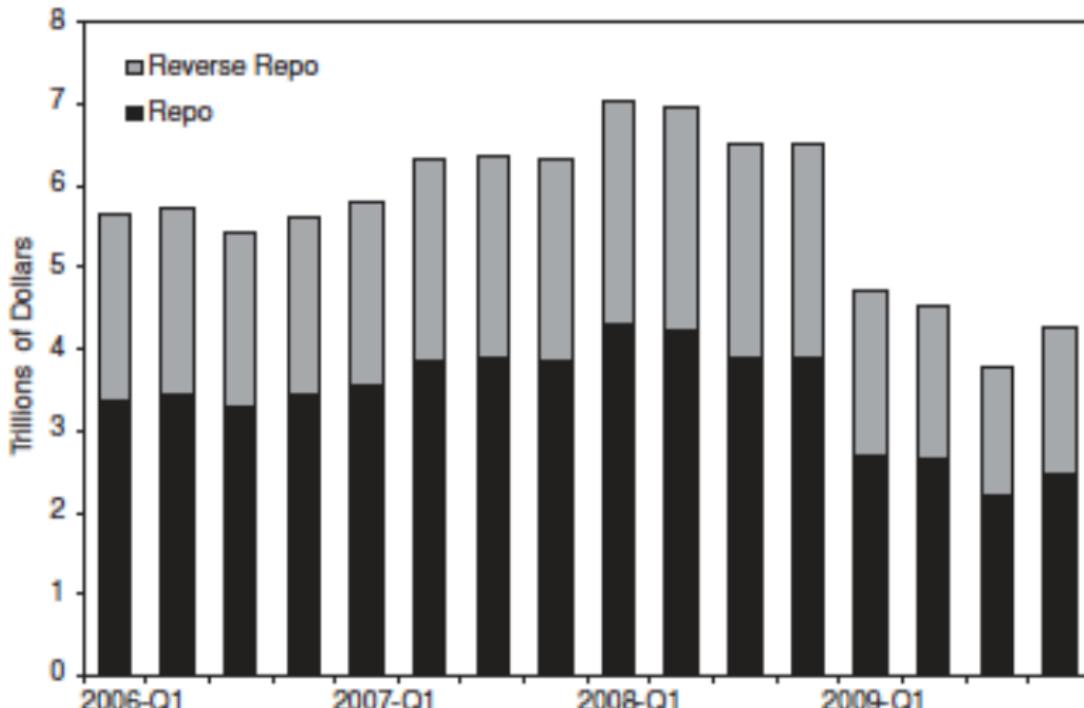


Figure 23: Quarterly Averages of Daily Financing by US Government Securities Primary Dealers, 2006 to 2009

## Reforming the repo market

- ▶ The primary issue with financing risky securities (such as mortgage-backed securities) through repo markets is that such financing is likely to experience stress in times of aggregate (economy-wide or financial-sector-wide) stress
- ▶ And on their own do not have an incentive to internalize the costs
- ▶ By being secured and having short-term financing arrangements, repo markets function smoothly
- ▶ When the underlying assets, such as Treasury or agency debt, are essentially safe, the repo lender is undeterred from rolling over the financing even in stressful times
- ▶ In contrast, if the underlying collateral is a mortgage-backed security and an economic downturn ensues, the risk of an illiquid market gets compounded because many financial institutions' portfolios have lost capital

- ▶ Unlike the liquidity risk that unsecured financing may become unavailable to a firm, the liquidity risk that secured repo financing may become unavailable to a firm is a systemic risk
- ▶ Materializing in circumstances where other financial firms are also experiencing stress and the markets for assets held predominantly by the financial sector are rendered illiquid
- ▶ There is a case for subjecting repo financed risky securities to a capital charge

## Proposed reforms

- ▶ Possible reforms of the repo market can be put into three categories: a full government-guarantee scheme, a full market-discipline scheme, and a combination of the two
- ▶ At one extreme, some (Gorton 2009) have suggested that repo financing is akin to demandable deposits in many ways and thus is similarly vulnerable to the information-sensitive panics when adverse information about underlying collateral (or counterparties) hits markets
- ▶ Under this proposal, it is recognized that repo financing has the inherent systemic fragility akin to demandable deposits, and the government would end up backing up repo counter parties were the fragility to materialize

- ▶ At another extreme, others (Roe 2009) have proposed that repo financiers should not be allowed unrestricted access to collateral even in case of default of the counterparty
- ▶ First, it prevents the fire sales of the repo collateral by the financiers and avoids the adverse dynamic
- ▶ Second, by exposing the repo financiers to credit risk of the counterparty, the financiers would subject the borrowers to greater market discipline

- ▶ The advantage of the government guarantee scheme is that it resolves all ex post uncertainty by transferring the risk of repo contracts away from financiers to government agencies for an up-front fee
- ▶ However, a fee structure gives rise to a highly pro cyclical risk-taking incentive, because, as far as the risk-return trade-off is concerned, the risks are backloaded
- ▶ The advantage of market discipline through the automatic stay approach is that it transfers the entire risk of the repo transaction to the repo financier
- ▶ However, this creates sufficient ex ante and ex post uncertainty to reduce the financier's willingness to lend against certain assets to all types of borrowers

### Preferred approach:

- ▶ In case of default of a borrower, its repo counter parties on Treasuries, and agency-backed securities are allowed to take their collateral as under the current agreement
- ▶ Immediately upon default, repo counter parties of risky collateral are paid by a repo resolution fund
- ▶ The underlying repo collateral is taken over by the repo resolution fund and liquidated in an orderly manner over a pre specified period

- ▶ This creates a credit risk that the repo market solves as follows:
  1. Include as eligible only relatively high-quality collateral
  2. Charge repo lenders an ex ante fee for the lender-of-last-resort facility
  3. Require that eligible repo lenders for the lender-of-last-resort facility meet pre-specified solvency criteria
  4. Impose a concentration limit at the level of individual repo lenders, as well as on the lender's overall portfolio size

## Hedge funds, mutual funds and ETFs

## Overview

- ▶ Hedge funds and mutual funds are major participants in the shadow banking system
- ▶ Mutual funds, intended for a retail clientele, are restricted both in terms of their regulatory regime and strategies they use
- ▶ Hedge funds are directed to high net worth individuals and institutions and have both a more relaxed regulatory regime and a wider range of investment strategies available

- ▶ These funds add value to the financial system as follows:
  1. Act as primary providers of liquidity and a source for sophisticated capital
  2. Allows the investor to achieve well-diversified portfolios
  3. Play an important corporate governance role in firms in which they hold significant equity stakes
  4. By trading on the margin and taking extensive short positions, certain hedge fund strategies provide their investors with access to significant leverage they would not otherwise have access to

- ▶ Regulators are concerned that hedge funds generate significant systemic risk through their extensive use of leverage and short positions
- ▶ Hedge funds are diverse and have little/no leverage
- ▶ However, certain hedge fund strategies are highly levered
- ▶ Which means that they can generate the counterparty risk associated with net asset value (NAV) going negative
- ▶ This counterparty risk can be systemic if the hedge funds are highly interconnected to other financial firms
- ▶ Fire sales of illiquid assets may become necessary as NAV declines, which can also generate systemic risk

- ▶ In contrast to hedge funds and mutual funds, exchange-traded funds(ETFs) do not sell or redeem individual shares for cash, but instead allow authorized participants to purchase/redeem large blocks of shares in kind by contributing or receiving
- ▶ ETFs are less susceptible to conventional runs than are hedge funds or mutual funds
- ▶ They add value by providing investors with easy access to various market segments and asset classes, including alternatives such as commodities and currencies

- ▶ An ETF provides liquidity to the markets for the securities in its basket by allowing market participants to trade and short sell the basket at very low trading costs
- ▶ The next two figures shows that total net asset value of mutual funds declined sharply in 2008 from 12,001 billion dollars at the end of 2007 to 9,603 billion dollars at the end of 2008
- ▶ However, the total net flow to mutual funds in 2008 was actually positive at 412 billion dollars and the number of mutual funds increased too

	Mutual Funds <sup>1</sup>	Closed-End Funds	ETFs <sup>2</sup>	Unit Investment Trusts	Total <sup>3</sup>
1995	\$ 2,811	\$143	\$ 1	\$73	\$ 3,028
1996	3,526	147	2	72	3,747
1997	4,468	152	7	85	4,712
1998	5,525	156	16	94	5,791
1999	6,846	147	34	92	7,119
2000	6,965	143	66	74	7,248
2001	6,975	141	83	49	7,248
2002	6,383	159	102	36	6,680
2003	7,402	214	151	36	7,803
2004	8,095	254	228	37	8,614
2005	8,891	277	301	41	9,510
2006	10,397	298	423	50	11,167
2007	12,001	313	608	53	12,975
2008	9,603	188	531	29	10,350
2009	11,121	228	777	38	12,164

<sup>1</sup> Mutual fund data include only mutual funds that report statistical information to the Investment Company Institute. The data do not include mutual funds that invest primarily in other mutual funds.

<sup>2</sup> ETF data prior to 2001 were provided by Strategic Insight Simfund; ETF data include investment companies not registered under the Investment Company Act of 1940 and exclude ETFs that primarily invest in other ETFs.

<sup>3</sup> Total investment company assets include mutual fund holdings of closed-end funds and ETFs.

**Figure 24:** Investment Company Total Net Assets by Type (Billions of Dollars, Year-End, 1995–2009)

- ▶ The decline in total net asset value of mutual funds during 2008 was driven by negative returns in 2008
- ▶ It was not until 2009 that the total net flow went negative, with an outflow of 150 billion dollars, and the number of mutual funds declined
- ▶ However, in that year, the total net asset value of mutual funds increased to 11,121 billion dollars, despite the outflow as can be seen in the following figure

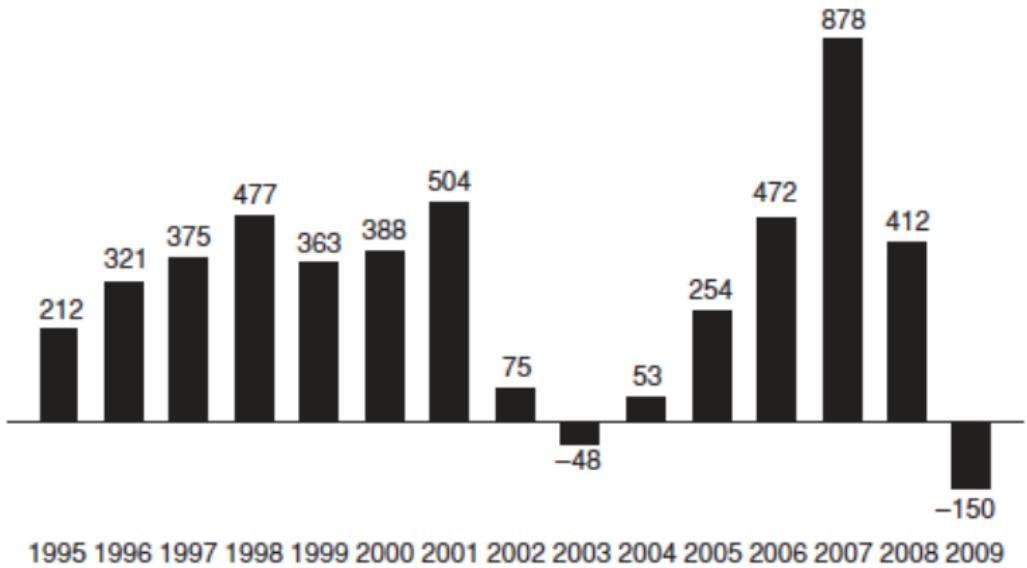


Figure 25: Net Flows to Mutual Funds (Billion dollars, 1995–2009)

- ▶ That shows how a redirection from mutual funds into hedge funds starting in 2003 but ending abruptly in 2008, as hedge fund investors fled to safety with the onset of the financial crisis
- ▶ According to Lipper TASS, these outflows, together with negative returns, caused total net assets to decline from 1.80 trillion dollars at the end of the second quarter of 2008 to 1.18 trillion dollars at the end of the first quarter of 2009
- ▶ This represents a loss of one-third of total net asset value in only three quarters

- ▶ Three channels through which hedge funds may generate systemic risk when they suffer losses:
  1. By causing prices to move away from fundamentals with their trades
  2. By no longer being able to provide liquidity to the market because of their capital erosion
  3. By generating counterparty risk when their NAVs go negative
- ▶ Leverage and short positions are more common for ETFs than for mutual funds since their portfolios are rebalanced daily, the risk of a negative NAV is negligible
- ▶ ETFs provide liquidity to markets through a different channel, by allowing units of the underlying baskets of securities to be traded at low cost

## US legislation and the EU proposal

- ▶ The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, requires hedge funds to register with the Securities and Exchange Commission (SEC) as investment advisers
- ▶ The SEC may require any investment adviser registered to maintain such records and file such reports as necessary and appropriate in the public interest and for the protection of investors, or for the assessment of systemic risk by the Financial Stability Oversight Council (FSOC)

- ▶ The records and reports required to be filed with the SEC will include a description of:
  1. The amount of assets under management and the use of leverage
  2. Counterparty credit risk exposure
  3. Trading and investment positions
  4. Valuation methodologies of the fund
  5. Types of assets held
  6. Side arrangements, whereby certain investors in a fund obtain more favorable rights or entitlements than other investors
  7. Trading practices
  8. Other information deemed necessary and appropriate in the public interest and for the protection of investors or for the assessment of systemic risk

- ▶ The Dodd-Frank Act asks for studies into the financial literacy of retail investors and into mutual fund advertising, both with a view to generating recommendations to improve investor protections
- ▶ The major differences are that hedge funds can use leverage, whereas mutual funds cannot
- ▶ Hedge funds can slow or even halt redemptions, whereas mutual funds cannot
- ▶ Long-only hedge funds have the same systemic risk characteristics as mutual funds
- ▶ The EU's proposed hedge fund directive goes further than the US bill, suggesting significant regulatory oversight and control for all hedge funds with assets in excess of EUR100 million
- ▶ It restricts the introduction of non-EU funds to enter the market

## US legislation concerning systemic risk imposed by hedge funds

- ▶ Transparency to regulators can be used to measure and manage possible systemic risk and is relatively costless
- ▶ Hedge funds will be required to provide information to the SEC if it falls in the following categories:
  1. Requires any investment adviser registered with the SEC to provide information that the SEC determines to be necessary and appropriate in the public interest
  2. Hedge funds with assets under management between 100 million dollars and 150 million dollars are exempt from registration

## US legislation concerning protection of hedge fund investors

- ▶ 25% of all hedge funds have less than 10 million dollar assets under management
- ▶ Operational risk is a more significant explanation of fund failure than is financial risk
- ▶ Financial risk events typically occur within the context of poor operational controls
- ▶ Rather have all hedge funds register with the SEC and file the mandated Form ADV disclosure
- ▶ Form ADV does not reveal competitive concerns, such as positions taken and strategies used, but it does reveal conflicts of interest, both internal and external to the fund

## US directive concerning US based funds

- ▶ The EU proposal called for strict regulation of hedge funds and a requirement that would force non-EU funds to comply with these regulations
- ▶ US Treasury however, argues that compelling non-EU funds to comply with the new rules in the directive is likely to be a protectionist law that will create barriers to the entry and continued presence of non-EU funds in the EU marketplace
- ▶ It is important that the regulatory responses to the crisis are coordinated across nations to preserve equal access to all markets
- ▶ The potential for regulatory arbitrage across markets needs to be limited

## Volcker rule

- ▶ Volcker recommends that banks be allowed to engage in the full range of commercial and investment banking functions as financial intermediaries but not be permitted to engage in such non-banking activities as proprietary trading, principal investing, commodity speculation, hedge fund and private equity fund management
- ▶ Implementation of this will likely cause the pool of hedge funds and mutual funds to increase in size and in the range of strategies offered
- ▶ It further increases the importance of having a mechanism to assess levies on hedge funds if they impose systemic risk on the financial system going forward
- ▶ It also means that hedge funds and mutual funds will no longer be competing directly with banks and other members of the banking system
- ▶ However, the hedge fund industry is likely to become more competitive with the public availability of funds whose operations were previously owned by banks

# Securitisation

## Securitisation

The process in which certain types of assets are pooled so that they can be repackaged into interest-bearing securities

- ▶ Started in 1970s - Home mortgages pooled into US government-backed agencies.
- ▶ In 1980s - other income-producing assets
- ▶ Subprime Mortgage crisis gave securitisation a bad name - the unexpected deterioration in the quality of some of the underlying assets undermined investor confidence

## Why securitise?

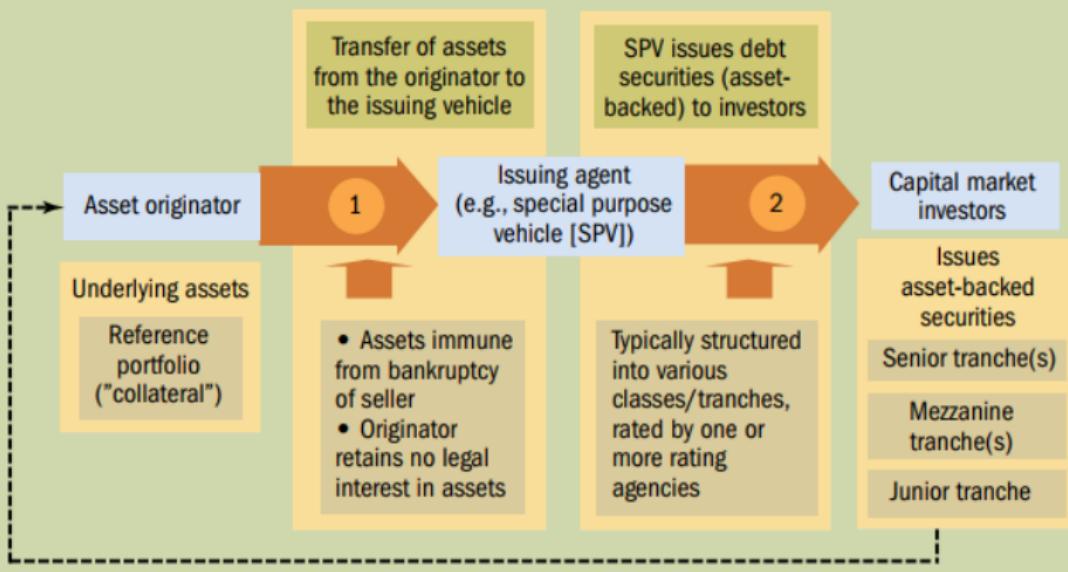
- ▶ transfer credit risk
- ▶ It is often cheaper to raise money through securitization
- ▶ Securitized assets were previously less costly for banks to hold because financial regulators had different standards for them than for the assets that underpinned them
- ▶ Originate to distribute → spreads out credit

## The good and the bad

- ▶ Until the subprime crisis unfolded, the impact of securitization appeared largely to be positive and benign:
- ▶ But - compromising incentives to ensure minimum standards of prudent lending, risk management and investment new sour

# The process of securitisation

## How securitization works



## The allure

- ▶ New sources of funding: Could take a loan or sell bonds for example, but ability and cost to do this would depend on its credit rating
- ▶ By pooling assets the company can raise cash by selling the package to an issuer, which in turn converts the pool of leases into a tradable security
- ▶ Assets are detached from the originators balance sheet and its credit rating
- ▶ Does not inflate a company's liabilities
- ▶ Increases range of investible assets, issuers tailor the risk-return properties of tranches to the risk tolerance of investors

# Regulating OTC derivatives

## Overview

- ▶ Over-the-counter (OTC) derivatives account for a significant proportion of overall banking and intermediation activity
- ▶ They enable end users like corporations, including industrial and financial firms to hedge their underlying risk exposures in a customized manner
- ▶ They also enable banks and other financial intermediaries to earn profits, as they in turn hedge the customized OTC products they sell
- ▶ They do so either by diversifying the risk across different end users or by shedding the risk to other intermediaries via liquid markets for standardized derivatives
- ▶ Interest rate swaps, for example, are the largest segment of OTC derivative markets and have contributed remarkably to the management of interest rate risk on corporate and commercial bank balance sheets

- ▶ The financial crisis of 2007 to 2009 highlighted aspects of the OTC derivatives markets such as financial innovation, this is also where banks can tailor their own risk taking and leverage buildup
- ▶ Primary concerns surrounding the failures of Bear Stearns, Lehman Brothers, and American International Group (AIG) all had to do with uncertainty about how counterparty risk would spread through OTC connections, particularly in the market for credit default swaps (CDSs)
- ▶ The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 as far as derivatives reform is concerned can be considered to address these issues of leverage and opacity in those derivatives that are traded over the counter

## Wall street transparency and accountability part of the Dodd-Frank act of 2010

- ▶ The proposed legislation called for changes in the structure (centralized trading versus over-the-counter trading) and regulation (margin requirements and transparency) of derivatives
- ▶ Coverage of derivatives: The Act repeals the provision under the Gramm-Leach-Bliley Act (GLBA), also known as the Financial Services Modernization Act of 1999, that prohibited the regulation of OTC derivatives
- ▶ It also contained a specific clause that states that derivative contracts ("swaps") are not "insurance" contracts and precludes them being regulated as such
- ▶ Clearing requirements: The default treatment of derivatives under the Act will be that they remain uncleared

- ▶ The exemption process to this default treatment has been clearly laid out with the intention that several products will, in fact be centrally cleared
- ▶ The Act requires that within a year from its enactment, the “Commission” (the SEC and the CFTC) shall adopt rules for reviewing a derivatives clearing organization’s bid for the kind of derivatives it seeks to accept for clearing
- ▶ If a set of derivatives is to be allowed for central clearing, then the Commission will allow a 30-day comment period before the clearing commences
- ▶ Central clearing is based on outstanding interest, liquidity, pricing, trading infrastructure, mitigation of systemic risk taking account of the size of the market and clearing resources, the effect on competition, and clarity on resolution of insolvency of the clearing agency

- ▶ Clearinghouse management: clearinghouses must be approved and reviewed based on their ability to provide needed financial resources for clearing and operational expertise
- ▶ It requires them to provide public disclosure of contract terms, fees, margin methods, daily prices, volumes, open interest, governance structure, conflicts of interest for the products they clear
- ▶ A “clearinghouse will have adequate collateral to cover the default by a participant creating the largest financial exposure for that organization in extreme but plausible conditions

- ▶ Uncleared swaps: This is the default option for a derivative under the Act
- ▶ They may be subject to margin and collateral requirements in order to offset the risks they pose, as well as transparency requirements
- ▶ Transparency: requires that all existing derivative positions be reported to a swap data repository within 180 days of its enactment and all new positions starting 90 days after the enactment
- ▶ Bankruptcy exemption: A security-based swap is treated as a sale and repurchase transaction in case of bankruptcy of one of the counterparties

- ▶ Collateral segregation: For cleared derivatives transactions, it requires both segregation of a counterparty's collateral and prohibition of commingling of such collateral with own funds, requiring that a customer's collateral be treated, dealt with and accounted for as belonging only to the customer
- ▶ Systemically important institutions in derivatives markets: Major swap participants and swap dealers will be required to register with the Commission
- ▶ Position limits, position accountability, and large trade reporting: requires the Commission to establish limits, taking account of the hedge exemption provisions and on the size of a position in any swap that may be held by any person or institution
- ▶ De minimis investment requirement: derivatives trading activity does not necessarily qualify as "proprietary trading" as far as the Volcker Rule is concerned

- ▶ Under this rule, banks retain the right to engage in hedge fund and private equity fund investments subject to a cap limiting those investments to 3% of the funds' capital and no more than 3% of the banks' Tier 1 capital
- ▶ Leverage limitation requirement: requires the Federal Reserve to impose a maximum debt-to-equity leverage ratio of 15 : 1 on any financial company that the Council determines poses a "grave threat" to the US financial stability
- ▶ The Lincoln Amendment: allows insured depository institutions to engage in "bona fide hedging and traditional bank activities" on their books

- ▶ Prohibition on lender of last resort support: Imposes that from two years after the Act becomes effective, no Federal assistance may be provided to any swaps entity with respect to any of its activities
- ▶ Foreign platforms (boards of trade): The Act provides the Commission authority to require registration of foreign boards of trade that provide direct access to US market participants to their electronic trading and order matching system
- ▶ International harmonization: The Act provides for the right levels of international harmonization in terms of setting standards for the regulation of derivatives and information sharing about derivatives positions

## Evaluation of proposed reforms

- ▶ Aspects of the Act that directly address derivatives activity that would remain on banks' books even after passage of the Act such as:
  1. Derivatives that are standardized and have reasonable trading volumes would be considered for central clearing and those that continue to trade OTC would be regulated in a "comparable" manner
  2. Transparency of all derivatives trades
  3. Bankruptcy issues relating to derivatives, the modified Lincoln Amendment and the restriction of federal assistance for swap entities

- ▶ Regulators will decide the particular types of derivatives that would be required to be centrally cleared
- ▶ This requires detailed market knowledge and are not suitable for congressional debate and legislation
- ▶ Also, it requires significant human resources to be allocated to the relevant regulators

- ▶ The exact implementation of clearing provisions should contain the moral hazard of the clearinghouses, given their systemic importance
- ▶ As they become more systemically important, there is the risk of a replay of the recent crisis should the clearinghouses become the future government-sponsored enterprises (GSEs)
- ▶ Although their limited risk choices relative to private institutions make the moral hazard issue easier to deal with, given their systemic importance, it is critical that their risk standards be constantly maintained
- ▶ It requires the regulators to charge margins for OTC positions in a manner that would be similar for cleared varieties of these positions and also empowers them to take adequate actions against evasive positions
- ▶ The Act's biggest strength lies in legislating counterparty-level transparency for the regulators, price volume-level transparency for all market participants, and aggregated transparency of positions and players in different derivatives markets (twice a year)

- ▶ The transparency standard could be improved as follows:
  1. Collateral backing different contracts (so as to ascertain the counterparty risk “exposure”)
  2. Potential exposures in stress scenarios rather than just current exposures that tend to be small in good times
  3. The largest such potential exposures of a derivatives player to different counterparties
- ▶ Looking at the modified Lincoln Amendment, the underlying rationale for requiring derivatives to be separately capitalized is to ease the resolution of the bank holding company that gets into trouble: The derivatives affiliate could simply be spun off, given its adequate capitalization

- ▶ The Act's proposals for derivatives are the weakest in the area of bankruptcy resolution relating to derivatives and swap entities
- ▶ There are three issues that raise concerns:
  1. The restriction on federal assistance to swap entities, including clearinghouses, seems to rule out an important mechanism to deal ex post with systemic risk
  2. In the event that a clearinghouse gets to the point of insolvency, the Act explicitly prohibits its positions from being transferred to another clearinghouse
  3. In the case of sale and repurchase agreements (repo markets), there is a case for softening the bankruptcy exemption for derivative transactions in scenarios where there is a systemically important counterparty that is going bankrupt

- ▶ The costs and benefits of the migration from OTC to centralized clearing can be considered and evaluated for other markets, such as interest rate, FX and commodity derivatives
- ▶ The main reason is that the credit derivatives market is where most of the systemic consequences manifested themselves in the current crisis and where the underlying risk transfers are largely between financial firms

## Clearing, margins, transparency and systemic risk of clearhouses

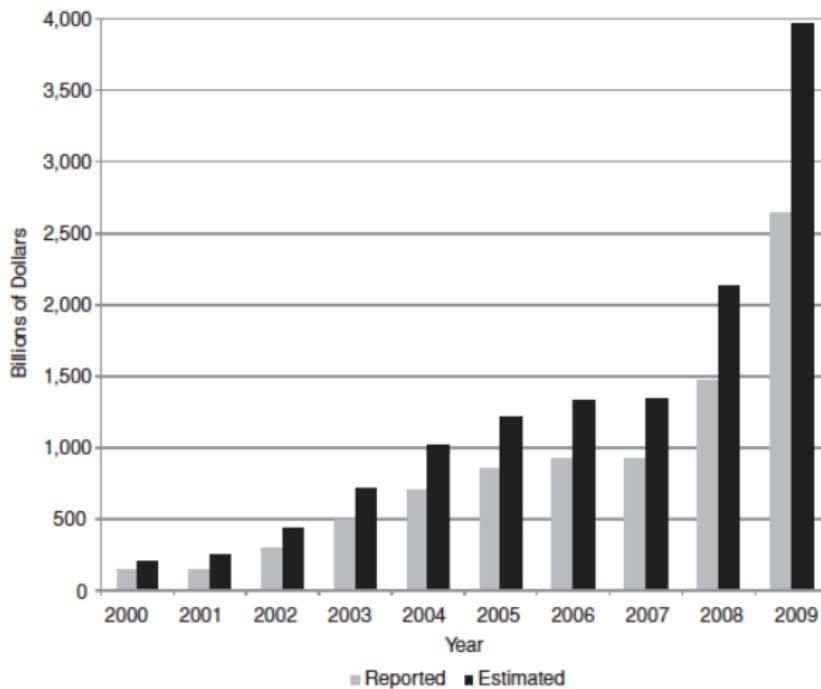
- ▶ The growth of OTC derivatives in recent years makes them top candidates for proposed regulations
- ▶ Key issue with any derivative contract is that of collateral (or margin) requirements
- ▶ If collateral requirements are too low, then counterparty risk issues occur
- ▶ In contrast, if they are too high, they may remove any advantage of the derivative relative to managing risks simply by holding cash reserves
- ▶ One possible way to eliminate the counterparty risk would be to require collateral equal to the full principal amount on all of a protection seller's swaps, but that's costly

- ▶ Alternatively, require the protection seller to post a margin equal to 100% of its single largest exposure to an individual reference entity
- ▶ This additional margin would guarantee that the protection seller could always cover the potential liability from any single credit event that it has sold protection against
- ▶ Main feature of CDS contracts that distinguishes them from other derivatives is that there are no obvious sellers of protection who are hedged by other positions as end users
- ▶ This is in contrast to FX and interest rate derivatives, where there could be end users whose positions are opposite to each other, so that the hedging activity actually reduces systemic risk

- ▶ To minimize regulatory overload, other derivative markets could be added over time
- ▶ While CDS reforms are being put in place, regulators should require disclosures by the concerned parties to understand the quality of bilateral margining and risk management in interest rate, currency and commodities derivatives
- ▶ Based on such information, policymakers would be able to better assess whether and what kind of additional regulation is needed in these markets

- ▶ On the one hand, single-name CDSs on corporations and sovereigns will likely move to central clearing platforms and possibly over time move to exchanges
- ▶ This reduces the opacity of these products
- ▶ Since the bill requires transparency primarily for cleared derivatives, the status of uncleared derivatives markets remains open
- ▶ Instead of requiring mandatory disclosures of these remaining OTC positions, regulators impose margins or capital requirements to get trading to move to centrally cleared products
- ▶ The International Swaps and Derivatives Association (ISDA) conducted its first survey of collateral use in the OTC derivatives industry among its 67 member firms, including the top five banks—Goldman Sachs, Citigroup, JPMorgan Chase, Bank of America and Morgan Stanley in 2000

- ▶ The reported number of collateral agreements in place has grown from about 12 000 to almost 151 000
- ▶ While the estimated amount of collateral in circulation has grown from about 200 billion dollars to an estimated 2.1 trillion dollars at the end of 2008 and an estimated amount of almost 4 trillion dollars at the end of 2009
- ▶ There is a trend toward increased collateral coverage, in terms of both amount of credit exposure and the number of trades (seen by the following figures)
- ▶ The use of cash collateral has also continued to grow in importance among most financial firms, and now stands at almost 84% of collateral received and 83% of collateral delivered, up from 78% and 83%, respectively, at the end of 2008



**Figure 26:** Growth of Value of Total Reported and Estimated Collateral, 2000 to 2009 (Billion dollars)

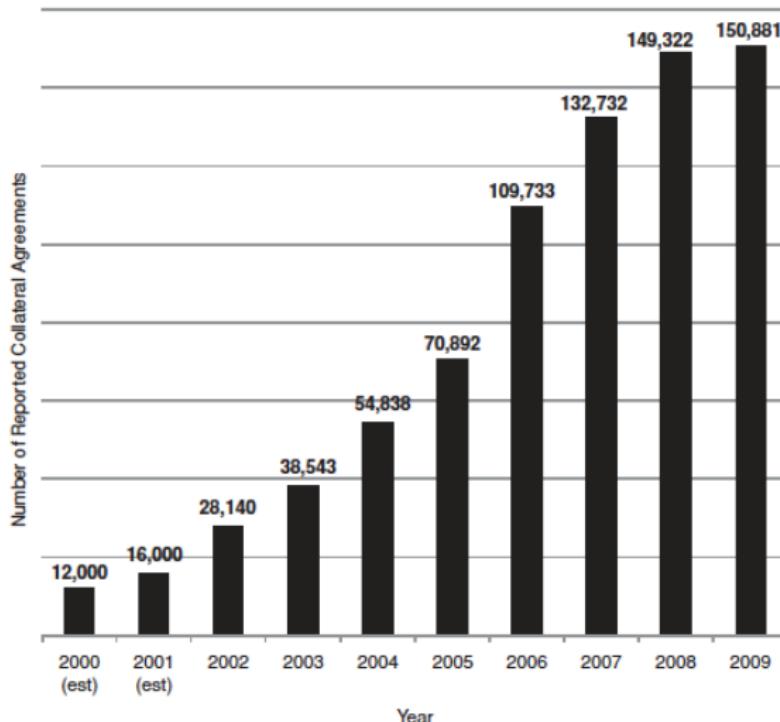


Figure 27: Growth of Reported Collateral Agreements, 2000 to 2009

- ▶ The increase in cash and government securities was balanced by a decline in the use of other forms of collateral such as corporate bonds and equities
- ▶ When collateralized transactions are categorized by size, there is a significant variation in the counterparty mix relating to collateral arrangements
- ▶ Most collateral agreements among large firms are with hedge funds and institutional investors (50%), followed by corporations (15%), banks (13%) and other (21%)

- ▶ Approximately one-half of the collateral agreements at medium-sized financial firms are with other banks and corporations
- ▶ Medium-sized firms deal with hedge funds and institutional investors but to a relatively smaller extent than large firms
- ▶ Other counterparties include commodity trading firms, special purpose vehicles, sovereigns, supranationals, private banking clients, and municipalities, represent 21% of counterparties at large firms, 10% at medium firms and only 1% at small firms
- ▶ The following table shows the nature of counterparties involved in collateral arrangements and the percentage of trades subject to collateral arrangements that varies across different types of underlying contracts

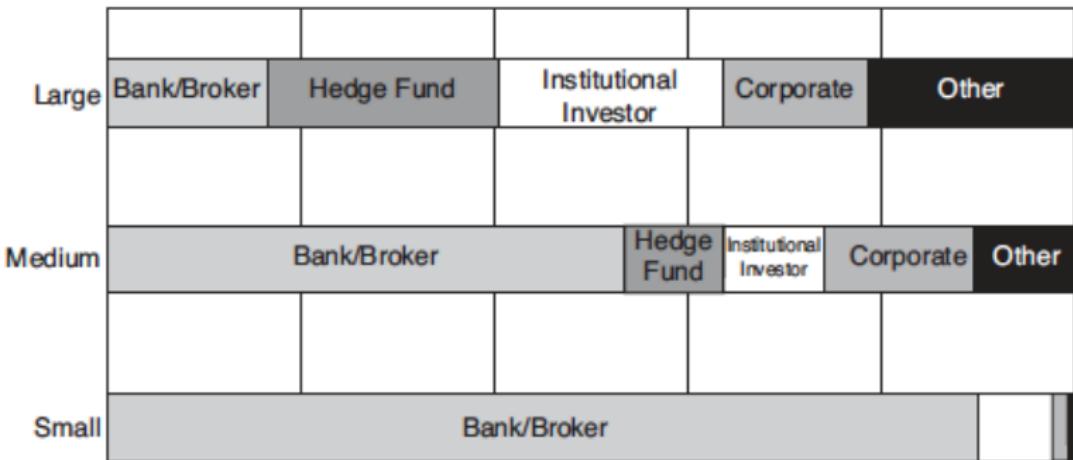


Figure 28: Counterparties of Collateralized Transactions

- ▶ These differences are reflective of the variation in the risk of the underlying trades and counterparties, as well as the specific size of the market segment and its development
- ▶ Credit and fixed income are the most collateralized types of OTC derivative contracts (60% to 70% of trade volume and exposure that is collateralized) whereas FX, equity, and commodities show less (between 45% and 50% of trade volume and exposure)
- ▶ International Monetary Fund (IMF) research on the counterparty risk stemming from OTC derivatives finds that a large part of the counterparty risk in this market remains undercollateralized (i.e., up to 2 trillion dollars) relative to the risk in the system

- ▶ This is close to the 2 trillion dollars net credit exposure presented by the Bank of International Settlements (BIS)
- ▶ The IMF estimates that the five key US banks mentioned before are jointly carrying almost 500 billion dollars in OTC derivative payables exposure as of the third quarter of 2009
- ▶ The five largest European banks— Deutsche Bank, Barclays, UBS, Royal Bank of Scotland (RBS) and Credit Suisse— had about 600 billion dollars to 700 billion dollars in undercollateralized risk (measured by residual derivative payables) as of December 2008

- ▶ The residual exposure arises for two reasons:
  1. Sovereigns, AAA-rated insurers, corporations, large banks and multilateral institutions don't post adequate collateral since large complex financial institutions are seen as privileged and safe clients
  2. Based on the bilateral nature of the contracts, dealers have agreed not to mandate adequate collateral for dealer-to-dealer positions

- ▶ It is estimated that if the two-thirds of OTC contracts that are standardized were shifted into clearinghouses, banks would need to find over 200 billion dollars in initial margins and guarantee funds: An extra 80 billion dollars would be needed to cover clearing of CDSs, 40 billion dollars to 50 billion dollars for interest rate swaps and 90 billion dollars for equities, foreign exchanges and commodities
- ▶ A better solution than increased margin requirements would be to require transparency of the exposures of dealers and large swap players to all OTC products, not just centrally cleared ones, and at regular intervals

- ▶ Transparency can be acquired by the following:
- ▶ Classification of exposure:
  1. Product types (such as single-name or index CDSs, interest rate swaps, currency swaps)
  2. Type of counterparty (bank, broker-dealer, corporation, monoline)
  3. Maturity of contracts
  4. Credit rating of counterparties

► Size of exposures:

1. As gross (maximum notional exposure)
2. As net (taking account of bilateral netting arrangements).
3. As uncollateralized net (recognizing collateral posted by counterparties)
4. Uncollateralized net exposures should be further modified and stated also as potential exposures based on stress tests that take account of replacement risk for the exposures
5. Concentration reports should be provided, and detail the aforementioned information for the entity's largest counterparty exposures (the largest 5 or 10) that account for a substantial proportion of the total exposure, 75%
6. Margin call report that lists the additional collateral liabilities of the firm as: total additional liability in case the firm experiences downgrades.
7. The largest such liabilities aggregated by different counterparties (e.g. the five largest)

- ▶ Main participants in overall derivatives are large financial firms: commercial and investment banks, mutual funds, pension funds, hedge funds and insurance companies
- ▶ In the US, the derivatives market is dominated by the financial industry and five banks in particular
- ▶ JPMorgan Chase, Bank of America, Goldman Sachs, Citigroup, and Morgan Stanley account for more than 96% of the total industry notional amount and about 80% of industry net current credit exposure
- ▶ The next two figures show the shares of these top five banks in different markets and the outstanding notional amounts of derivative contracts by each bank, with JPMorgan Chase alone accounting for more than 30% of market trading volume, respectively

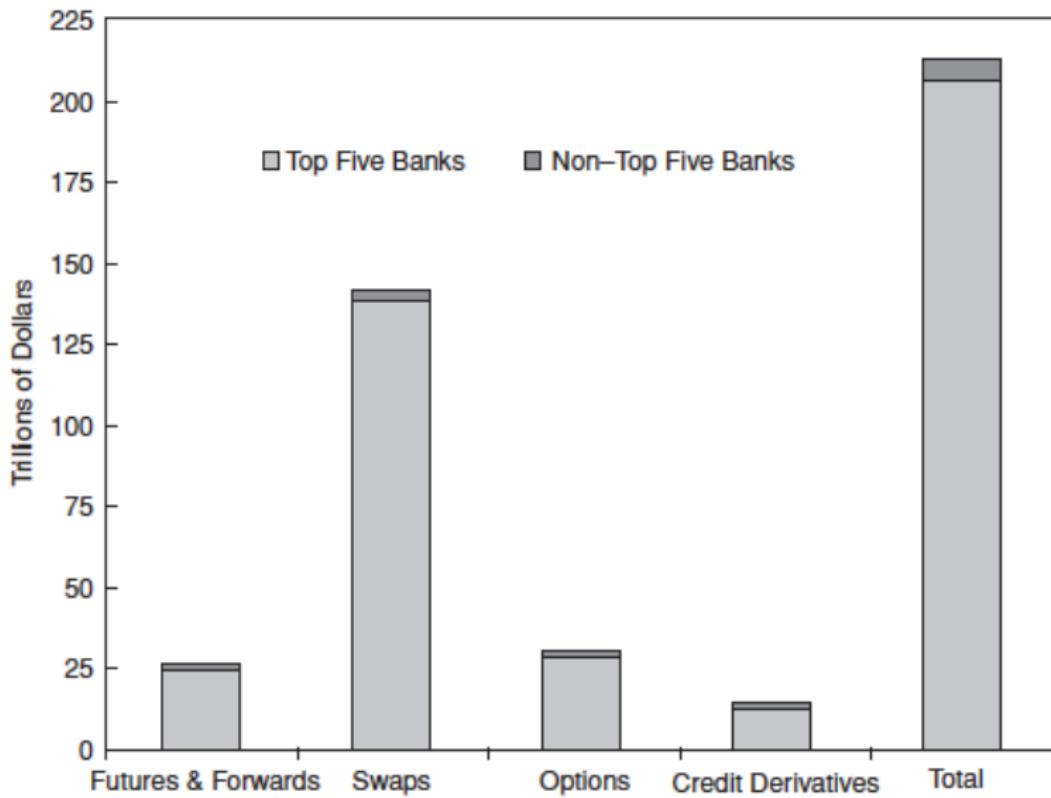


Figure 29: Concentration of Derivative Contracts—All Commercial Banks, 4Q09 (Trillion dollars)

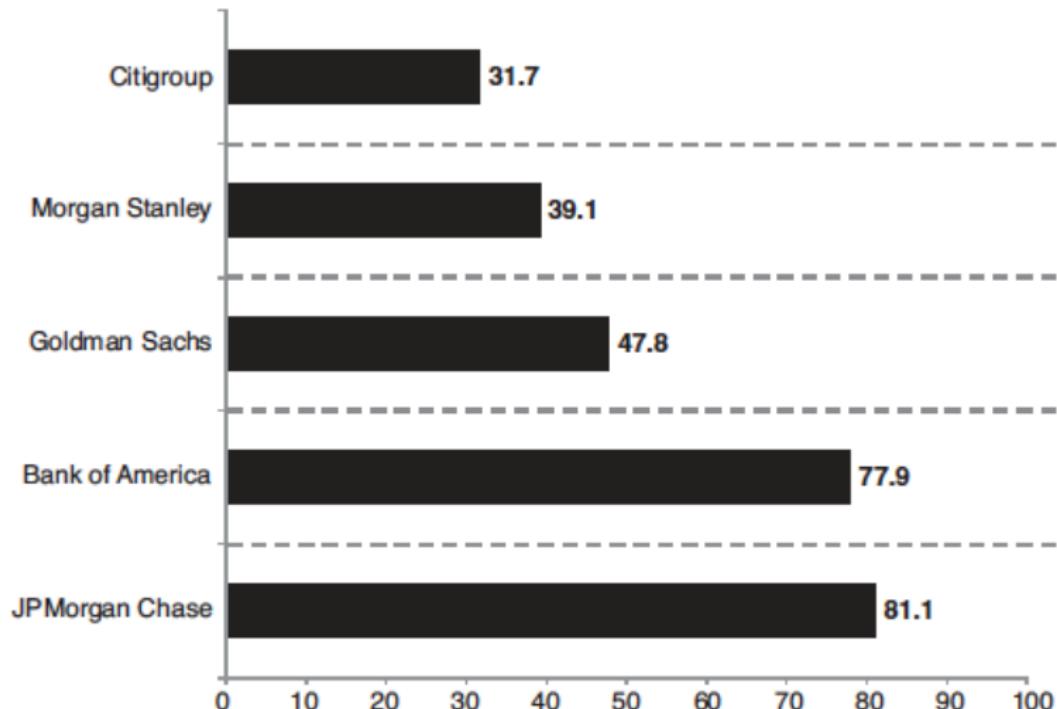


Figure 30: Notional Value of Derivatives Contracts Outstanding Held by US Banks as of 1Q09 (Trillion dollars)

- ▶ According to a 2009 ISDA survey, 94% of the world's 500 largest companies, located in 32 different countries, made use of derivatives
- ▶ It includes 92% of US companies, 100% of UK companies, 97% of German companies, 100% of French companies and 100% of Japanese companies
- ▶ The following table shows the assets and liabilities for the selected companies in each industry
- ▶ In the financial services industry, the most important user segment (the top five banks put aside), 36 companies were reviewed in the Fitch report
- ▶ Of these 36, only four institutions had no exposure to derivatives

- ▶ Fitch reviewed 13 regional banks, and it seems that trading activity in derivatives by these banks is not as extensive as by the larger national banks
- ▶ The study shows that interest rate derivatives make up an average 85% of total net exposure, while currency derivatives make up an average 7% of total exposure
- ▶ In the insurance industry, interest rate derivatives dominate on the balance sheets of the four reviewed companies
- ▶ AIG and MBIA Inc. show sizable total notional amounts for net credit derivatives written (AIG 256 billion dollars, MBIA 165 billion dollars)

	Company	Total Assets	Total Derivative Assets <sup>a</sup>	Total Derivative Liabilities <sup>a</sup>
Selected Insurance Companies	American International Group	819,758	10,192	5,197
	MetLife, Inc.	491,408	9,351	4,009
	Prudential Financial	427,529	7,430 <sup>b</sup>	4,621 <sup>b</sup>
	MBIA Inc.	27,907	1,126	5,332
Selected Utilities and Power Companies	Duke Energy Corporation	53,584	491	649
	Southern Company	49,557	20	461
	Exelon Corporation	48,863	1,437	506
	American Electric Power	45,865	710	353
	FPL Group, Inc.	45,304	1,016	1,762
	Edison Int'l	44,429	950	948
	Dominion Resources, Inc.	41,687	2,219	2,219
	PG&E Corporation	41,335	298	542
	Entergy Corporation	36,613	351	91
	AES Corporation	34,838	202	467
	Consolidated Edison, Inc.	34,224	279	464
	FirstEnergy Corporation	33,557	383	869
	Progress Energy, Inc.	30,903	5	935
Selected Energy and Oil Companies	Centerpoint Energy, Inc.	19,676	142	221
	Exxon Mobil Corporation	222,491	NA	NA
	ConocoPhillips	143,251	7,442	7,211
	Anadarko Petroleum Corporation	48,154	533	84
	XTO Energy, Inc.	37,056	2,397	66
	Chesapeake Energy Corporation	29,661	1,978	635
	El Paso Corporation	22,424	873	896
	Spectra Energy Corporation	21,417	26	22

<sup>a</sup>Includes the impact of netting adjustments.

<sup>b</sup>Presented gross without netting benefits.

Source: Fitch Ratings, quarterly filings

Figure 31: Derivative Assets and Liabilities as of June 6, 2009 ( Million dollars)

- ▶ Fitch also reviewed the derivatives disclosure of 14 utilities and power companies
- ▶ Utilities traditionally have used derivatives to hedge pricing exposures within regulated business lines
- ▶ In response to deregulation and the development of active energy trading markets, many power and gas companies also developed proprietary trading operations that allowed them to speculate on derivatives, above and beyond what was necessary to hedge their own production and purchasing
- ▶ Since the Enron bankruptcy, the resulting changes to accounting rules governing energy contracts require more detailed disclosure, many of these companies have either disbanded or sold their trading functions
- ▶ Of the 14 utilities reviewed, only three companies (Dominion Resources Inc, Exelon Corporation, and FPL Group Inc) disclosed the use of derivatives for proprietary trading

- ▶ Enhanced transparency and reduced counterparty risk of derivatives, dealers ought to benefit end users directly in terms of the risks and costs they ultimately bear
- ▶ In contrast to current practices, up-front capital injections held directly by dealers would reduce the default risk that end users face
- ▶ Under the proposed reforms, dealer activities are intended to be efficiently margined by regulators to contain the systemic risk they pose on others, end users also pay at least a part of this price
- ▶ The alternative scenario where these risks are not borne and paid for by the beneficiaries — dealers and end users — are underwritten by taxpayers at large if dealers default is sub-optimal

- ▶ As proposed in the Act, end users that choose not to be classified as dealers follow the same set of regulations as if these end users violate certain criteria regarding their hedging status
- ▶ In particular, end users should be required to provide hedge documentation of their derivatives trades detailing their underlying exposures
- ▶ This hedge documentation must be subject to regular audits
- ▶ End users whose audits reveal shortcomings, or who are found to be maintaining substantial one-way derivatives position bets more appropriate for a dealer's warehouse or a speculative desk, should be subject to penalties and potentially have their hedger exception revoked for a sufficiently long period

- ▶ Since the legislation of the Dodd-Frank act, a central counterparty (CCP) clearinghouse for OTC derivatives is a good way to reduce counterparty credit risk
- ▶ The CCP stands between the two original counter parties, acting as the seller to the original buyer, and as the buyer to the original seller
- ▶ Because its long and short positions are automatically offsetting, a CCP has no losses or gains on a derivatives contract so long as the original counter parties to the trade continue to perform

- ▶ The CCP is exposed to a counterparty credit risk from each of its participants
- ▶ To minimize this risk, a CCP relies on a range of controls and methods, including stringent membership access, a robust margining regime, clear default management procedures, and significant financial resources that back its performance
- ▶ A clearinghouse can lead to a substantial reduction in risk and a substantial improvement in allocational efficiency
- ▶ It also allows market participants to reduce the amount of margin against their exposures if many contracts clear through the same clearinghouse
- ▶ Joint clearing of different derivative products in the same CCP also increases the incentives for market participants to clear their derivatives trades without increasing systemic risk
- ▶ If there are too many clearinghouses, regulators run the risk of increasing the systemic risk posed by OTC derivatives due to fragmented trading as well as excessive use of collateral

- ▶ An example of a clearinghouse failure: In 1974, a sharp price increase in the Paris White Sugar Market with a subsequent correction prompted the default of participants on margin calls, as a result, the Caisse de Liquidation market was closed by the French commerce ministry
- ▶ Instances in recent US history when exchanges were on the brink of collapse:
  1. In the 1970s, two short episodes in the commodity futures market caused serious liquidity problems with settlement delays
  2. In 1976, as a result of a manipulation in the Maine potato futures contract on the New York Mercantile Exchange (NYMEX), the largest default in the history of commodity futures trading occurred on some 1,000 contracts that covered 50 million pounds of potatoes

- ▶ The collapse of Lehman Brothers in September 2008 was due to clearinghouse failures
- ▶ Lehman Brothers had 4 billion dollars in margin accounts to backstop commitments for customers and also had large proprietary bets on energy, interest rate and stock index futures on the CME
- ▶ They ordered Lehman Brothers to liquidate bets made with their own money, but rather than selling off these positions, they continued to add to them for another two days
- ▶ The CME then conducted a forced transfer of the bank's positions

- ▶ While clearinghouses are systemic and perhaps too-big-to-fail members of the financial sector, their risk-taking activities have a limited scope, and on balance the moral hazard in their case is also somewhat limited
- ▶ Hence competition among exchanges don't appear to have caused a race to the bottom in terms of risk management and control

- ▶ Four key areas where the proposed OTC reforms of the Dodd Frank Act will have the greatest global impact:
  1. Consolidation within the US and across countries of clearinghouses, exchanges and potentially also of large dealer banks
  2. Emergence of global transparency platforms and services related to processing of newly made available data on derivatives transactions and positions
  3. Gradual transition of end-user hedging demand to centralized platforms and exchanges
  4. Separation of market making and proprietary trading/asset management positions in large financial institutions

- ▶ Two economic reasons why consolidation across clearinghouses and exchanges is likely to take off following the proposed OTC reforms:
  1. Centralized clearing will likely occur separately within the individual product spaces
  2. Due to transparency, a market response to such need is likely to emerge in the form of global clearing services being provided by players such as the Depository Trust and Clearing Corporation (DTCC), as well as in the form of global information gathering and dissemination

- ▶ Greater standardization of products would facilitate such global aggregation and the consolidation proposed would also necessitate such global data repositories
- ▶ The Office of Financial Research (OFR), proposed in the Dodd-Frank Act, will be charged with the task of collecting transaction-level data and organizing it in forms that aid understanding of systemic risk
- ▶ While derivatives have their natural use in hedging when markets are incomplete, they also facilitate leverage, which has been found to be a key contributor to systemic risk in past financial crises
- ▶ Regulating leverage requires certain improvements in the trading infrastructure of derivatives and possibly some restrictions on derivatives positions of large players

Day 10 session 1  
Focus on South Africa - the banks and the  
regulators

## The first bank in South Africa

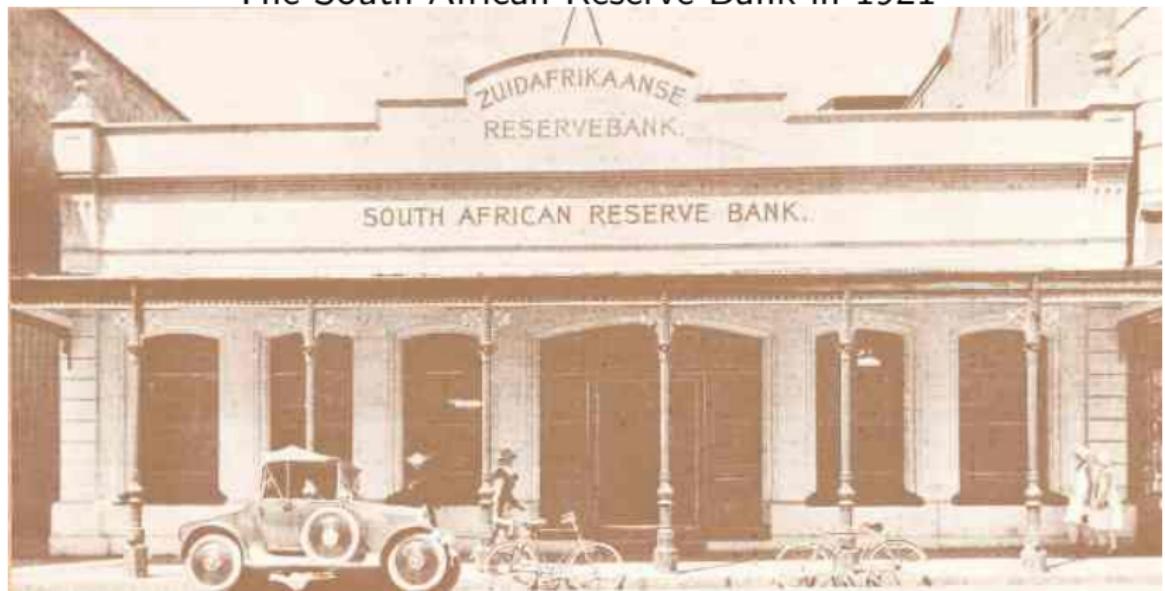
- ▶ In 1782, the Dutch Governor Van Plettenberg was obliged to introduce, for the first time in the history of the Cape, paper money, owing to his inability to procure a sufficient quantity of coinage from the Netherlands for the requirements of the settlement.
- ▶ ⇒ paper money was issued in rixdollar and stiver denominations, the currency of the Cape at that time
- ▶ Until 1803 - No printing press → all the notes until about 1803 had to be hand written
- ▶ The first bank in South Africa: Lombaard Bank in Cape Town - 1793, state-owned.
- ▶ This bank was entrusted with the issuing of the Government notes.
- ▶ It closed in 1883, being forced out of business by the private banks.

## More private banks

- ▶ As trade expanded approximately 30 banks sprang up between 1837 and 1882
- ▶ Most of them issued their own paper money, some only in one, others in more than one denomination
- ▶ In 1877 an imperial bank, the Standard Bank of British South Africa Ltd., opened its doors in Cape Town
- ▶ Two other imperial banks entered the Cape subsequently
- ▶ If these new banks issued their own paper money. With large capital behind them they made it their business to open up branches throughout the Colony, and to take over as many of the remaining private banks as was possible
- ▶ By 1892, they had absorbed all but one of these (the Stellenbosch District Bank)

Source: South African Reserve Bank

The South African Reserve Bank in 1921



## The South African Reserve Bank

- ▶ The earliest proposals for the establishment of a central bank in South Africa were made as far back as 1879
- ▶ a select committee, consisting of the ten members of Parliament was established on 31 March 1920 to examine the practicalities of establishing a central bank
- ▶ Following on the recommendations of the committee, the South African Reserve Bank opened for business on 30 June 1921
- ▶ → oldest central bank in Africa
- ▶ The first banknotes were issued to the public by the Bank on 19 April 1922

Source: South African Reserve Bank

## The South African Reserve Bank

- ▶ Bank Supervision Department
- ▶ Financial Stability Department
- ▶ National Payment System
- ▶ Foreign Exchange regulation

# The South African Reserve Bank

- ▶ Monetary Policy decisions
- ▶ Financial Stability decisions

## The South African Reserve Bank - Financial Stability Mandate

When considering such responsibility, the Bank looked at what such a macro prudential mandate needs to take into account, and this could entail;

- ▶ Assessing risks to system wide stability
- ▶ Sharing risk assessment with other agencies / the public
- ▶ Contributing to the development of macro prudential instruments and policies
- ▶ Developing and implementing any discretionary policy actions to mitigate risks
- ▶ Recognising that there may be different time horizons that are appropriate for different decisions
- ▶ Needing to ensure that there is a longer term horizon when resolving financial stability crises.

Source: South African Reserve Bank

## The South African Reserve Bank - Financial Stability

- ▶ The Minister of Finance, in his budget speech on 23 February 2011, announced a move towards a "twin-peaks" approach to the regulatory architecture in South Africa.

Source: South African Reserve Bank

# Financial Services Board - FSB



FINANCIAL SERVICES BOARD

Promote and Maintain a sound financial investment environment in South Africa

an independent institution established by statute to oversee the South African Non-Banking Financial Services Industry in the public interest. Its mission and vision are to promote and maintain a sound financial investment in South Africa.

- ▶ established in 1991
- ▶ a number of additional acts have expanded and increased the role of the FSB. These include:
  - ▶ Financial Intelligence Centre Act (2001) - added responsibilities to the FSB to combat money laundering
  - ▶ Financial Advisory and Intermediary Services Act (FAIS) 2004 - expanded the mandate of the FSB to include aspects of market conduct in the banking industry

Source: Financial Services Board

- ▶ The FSB is there to ensure that you are treated fairly by the financial services providers you deal with, and that you enjoy a safe investment environment.
- ▶ prevents many South Africans from losing their hard earned money to illegal money making schemes
- ▶ the FSB does not regulate or follow up on pyramid schemes, as the South African Reserve Bank takes on this responsibility
- ▶ the Financial Services Board (FSB) oversees the non-banking financial services industry, which includes:
  - ▶ retirement funds
  - ▶ short-term and long-term, and funeral insurance
  - ▶ collective investment schemes
  - ▶ financial advisors and brokers
  - ▶ brokers

Source: Financial Stability Board

# The National Credit Regulator (NCR)



- ▶ Established under the National Credit Act 34 of 2005.
- ▶ Responsible for the regulation of the South African credit industry.
- ▶ Tasked with carrying out education, research, policy development, registration of industry participants, investigation of complaints, and ensuring the enforcement of the Act.
- ▶ Promote the development of an accessible credit market, particularly to address the needs of historically disadvantaged persons, low income persons, and remote, isolated or low density communities.
- ▶ Registration of credit providers, credit bureaux and debt counsellors; and with the enforcement of compliance with the Act.

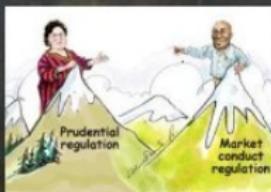
# The National Treasury



- ▶ Formed in 31 May 1910
- ▶ Manages national economic policy, prepares the South African government's annual budget and manages the government's finances

## Focus on South Africa - Legislation

# TWIN PEAKS



source: <https://www.linkedin.com/pulse/twin-peaks-double-whammy-south-african-financial-mohsien-hassim/>

## Twin Peaks

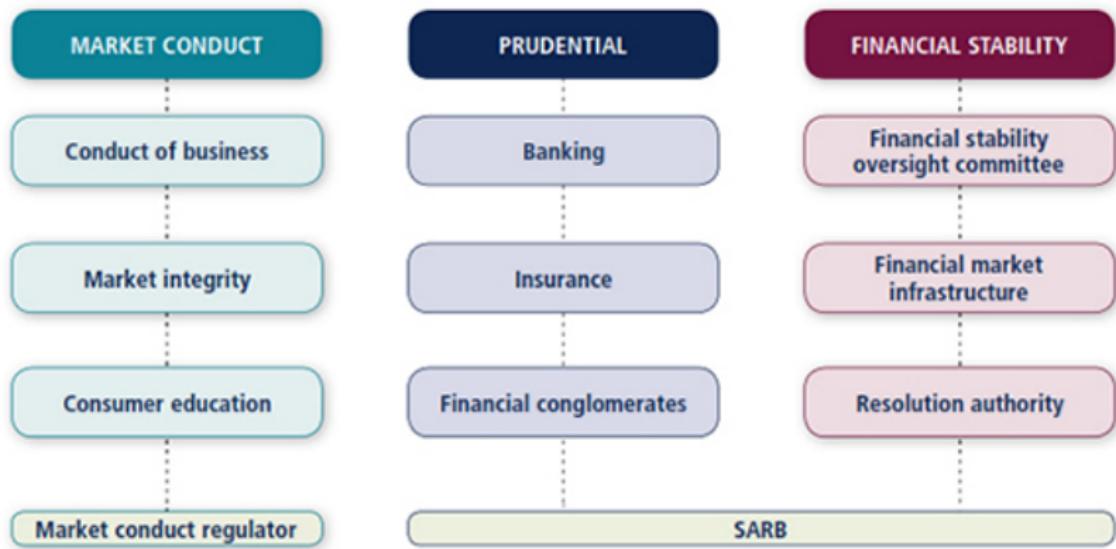
- ▶ Twin Peaks system signed into law by President Zuma on 21 August 2017
- ▶ South Africa is set to join the UK, Netherlands and Australia as being the only countries in the world to have the system.
- ▶ creation of a ‘prudential regulator’ – the Prudential Authority – housed in the South African Reserve Bank (SARB);
- ▶ the FSB will be transformed into a dedicated market conduct regulator – the Financial Sector Conduct Authority.
- ▶ SARB is expected to look over the insurance as well as the banking sector

REGULATORY ARBITRAGE REGULATORY CAPTURE REGULATORY FAILURE  
REGULATORY RISK RESIDUAL RISK **BALANCE OF PAYMENTS** BANK  
BASEL II AND III G-SIFIS BONDS BOUNDED RATIONALITY BRAND  
BRETON WOODS COMPETITIVE ADVANTAGE PROTECTIONISM EXCHANGE  
CONTROLS MOBILITY **GLOBALISATION** HOT MONEY INVESTMENT  
LIQUIDITY VOLATILE CAPITAL FLOWS DIVERSIFICATION ASSET PRICE BUBBLES  
ADVANCED ECONOMIES INFLATION **COST-EFFECTIVE** LIBERALISATION  
CONSUMER PROTECTION FINANCIAL SERVICES BOARD MARKET CONDUCT  
NEW GROWTH PATH ROSC G-20 CAPITAL ADEQUACY FSB SYSTEMIC  
RISKS FOREIGN CURRENCY FINANCIAL FREEDOM **GOOD DEBT** GOOD  
INVESTMENT **RESERVE BANK** ROSC G-20 CAPITAL ADEQUACY  
BONDS COMPOUND GROWTH BANK SOLVENCY II GREAT  
DEPRESSION(1930) **A SAFER FINANCIAL SECTOR** FSB  
EURO-ZONE RAND **TO SERVE SOUTH AFRICA BETTER** G-20  
SUBPRIME MORTGAGES SECURITISATION SOVEREIGN FINANCES **ECONOMIC**  
**RECOVERY** DEFLATION RISK-MANAGEMENT FOUR-PILLAR POLICY MONETARY  
POLICY IMF WORLD BANK CREDIT DERIVATIVE HEDGE MARKET  
FORCES MICRO PRUDENTIAL PRUDENTIAL REGULATION REGULATION  
REGULATORY ARBITRAGE REGULATORY CAPTURE REGULATORY FAILURE  
REGULATORY RISK BALANCE OF PAYMENTS BANK BASEL II AND III



**national treasury**

Department:  
National Treasury  
REPUBLIC OF SOUTH AFRICA



source: National Treasury

## Focus on South Africa - Deposit insurance

Source: Designing a deposit insurance scheme for South Africa - a discussion paper May 2017

Up to the beginning of 2015, South Africa was one of only three G20 countries without a DIS, the other two being China and Saudi Arabia. China implemented a DIS in May 2015 while Saudi Arabia announced the implementation of a DIS from 1 January 2016.<sup>6</sup> South Africa is thus currently the only G20 country that does not have explicit deposit protection in place.

Source: Designing a deposit insurance scheme for South Africa - a discussion paper May 2017

## Deposit insurance in South Africa

- ▶ Currently no explicit arrangements in place to protect depositors in the event of a bank failure
- ▶ in the past government compensated depositors for their losses on a case-by-case basis → taxpayers had to bear the cost of the failure of individual commercial enterprises, albeit indirectly
- ▶ there is uncertainty about which depositors should be compensated in the event of a bank failure, the amount such compensation should be, and where the funding should come from
- ▶ → the National Treasury and the SARB took an in-principle decision in 2015 that South Africa should establish a DIS to close the existing gap in its financial safety net and to also bring South Africa in line with international best practice and other G20 countries

- ▶ Paper released by SARB in May 2017 motivates the need for an explicit, privately funded deposit insurance scheme (DIS) for South Africa
- ▶ Main policy objective: protect less financially sophisticated depositors in the event of a bank failure
- ▶ but also...DIS can contribute to the development of a less concentrated banking sector and support financial inclusion and transformation of the sector
- ▶ DIS provides a mechanism to ensure a pre-planned, orderly and efficient provision of protection rather than an unprepared scrambling for funds

## DIS - proposed designed features

- ▶ DIS should be explicit and credible, The design of the DIS should not place an excessive cost on the banking system, distort the competitiveness in the banking sector, or cause moral hazard to the extent that it would become a threat to financial stability.
- ▶ protect covered deposits in the event of a bank failure
- ▶ DIS should have paybox-plus mandate, which would allow for the reimbursement of the covered deposits if a bank failed and which should also support other forms of resolution, provided that it would cost the DIS less than what it would have had to pay out in the event of a liquidation of a bank

## DIS - proposed designed features cont.

- ▶ DIS should be established as a subsidiary of the SARB - separate legal entity
- ▶ Membership should be compulsory and automatic for all registered banks; the DIS should be consulted whenever an application for a new banking licence is received.
- ▶ Qualifying deposits should include all the deposits held by banks, except the following categories
  - ▶ deposits by banks
  - ▶ deposits by the non-bank private financial sector
  - ▶ deposits by government
  - ▶ bearer deposit instruments (For example NCds and PNs)

## DIS - proposed designed features cont.

- ▶ All qualifying deposits should be covered up to R100 000 per depositor per bank
- ▶ Rules wrt deposit coverage
  - ▶ Foreign nationals' deposits and foreign currency deposits held at domestic branches of South African banks will be covered
  - ▶ Deposits covered on gross basis
  - ▶ Pooled accounts treated as single account
  - ▶ Joint accounts split equally
- ▶ SA should follow pre-funded approach, with the SARB providing the required liquidity in a payout and additional emergency funding in the event of shortfalls. The recommended target size for the fund is 5.0% of covered deposits, to be maintained on a continuous basis
- ▶ to alleviate the initial funding cost of the DIS, the SARB is willing to consider lowering the cash reserve requirement (CRR) from 2.5% to 2.0% of liabilities

## DIS - proposed designed features cont.

- ▶ where the funds of the DIS are not sufficient for the payout of deposits, the SARB will maintain a committed liquidity funding line to the DIS. Recoveries will take place afterwards.
- ▶ In the event of a bank failing, depositors will initially be paid out within 20 working days after the closure of the bank for accounts where ownership is easily identifiable. Ultimately, payouts should be done within 7 working days, in line with international best practice.

## Conclusion

## Some final thoughts

- ▶ Globally, financial systems are undergoing major structural changes - due partly to increased competition
- ▶ Regulatory arrangements have also changed and have become more complex
- ▶ In many countries a global dimension to regulation has emerged
- ▶ The tendency today is to harmonise national financial regulation with international standards
- ▶ In a rapidly changing market environment - traditional views about financial regulation should always be subject to scrutiny and challenge

Source: Financial Regulation in South Africa, Falkena *et al*, 2001

## Some final thoughts continued

- ▶ If the ultimate purpose of regulation is to protect the consumer and serve systemic interests, then it should be subjected to the test of whether it does so effectively and cost-efficiently
- ▶ arguments against particular mechanisms may not invalidate the arguments for regulation in general
- ▶ the rationale for all regulatory arrangements and structures needs to be clearly identified rather than taken for granted
- ▶ Therefore regulation should be an evolving process, responsive to changes in the market environment
- ▶ Regulation that remains stable irrespective of market changes will be inefficient at best, and perhaps even perverse.

Thank you!